STUDY ON THE MONOCOT FLORA OF MEGHALAYA

BY

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DEPARTMENT OF BOTANY

SCHOOL OF LIFE SCIENCES

Submitted in fulfilment of the requirement of the

Degree of Doctor of Philosophy

TO

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NOVEMBER, 1980.

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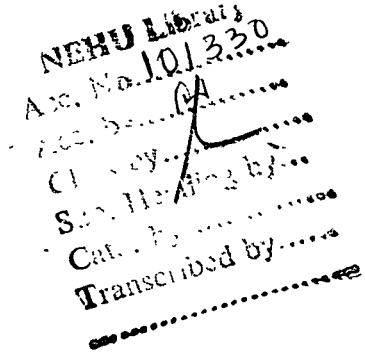

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I certify that the thesis entitled 'STUDY ON THE MONOCOT FLORA OF MECHALAYA' submitted by Sperliwell Myrthong for the degree of DOCTOR OF PHILOSOPHY of the North-Eastern Hill University embodies the record of the original investigation carried out by him under my supervision. He has been duly registered, and the thesis presented is worthy of being considered for the award of the Ph. D. Degree. This work has not been submitted for any degree of any other University.

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P R E F A C E

Publication of a regional Flora of Assam by Kanjilal and others (1934-1940) forms a land mark in the history of botanical studies in this region. But at the same time this has created an obvious gap in the study of Monocotyledonous flora. As a prelude to filling up this gap 'A MONOCOT FLORA OF THE STATE OF MEGHALAYA' is presented here based on extensive plant collections made during the period 1976-1980; and also on some old collections deposited in the herbarium of Botanical Survey of India, Shillong (ASSAM).

As the present flora forms the first and nearly a complete Monocot flora of Meghalaya, it is thought desirable to give detail descriptions of species on the same lines as that of the Flora of Assam, with the result, the bulk of the volumes could not be avoided.

In presenting this flora the system of Cronquist (1968) has been followed. With the limited available literature facilities accessible to the author the nomenclature of the taxa is checked but is by no means up-to-date.

Preparation of a flora of a state like Meghalaya, which is one of the richest botanical regions in the country, cannot be just one man's task and if so it is surely bound to have many short comings, omissions and mistakes, which the users of the flora (when it is formally published) will bring to the notice of the author.

It is hoped that this work will serve the growing needs of students, teachers, researchers and a number of others who are interested in plant resources not only in Meghalaya, but outside as well.

SPENLIWELL MYRTHONG.

INTRODUCTION

Meghalaya, one of the richest and interesting ' botanical provinces ' of the Indian subcontinent is still floristically incompletely known, and has no flora of its own. Nevertheless, this is one of the botanical regions which has attracted the attention of a large number of well known botanists (Buchanan-Hamilton, 1820; Roxburgh, 1820-24; Griffith, 1837; Hooker, 1855; 1872-97; Fischer, 1925; Hooker & Thomson 1851; Burkill, 1925; Bor, 1940, 1960). After the reorganisation of the Botanical Survey of India, and with the establishment of a separate regional circle at Shillong, this part along with entire North-Eastern India has received considerable attention and a few significant contributions have been made (Naik & Panigrahi, 1961; Joseph, 1968; Rao & Verma 1970, 72, 73; Verma, 1971; Balakrishnan, 1971). But, inspite of all these studies a comprehensive flora of the State remains to be worked out. The only existing regional account of the Flora is that of Kanjilal et al (1934-40), which is firstly incomplete where a section of the flowering plants, namely Monocotyledons have not been dealt (except a solitary family-Gramineae by N.L.Bor, 1940), and secondly, it has a strong bias towards the woody forest flora. Further, subsequent to the publication of this regional flora (Kanjilal et al., 1934-40) there has been a large scale alteration in the native flora of the state, owing to the practice of the so called 'Jhumming' or shifting cultivation. Thus it is felt that inspite of the merits noticable in it, this regional flora is inadequate even for the dicotyledonous species as far as the

Meghalayan region is concerned.

The state of Meghalaya (which earlier formed part of Assam) supports a dense natural cover of forests probably because of its climatic and physical features. Hooker (1905) describes the vegetation of Khasia hills in Meghalaya as '' the richest in India and probably in the whole of Asia''. He was able to collect about 2,000 flowering plants alone within ten miles of the station Cherrapunjee. But this rich natural cover of forests is being depleted extensively and species which were quite dominant once are rendered endangered or even have been completely exterminated from the area. This is mainly because of the destruction of original habitats of these species. Orchids are just one group to mention here in this regard.

It is not only essential but worth recording the plant species of the state before we are left with barren grass-covered hills devoid of any luxuriant vegetation. Besides, basic information in this line is highly essential for any state for full exploitation of the natural resources.

Thus, keeping in view the strong need for a '<u>Flora of Meghalaya</u>' an attempt has been made in this study to bring out a 'Monocotyledons flora of Meghalaya'. 736 species under 298 genera and 35 families are treated in this flora following the system of Cronquist (1968).

MAP OF MEGHALAYA SHOWING LOCALITIES OF PLANT COLLECTION.

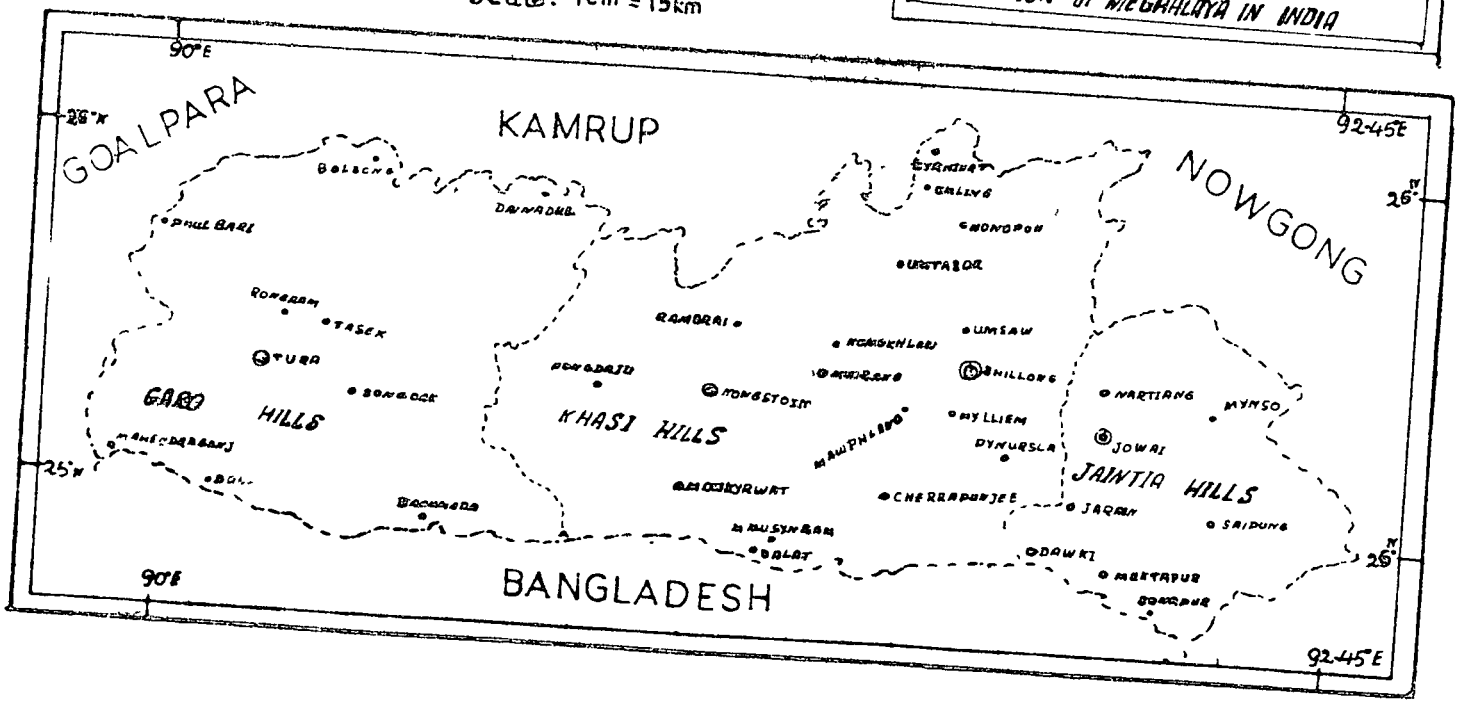
International boundary ----------

State boundary - - - - -

District boundary ------

District Hq. ◎

Scale: 1cm = 15km



GEOGRAPHICAL FEATURES

The State of Meghalaya comprising of West Garo, East Garo, West Khasi, East Khasi and Jaintia Hill districts, which earlier formed part of Assam, came into existence on 19th January, 1972. The area of the state as of date is 22,549 sq.km. It lies between 25°47' and 26°10' North latitude and 89°45' and 92°47' East longitude. It is bordered on the north-west, north-east, and south-east by the State of Assam and to the south-west by Bangladesh(Fig.1). The State presents a picturesque landscape of plateaus, ravines, brooks, rivulets, lakes and waterfalls. The altitude varies from 600 to 1950 m with the highest peak, known as the Shillong Peak, lying in the Shillong plateau of Khasi Hills.

PHYSIOGRAPHY AND DRAINAGE PATTERN

The physiographic characteristic of the region is remarkable due to the highly dissected and irregular terrain in the western and northern faces, in contrast to the regular and steep fall of the southern face to Barrak. The interesting physiographic feature in the north is that the boundary of the plateau is not well defined.

Physiographically, Meghalaya represents a remnant of ancient plateau of the precambrian Indian peninsular shield, the block uplifted to its present height. The kernel of the plateau

is the exposed Archaean gneisses and schists covered in the central and eastern parts by precambrian quartizites and phyllites.

The ancient peneplaned surface of the plateau is still preserved with marks of different cycles of denudation in the central and northern parts; it is hidden beneath the mesozoic traps along the central southern fringe, and cretaceous-tertiary sediments over the southern, south-eastern and south-western parts. The plateau, standing as a watershed between the Surma valley of Bangladesh on the South and the Brahmaputra valley on the north, is dissected by several rivers and a network of their tributaries and lateral streams.

The western part, i.e. Garo Hills is an extensively dissected tract with an average elevation of 600 m or less. The most important physiographic features of Garo Hills are the Tura range and Simsang valley. The Tura range runs almost through the centre of Garo Hills due to east-west extension from Tura town to Siju.

The drainage pattern in the region represents a most spectacular feature revealing extraordinary straight courses of rivers and streams, evidently along joints and faults. The magnificient gorges scooped out by the rivers in the southern Khasi and Jaintia Hills are the result of massive headward erosion by antecedent streams, along joints and sedimentary rocks over the

block experiencing relatively greater uplift. Westward, in the Garo Hills, the consequent streams are mostly controlled by the structural faults and monoclines in the sedimentary rocks. The northern part of the plateau devoid of any sedimentary cover, is marked by a long incisive valley, formed due to headward erosion along joints in the gneissic rock and granites. The limestone-covered country over the southern Garo, Khasi and Jaintia Hills represents a typical karst topography. The present physiographic configuration of the plateau was attained through different geological events since the mesozoic period to the present day as indicated by the polycyclic erosional surfaces at various levels.

GEOLOGY AND SOIL

Geologically, the state of Meghalaya is characterised by (a) Archaean gneissic complex with acid and basic intrusives (b) Shillong groups of rocks (c) Lower Gondwana rocks (d) Sylhet traps and (e) Cretaceous-tertiary sediments.

The Archaean gneissic complex is exposed in the central and northern parts of Meghalaya. They comprise mainly biotite gneiss, biotite granulite, amphibolite, calc-granulite, banded magnetite quartzite, sapphirine-cordierite granulite, magnetite-grunerite, granulite, quartz-demeritierite-tourmaline schist, etc. Some of the schistose rocks comprising bilite-schist, quartz-sillimanite schist, metabisate, biotite-cordierite

granulite, red schist, etc., occur as detached remnants over the older gneissic complex around Suhapahar. Possible unconformity has recently been postulated between these two groups of rocks.

The mafic rocks within the Archaeans include orthoamphibolite, meta-dolerite and meta-pyroxenite. They show mostly concordant and partly discordant relationship with the associated gneisses.

The Shillong Groups of rocks comprising quartzite, usually friable, with subordinate phyllite, quartz-sericite schist, conglomerate, etc. are exposed in the central and eastern parts of the Meghalaya plateau. Current bedding is commonly noticed in these rocks which generally strike in a NE-SW direction. These rocks are intruded by ultramafic and acidic sills and dykes. The basic and ultramafic intrusives are represented by epidiorite, dolerite, amphibolite, pyroxenite, etc. The lower Gondwana rocks in the Garo Hills, consists of pebble bed, sandstones and carbonaceous shale with streaks and lenses of coal.

The Sylhet Traps are of the nature of plateau (flood) Basalts, exposed in a narrow E-W strip, 80 km long and 4 km wide along the southern border of the Shillong plateau. They apparently overlie the eroded Precambrian basement and are themselves overlying unconformably by the Upper Cretaceous Eocene sediments. The sediments and the lavas form a monocline, becoming a fixture southwards, and have been subsequently eroded at places exposing

the traps as inliers. To the north the traps at Therriaghat are in contact with the gneissess, granites or Shillong Group of rocks along an E.W. fault, termed the Raibah fault.

The Cretaceous-Tertiary Sediments occupying the southern part of the Meghalaya plateau are thick and extensive and are considered to be physically continuous with the Cretaceous-Tertiary sediments of the Bengal basin. These sediments are affected mostly by basement controlled faults.

The sediments are mainly sandstone and shale (mudstone), excepting for the three well defined fossiliferrous limestone horizons. They occur as discrete outliers and as continuous narrow belt fringing the southern margin of the state bordering the Bangladesh plains.

The oldest formation of the upper Tertiary sediments (viz. Garo Group) is represented in Garo Hills by the Simsang formation which conformably overlies the Kopili formation without any break in sedimentation. The Simsang formation consists of cycle of massive festoon cross-bedded sand, alternating with siltstone sandstone units.

The Baghmara formation conformably overlies the Simsang formation in the eastern part of the plateau. It consists of irregular beds of coarse felspathic sand with minor mudstone streaks, pebbly conglomerate, massive clay and silty clay beds,

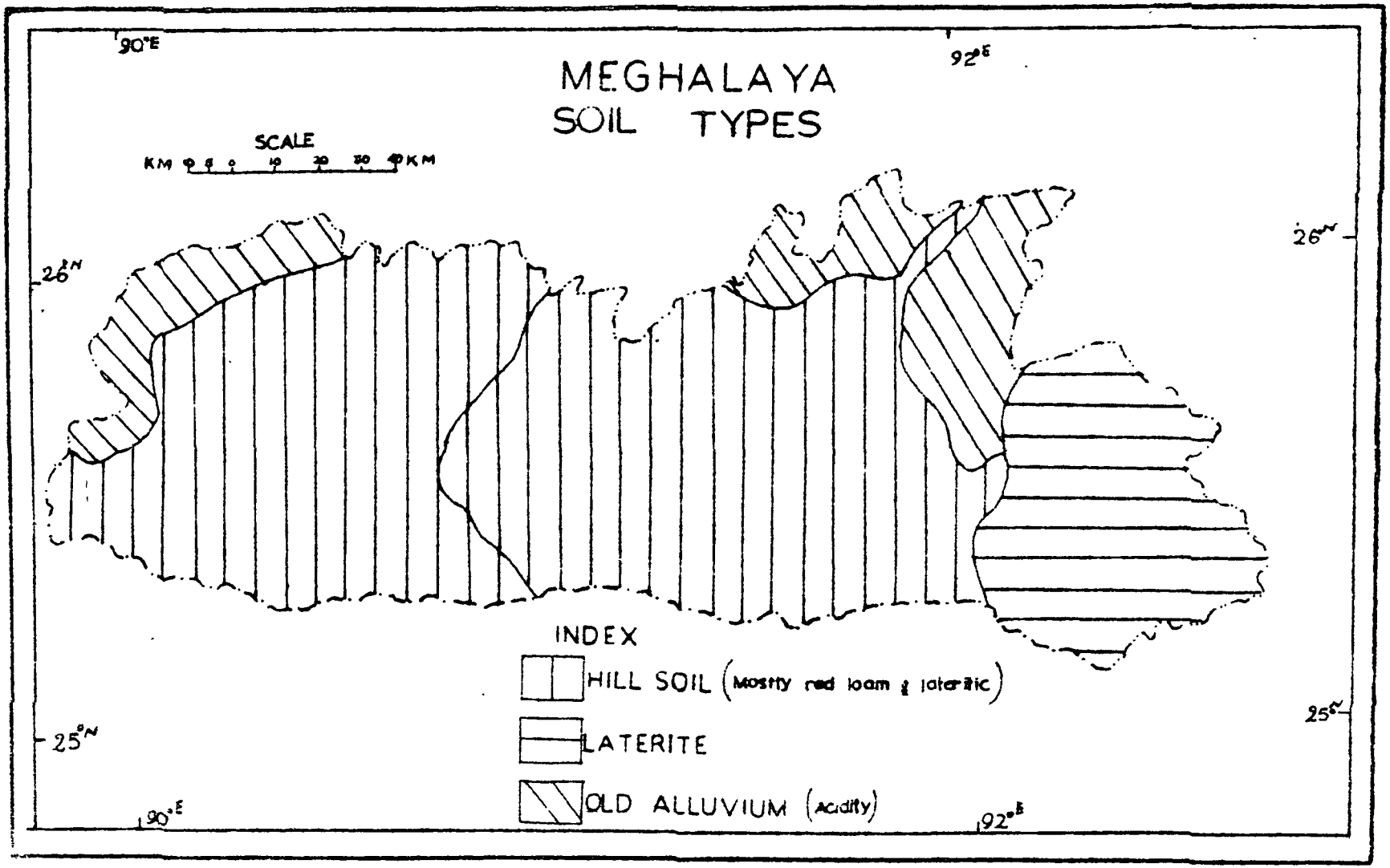

MEGHALAYA
SOIL TYPES
SCALE
KM 0 5 0 10 20 30 40 KM
90°E
92°E
26°N
25°N
INDEX
HILL SOIL (Mostly red loam & lateritic)
LATERITE
OLD ALLUVIUM (Acidity)

Fig. 2.

and thin alternating beds of mudstone and fine sand. Near Tura-Dalu road in Garo Hills, the entire Simsang formation shows a sharp change in faces equivalent of the Simsang formation.

The Chengapara formation, overlying conformably the Baghmara formation consists of poorly cemented, fine-grained, micaceous sand blue to brown siltstone and clays with a few thin marly beds at its base. At the top of the Bagmara formation and at the base of the Chengapara formation, a fossiliferous calcareous siltstone horizon can be traced from near Baghmara to a few kilometers west of Barengapara.

Soils:-

The soils vary all over the Meghalaya plateau, both in physical characters as well as fertility conditions. In most places the amount of loose soils is very scanty. The soils are mostly lateritic in origin and vary from sandy loam-red, loam to clay loam (Fig. 2). The soils in plains are comparatively more fertile than the upland soils since much of the bases and organic matter from top soils get washed down due to high rainfall. The broad types of soils are as follows:-

Laterite soils:-

This type of soil is derived directly from the residuary basic and intermediate igneous rocks produced by the weathering in hot climates. These soils are deficient in potash, phosphoric acid and lime.

Ferruginous red soil (old or alluvium):-

These soils are poor in lime, potash and iron oxide and also uniformly low in phosphorous content. They are generally poorer in nitrogen, phosphorous and humus. Throughout the range the red soils differ greatly in depth and soil fertility, which under irrigation, produce a large variety of crops. The clay fraction of the red soils is rich in Kaolinitic type and is suitable for cultivation, specially for paddy, and other crops.

Mountain and Hill soils:-

Here the percentage of organic carbon of the surface soil varies from 1 to 3, and the pH of the surface soil is between 4.5-6.5. These are mostly red loams and lateritic in origin. As it is evident from Fig. 2. This is the most predominant type of soil in Meghalaya.

CLIMATE OF MEGHALAYA

The climate of this region differs from that of the Brahmaputra valley mainly due to its high relief, which, in general makes the climate very salubrious; while that of the Brahmaputra plain is comparatively warmer in summer and cool in winter. However, the climate of the central part of the central and eastern Meghalaya (Khasi and Jaintia Hills) is conducive, whereas western part of Meghalaya (Garo Hills) except for the winter (November and February) becomes oppressive as a result of high temperature

Table - 1

TEMPERATURE (^{o}C) RECORD FOR MEGHALAYA

	1976		1977		1978		AVERAGE	
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
JANURAY	14.0	5.0	15.1	5.4	13.4	4.5	14.1	5.2
FEBRUARY	17.0	7.9	17.9	7.8	15.2	6.8	16.8	7.5
MARCH	22.4	11.8	23.4	12.6	21.3	10.3	23.6	11.5
APRIL	24.1	14.5	21.7	12.7	23.8	13.0	23.1	10.06
MAY	22.9	14.8	21.9	14.2	23.1	16.6	23.6	15.2
JUNE	22.1	16.6	23.0	16.6	22.4	13.6	23.5	15.6
JULY	23.5	17.3	24.2	18.1	23.8	13.2	23.8	16.2
AUGUST	23.1	17.1	24.3	17.7	25.0	18.3	24.01	17.3
SEPTEMBER	23.6	13.9	23.0	16.6	23.1	16.6	23.2	15.7
OCTOBER	21.3	13.3	20.7	13.2	22.4	15.2	21.4	13.9
NOVEMBER	18.6	10.9	18.5	12.1	18.5	10.3	18.5	11.1
DECEMBER	15.5	6.5	15.1	6.7	17.8	7.4	16.1	6.8

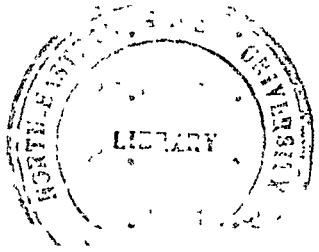


Table - 2

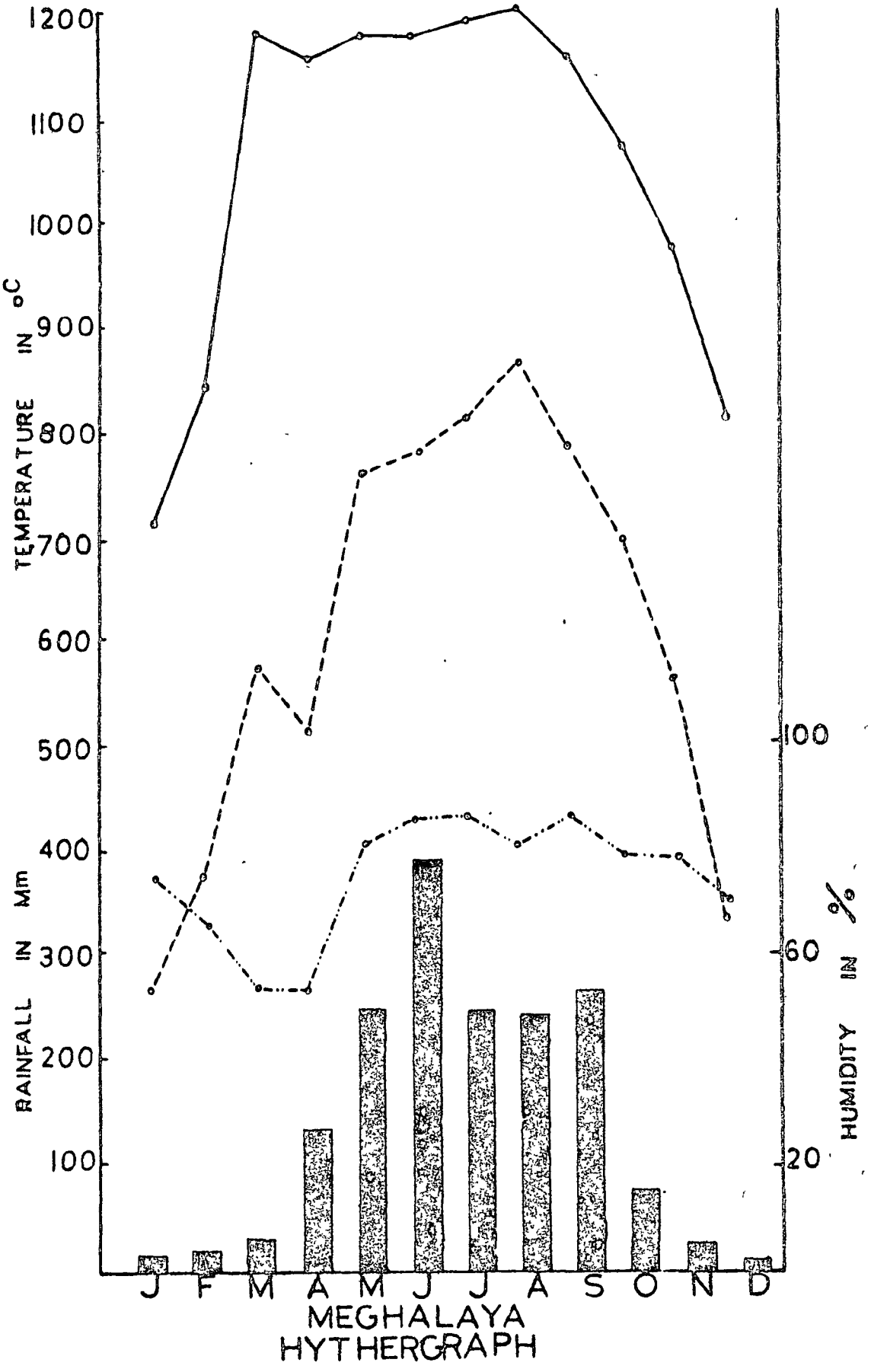
RA RAINFALL (mm) DATA FOR MEGHALAYA

	1976	1977	1978	AVERAGE
JANUARY	20.9	1.4	00.0	7.4
FEBRUARY	12.2	2.3	17.7	10.7
MARCH	9.2	44.2	34.9	29.4
APRIL	45.2	266.5	84.4	132.02
MAY	211.0	453.4	208.3	290.09
JUNE	408.2	310.7	460.1	393.00
JULY	322.0	270.0	245.2	245.7
AUGUST	215.1	319.8	193.0	242.6
SEPTEMBER	158.5	279.4	246.4	268.15
OCTOBER	53.0	127.4	50.6	77.0
NOVEMBER	3.6	50.3	20.4	24.7
DECEMBER	0.2	25.0	00.0	8.4

Table - 3

MONTHLY MEAN RELATIVE HUMIDITY (%) FOR MEGHALAYA

	1976		1977		1978		
	HOURS		HOURS		HOURS		
	08.30	17.30	08.30	17.30	08.30	17.30	AVERAGE
JANUARY	69	85	60	83	60	88	74.1
FEBRUARY	63	72	57	72	52	79	65.8
MARCH	48	60	51	63	49	52	53.3
APRIL	55	64	77	82	57	37	62.0
MAY	71	81	77	87	79	86	80.1
JUNE	87	89	86	85	84	88	86.5
JULY	85	87	87	88	86	88	86.5
AUGUST	81	88	85	88	82	86	85.0
SEPTEMBER	79	88	76	91	86	91	86.8
OCTOBER	63	87	72	90	70	90	78.5
NOVEMBER	75	88	71	90	64	85	78.5
DECEMBER	60	90	60	88	40	84	73.3



MEGHALAYA
HYTHERGRAPH

BASED ON AVERAGE OF 1976 - 1978

and heavy rainfall, rendering the atmosphere exceedingly steamy, although the temperature is slightly moderated by copious rainfall

A relatively low elevation of the Western Meghalaya is responsible for a fairly high temperature for the most part of the year, i.e. from February to October with April as the hottest month (Fig. 3) having the mean maximum and mean minimum as 24.01°C and 17.3°C respectively. The month of June shows the highest average rainfall (393 mm) and month of July shows the second highest average temperature record for 3 years. The average annual rainfall in western Meghalaya is 2,689 mm, of which more than two-thirds are received in the four months. May-August. Winter is conspicuously dry with rainfall less than 50 mm in four months, November-February. The rainfall decreases from south to north as the moisture bearing winds strike the southern part first causing heavy downpour, while the central Tura range obstructs their path to north. The average annual rainfall in south-east is above 4,000 mm, whereas in the north it is between 2,500 to 3,000 mm.

The climate of the central and eastern Meghalaya is bracing due to the high altitude. But at the foot hills of the southern slopes and sub-montane regions in the north and east the climate is slightly humid and warm. In Shillong region winter temperature goes down to about 5.2°C and seldom rises above 26°C in any part of the year. During deep winter (December-January) one usually experiences heavy frost in Shillong plateau although snowfall is not experienced in the area. The most interesting climatic feature of this part is the very high rainfall with an average annual of

7,196 mm which distinguishes this area climatically from the other parts of Meghalaya. However, there is great variation of rainfall within this region from South to North. This is primarily because the higher part i.e. the central Upland Zone having an E-W alignment renders a rain shadow effect on the areas lying to the north. Consequently, the rainfall in Cherrapunjee which is located in the structural platform on the south is as high as 12,033 mm, while Shillong being located only 50 km to the north with a rain-shadow effect gets only 2,296 mm. Mawsynram, a village situated on a similar plateau as the Cherra plateau, about 16 km west to Cherrapunjee records the highest rainfall in the world with 13,923 mm (based on the recent average). The highest rainfall in Cherrapunjee and Mawsynram region is due to the fact that south-west monsoon laden clouds with great amount of moisture from the Bay blows over Bangladesh and is suddenly cut by the cliff of the tableland in the south with an average elevation above 1,200 m and as a result the monsoon, having reached the heads of the gorges ascends vertically upwards and causes very heavy rainfall. Jowai which is located on the ridge of the eastern section of the central upland receives the greater amount of rainfall than Shillong with 3,0077 mm as it does not experience a rainshadow effect. This figure however is much below the average for Khasi and Jaintia Hills mainly due to the high rainfall figures in Mawsynram-Cherrapunjee region (12,000 to 13,000 mm). The rainfall decreases further north due to significant rain-shadow effect and as such the northern slopes experience 1,270 mm to 2,032 mm rainfall.

The meteorological data for Meghalaya for the years 1976-1978 are produced in the tables 1-3, which give a clear picture of the climate of the area in general*.

HISTORICAL ACCOUNT OF THE REGION

There is no integrated historical account of the Region, since it is occupied by different tribal groups which have till recently lived in physical isolation and have no script of their own. However, there are some references about them in 'Buranjis' of the Ahoms and the historical records of last century based on Ahom chronicles supplemented particularly on the Khasis, Jaintias, Mikirs and Cacharis, Which provide some evidence of occupation of its northern fringe even before the Christian era. There is no evidence of prehistoric settlement of the region except for the recent claim by some scholars that the Rongram Valley of the Garo Hills was inhabited in the Paleolithic times, based on their findings in the Daojali having excavation site of the said Valley.

Historical accounts suggest that there were waves of migrations into North-Eastern India through the North-Eastern [illegible] routes and these migrations were rather invaders who belonged to the 'Indo-chinese linguistic family' of which two most important sub-families are the 'Mon Khmer' and 'Tibeto Burman'.

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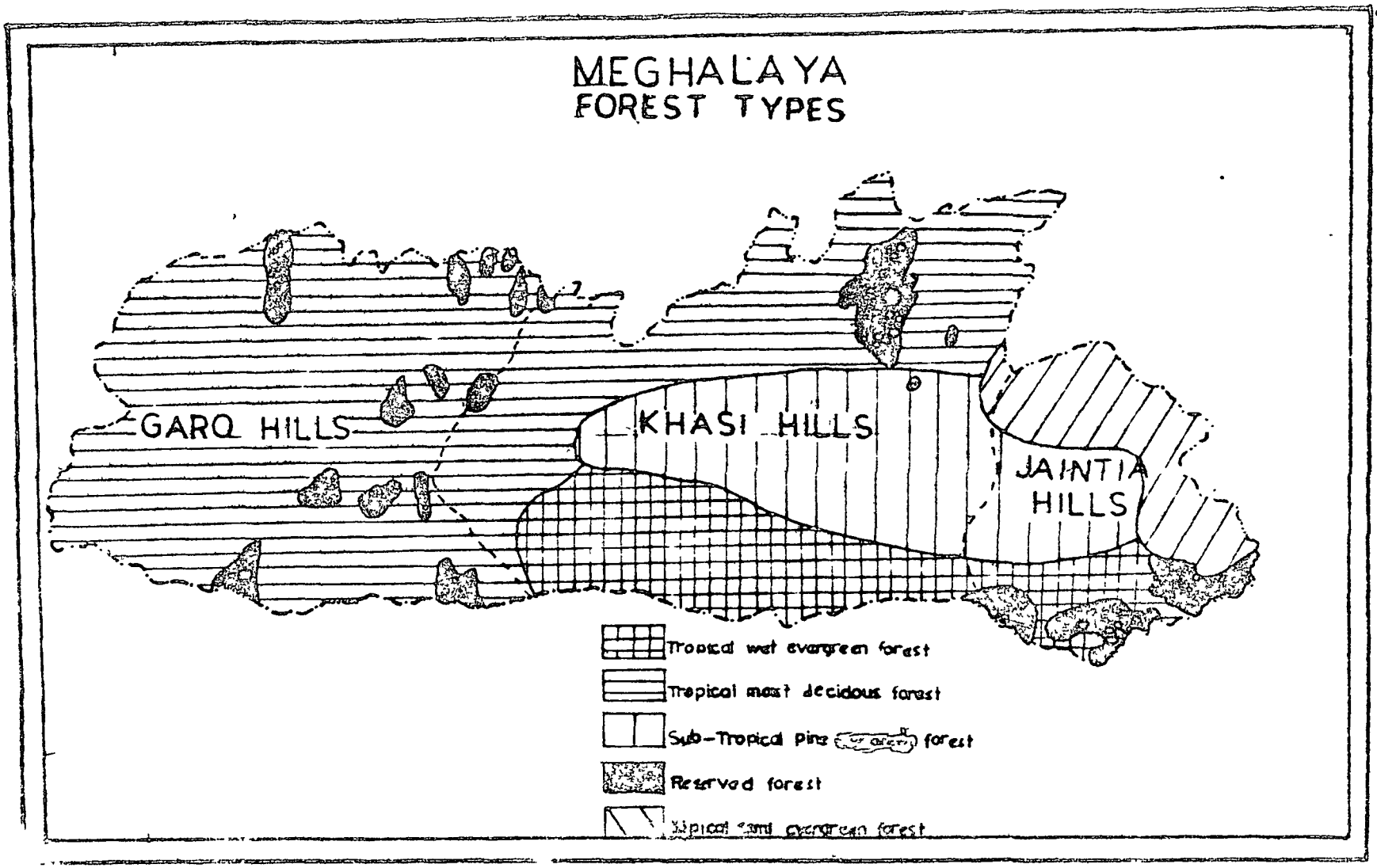
*The climatic data charts have been provided by the Meteorological Office, Shillong, and their use in this study is gratefully acknowledged.

The 'Mon Khmer' which constitutes the Khasis and Jaintias was driven by subsequent 'Tibeto Burman' invaders into the Khasi Hills which is the only part of North-Eastern India in which the sub-families there were three groups namely Naga, Kuki, Chin and Bodo. The Naga and the Kuki were driven into hills in the North-east and the Bodo dominated into the plains, the Garo hills and the north Cachar Hills. It is said that the Garos and the Kacharis were originally gelonged one tribe, and subsequently separated into two- the Kachari on the north bank, and the Garos over the south bank of the river Brahmaputra.

As regards the history of Garos practically nothing is known. They are still primitive. The history of the Khasis and the Jaintias may be traced from the early part of 18th century only, because prior to this, there is no record or tradition that they were owed allegiance to a single prince. After studying the etymological aspect of the name Khasi it gives an idea that 'Kha' means water course in a river or a lake or a spring and chai also means blood, and 'chai-kha' or 'kha-chai' means bloody water. The people living by the side of the spring from which reddish water oozed out were the 'Kha-chias' and they are later known as Khasias or Khasis. When they first emerged from obscurity, they were split into numerous communities each under its own head. The most well known in the 16th and 18th centuries are only the Jaintia Raja (Kings) and to some extent the Syiem (Raja or Chief) of Khyrim in the Khasi Hills. The Khasis previously had been known only as troublesome plunders upon the plains of Sylhet. A line of

forts was kept up under the hills to check their incursions. The Khasi Hills came under the British in 1883 with the submission of the last of the important Syiems, Tirot Singh. The Khasis were a religious sect, looking after the holy shrine, while the Jaintias were the ruling class and therefore the chief headman or the Rajah was selected from Jaintias. The post of a headman over a group was elective, whereas the post of Rajahs was a hereditary and the Rajahs were female, the youngest daughter of the previous ruler inheriting the throne.

Coming from China, the first home-land of paddy the Zuh, these people introduced the cultivation of paddy for the first time in this part of India. They however, continued the practice of cultivating arum roots, tumeric, etc., by picking up the high land with a pointed iron implement like a hoe called the Mohkhiew and this type of cultivation. 'Zuh-Moh' or the jhum cultivation, which is prevalent even today in most parts of Meghalaya. The rice beer which these people used as an invigorating drink also was known as the Zuh meaning the heavenly drink.


MEGHALAYA
FOREST TYPES
GARO HILLS
KHASI HILLS
JAINTIA HILLS
Tropical wet evergreen forest
Tropical moist deciduous forest
Sub-Tropical pine forest
Reserved forest

GENERAL ACCOUNT OF THE FOREST TYPES OF MEGHALAYA

The richness of the vegetational covering of North-Eastern India including Meghalaya is well known and has been studied by various botanists and foresters (Hooker, 1854, 1872-97, 1906; Griffith, 1847; Clarke, 1889; Bor, 1938; Biswas, 1941, 1943; Kingdon Ward, 1960; Das 1942; Burkill, 1925; Fischer, 1938; Deb, 1960; Kanjilal *et al*, 1934-40; Champion, 1936; Rowntree, 1953; Rao & Panigrahi, 1961; Rao, 1974). Various types of forests are met with in Meghalaya and each type is again characterised by a profusion and variety of species. Hooker (1906) describes the vegetation of Khasi Hills in Meghalaya as ' the richest in India and probably in the whole of Asia'. Phytogeographically the vegetation of this area is very interesting having an admixure of Asiatic and Indian peninsular floras. This great diversity and richness of floras is mainly due to its physical geography couple with varied nature of rainfall, temperature, and altitude. The forests of Meghalaya can broadly be classified under (a) The Tropical type (b) The Temperate type.

(a) TROPICAL FORESTS:

The tropical forests are met within areas between 900 to 1,800 m and comprises of evergreen and semi-evergreen forests, moist and dry deciduous forests, grasslands, subtropical mixed forests and subtropical pine forests, the latter chiefly confine to Khasi and Jaintia Hills of Meghalaya.

Evergreen and semi-evergreen forests:

These forests are confined to lower elevations of Khasi and Jaintia Hills, and in parts of Garo Hills. The rainfall is generally very heavy. The forests are characterised by dense and impenetrable vegetation chiefly comprising of tall, evergreen trees showing storied nature. Climbers and lianas are very common in these forests.

The highest storey consists of very tall trees belonging to Dipterocarpus turbinatus, Mesua ferrea, Castanopsis indica, Dysoxylum procerum, Schima wallichii, Pterospermum acerifolium, Quercus spicata, Sterculia villosa, and Terminalia chebula, form the dominant species in the foothills. These tall trees are bestowed with innumerable climbers and lianas, belonging to species Bauhinia vahlii, Derris scandens, Gnetum ula, Entada scandens, Calamus floribundus, etc. Epiphytes in general are too numerous and mostly belong to Orchidaceae, ferns and mosses. The important orchids which are worth mentioning here are Dendrobium longicornu, D. clavatum, D. formosum, D. aggregatum, D. moschatum, D. nobile, D. densiflorum, D. chrysanthum, Otochilus fuscus, Coelogyne ovalis, Neogyne gardneriana, Pholidota imbricata, Eria coronaria, E. flava, Cymbidium elegans, Aerides multiflorum, A. odoratum, Bulbophylum affine, B. striatum, B. reptans, Ione candida, Vanda caerulea, etc.

The herbaceous monsoon flora of these forests is very rich and form a striking feature when in blooms. The chief among them are Impatiens bicolor, Ageratum conyzoides, Richardsonia pilosa,

and various monocotyledonous plants such as Curcuma angustifolia, Amomum aromaticum, Curcomorpha longiflora, Phrynium capitatum, Costus speciosus, Hedychium spicatum, H. ellipticum, Murdannia nudiflora, Disporum cantonensis, Polygonatum oppositifolium, Peristylus goodyeroides, Arisaema album, Carex baccans, Scleria terrestris, Cyperus diffusus, Homalomena rubens pendula, Chlorophytum arundinaceum, Dracaena spicata, D. angustifolia, Acroceras tonkinense, Ottochloa nodusa, Setaria palmifolia etc. The stems clasping epiphytes of Araceaen members such as Pothos scandens, Rhaphidophora glauca, R. lancifolia, R. decursiva, are also not uncommon in these forests. Fern flora, both epiphytic and terrestrial is also very rich in this type of forest. In places like Lailad, Sunapahar, Markasa, Cherrapunjee of Khasi Hills, Jowai, Narpuh, Raliang, Garumpani of Jaintia Hills and Tura peak, Baghmara of Garo Hills tree ferns are very common.

Tropical moist and dry deciduous forests:

Annual shedding of leaves and recurring forest fires are the two important features of these deciduous forests. Majority of the trees here shed their leaves during November to February.

These forests are much disturbed and include such economically important species as Shorea robusta, Tectona grandis, Aprosa wallichii, Sterculia villosa, Elaeocarpus floribundus, and others both as natural and as plantations. The principal trees in these forests are Careya arborea, Gmelina arborea, Bombax ceiba, Terminalia bellerica, Dillenia pentagyna, Kydia calycina, Albizzia

lebbek, etc. Compared to evergreen forests the climbers are very few here and belong to Vitaceae, Menispermaceae and Papilionaceae. Most of these deciduous forests merge into 'Savanna' forests in some places. The typical grass species here are Saccharum rufipilum, S. arundinaceum, Themeda villosa, T. triandra, Narenga porphyrocoma, Polytoca walliana, Thyrsia zea, Vetiveria zizanioides, Imperata cylindrica, Panicum psilopodium, Sacciolepis indica, Ischaemum hirsutum, Arundinella bengalensis, Eragrostis nigra, E. gangetica, Axonopus compressus, Setaria glauca, etc., and many Zingiberaceae members such as Costus speciosus, Hedychium coccineum, etc. However, it should be noted that not all these species occur at one given place. Few scattered trees in these grasslands belong to Antidesma nigrescens, Artocarpus chaplasha, Lagerstroemia parviflora, Callicarpa arborescens, etc. Many of these Savannas are not climax types since the climatic and edaphic conditions in these areas supported either moist deciduous or evergreen forests which are degraded to the present grasslands.

The recurring forest fires in these deciduous forests have a devastating effect on vegetation, destroying the seedlings of trees and shrubs and perennating organs such as tubers, corms, bulbils, etc.

A major portion of forests in Meghalaya belong to this category, and can be seen around Burnihat, Umsning of Khasi Hills and on the way to Tura, Tasak, Rongjeng etc. of Garo Hills. Deciduous forests are very rare in Jaintia Hills.

Bamboo clumps or patches of bamboo forests are commonly noticed in places where the original forests are much disturbed. These bamboo forests generally come up in 20-25 years old fallows. Few dominant species of bamboo in Meghalaya are Dendrocalamus hamiltonii, D. hookeri, Bambusa pallida, etc. These species are associated with a variety of plants such as Smilax ferox, Rubia cordifolia, Vigna vexillata, Millettia piscidia, Dioscorea bulbifera, Paris polyphylla, Peristylus goodyeroides and various sedges and grasses.

Sub-tropical pine forests:

This type of forest is mainly confined to areas of Khasi and Jaintia hills. Pinus kesiya forms the dominant species here. In some places these pine trees are intermixed with trees belonging to Schima wallichii, S. khasiana, Myrica esculenta, Acacia mollisima, Alnus nepalensis, Quercus griffithii, Engelhardtia spicata, Rhus semialata, etc. These pine forests also provide shelter for a variety of herbaceous species underneath. Chief among them are Trifolium repens, Osbeckia crinita, O. glauca, Hypochaeris radicata, Artimisia artimisifolia, Senecio parviflora, Inula cappa, Gaultheria fragrantissima, Phyllanthus glauca, Brunella vulgaris, Scutellaria khasiana, etc. In the higher elevations the ground flora is dominated by Eupatorium adenophorum and E. riparium, while E. odoratum is the dominant species in lower elevations. Aegnitia indica a curious member of Orobanchaceae is also common in some places among pine litters. Among the monocotyledonous

species Imperata cylindrica, Arundinella bengalensis, Brachiaria villosa, Isachne albens, I. himalaica, Axonopus compressus, Carex cruciata, Fimbristylis dichotema, Murdannia nudiflora, Cyanotis vaga, Commelina palludosa, Arisaema consanguineum, A. tortuosum, are common. A large variety of ferns forming dense patches under these forests are also noticed. (Rao & Kharkongor, 1978).

(b) TEMPERATE FORESTS

The temperate forests are confined to elevations from 1,800 to 2,500 m and occurs only in Shillong plateau. Species like Juglans regia, Rhododendron arboreum, Quercus griffithii, Betula alnoides and Manglietia caveana characterise these forests.

The relic vegetation in some 'Sacred forests' like 'Lawkyntang' at Mawsmai, 'Lawlyngdoh' at Mawphlang of Khasi hills represent the true temperate vegetation and which once probably covered the entire area and is now considerably degraded due to human activities. Comparative studies on the vegetation of these Sacred forests with that of adjacent areas give us an indication of the extent to which these forests are degraded. Also much of these forests are now replaced by pine forests, mainly due to human activities from the prehistoric times. The trees in these Sacred forests mainly belong to Quercus griffithii, Castanopsis hystrix, Photinia notoniana, Eriobotrya japonica, Engelhardtia spicata, Mahonia tintoria, etc. The branches of these trees are heavily moss laden and support a dense growth of Orchids and ferns (Plate 115). The forest floor is covered with a thick mat of

litter among which various herbaceous species such as Peristylus densus, Spiranthes lancea, Herminium angustifolium, Calanthe mannii, Phajus longipes, Disporum cantonense, Arisaema album, Balanophora dioica, etc., are common. The epiphytic species are Rhaphidophora glauca, R. decursiva, R. lancifolia, Dendrobium longicornu, Thunia alba, Otochilus fuscus, Oberonia mannii, Eria coronaria, E. flava. A large variety of climbers such as Similax quadrata, S. perfoliata, etc., are also common here.

In many places these forested areas are rendered to grasslands following severe deforestation activities. The rolling grasslands covering large areas can be noticed around Riangdo, Ranikor, Wahliewlong, Mawphlang, Nongkrem, etc. of Khasi hills, and Sutnga, Garumpani, Nartiang etc. in Jaintia hills. In Garo hills as a result of jhumming most of the forest covered hills are brought down to grass covered hills, which one can commonly notice. The dominant grasses in these grasslands are Saccharum spontaneum, S. arundinaceum, Neyraudia reynaudiana, Thysanolaena maxima, Chrysopogon aciculatus, Narenga porphyrocoma, Panicum atrosanguineum, P. khasianum, Setaria glauca, Oplismenus compositus, Axonopus compressus, etc. These grasses are associated with sedges like Mariscus sumatrensis, Fimbristylis dichotoma, Cyperus zollingerei, C. tuberosus, Scleria terrestris and some Eriocaulaceae members such as Eriocaulon cristatum and E. brownianum.

Apart from giving a green look to these barren hills these grasses also support other dicotyledonous species like Eriosema

chinense, Trifolium repens, Hydrocotyle asiatica, Hypochaeris radicata, Sonchus asper, Bidens pilosa, Impatiens khasiana, I. radicans, Osbeckia crinita, O. glauca and Gaultheria fragrantissima.

BIOTIC FACTORS AND DISTURBANCE OF FORESTS.

Much of the forests in Meghalaya have suffered from deforestation activities. Man has been clearing the original forests in Meghalaya for agriculture and for human settlements. Shifting cultivation or 'Jhumming' as it is popularly known in Meghalaya is a primitive type of agriculture predominantly practised in this region. Jhumming involves the clear felling of the forest trees and allowing them to dry and before the onset of the monsoon, the vegetation and dried trees, etc., of the entire area is burned for cultivation. After cultivating the land for 2 or 3 years and when the yield decreases the area is abandoned and these nomadic tribes select some other forested areas and repeat the process. Earlier the cycle of jhumming used to be between 25-50 years but with the increase in population the jhum cycle has come down to 3-4 years, with the result the forests are being cleared off at a very fast rate. Today it is a very pitiable sight in Garo hills to see the grassy hills which were once clothed by luxuriant evergreen forests. Once the vegetation is removed, the top soil is also washed down due to rains and thus the area becomes unsuitable for forests in due course of time and only some weedy species like Eupatorium odoratum, Mikania micrantha,

Imperata cylindrica, etc., colonise the area. In fact there is hardly any forest left which has not been jhummed at one time or the other. Thus, natural forests have become very rare.

Bamboo forests (Plate 116) in Meghalaya do not represent climax vegetation but is only a seral community in jhummed fallows of 15-25 years age. Again, these forests also are much disturbed. No rule is followed while cutting the bamboos. In Meghalaya bamboo is extensively used as a building material and in some interior villages in Garo hills, bamboo, rather forms the only material for construction of huts. Besides, bamboo is used as fencing materials, as water pipes and for manufacture of decorative articles. Tender bamboo shoots are also eaten by villagers. As a result bamboo forests are also fast disappearing in Meghalaya.

Added to this, the role of Elephants as biotic factor in the destruction of bamboo forests cannot be ignored. The elephant population in Meghalaya mostly sustains on bamboo growth. They break the bamboo culms to get the bamboo leaves and not often they break the bamboo for fun sake. hi frequency

The role of wild pigs and rodents in the destruction of vegetation are by no means to be considered the least. There are plenty of these species living in these forests, and mostly damage the bamboo stumps by making burrows.

Forest fires (for which man is again responsible) also destroy extensive areas of forests. During December to February, when the forests become very dry, a carelessly throwm match-stick or an unguarded village fire is enough to cause devastating effects on vegetation. The jhum owners never bother to protect the fire from spreading to adjoining areas.

Forest fires are of common occurrence in deciduous forests. Once the fire breaks in such forests, it continues for days together and destroy a large tract of vegetation. Such burnt areas are colonised by secondary vegetations and most of the fire resistant species invade the area.

All these factors add to the destruction of the forests and provide suitable habitat for the growth of weedy species like Mikania micrantha, Eupatorium odoratum, Ageratum conyzoides, etc.

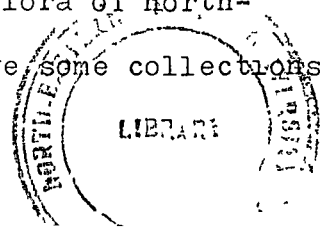
Deforestation leads to destruction of habitat for many species which may be endemic or economically important. Orchid flora which was so rich both in number of species and in number of individuals in each species in Khasi and Jaintia Hills of Meghalaya some hundred years ago, when Hooker wrote his Flora of British India, is now considerably reduced (Rao 1977). It is worthwhile to mention here that Vanda caerulea (Blue Vanda) which was once so abundant in these hills represent one of the rare species of the present day orchid flora. Hooker (1854) collected 7 men's head load of this beautiful orchid to plant in Kew Gardens; whilst it is now very hard to find a dozen of these plants in these

hills. Similarly Aerides multiflorum, Cymbidium elegans, Dendrobium densiflorum, D. nobile, D. formosum, Paphiopedilum venustum, are now becoming scarce in Meghalaya. This has been partly due to disturbance of the natural habitat brought about by the deforestation.

Therefore, today it is not possible to find all orchid species reported by earlier workers from this region (Hooker, 1854, 1872-97; Kataki, 1973) and one has to largely fall back on the previous collections only.

PREVIOUS ACCOUNTS OF BOTANICAL EXPLORATIONS.

The great British Botanist Sir J. D. Hooker in one of his works (1906) remarks on the vegetation and flora of Khasi hills in Meghalaya, as ''the richest in India and probably in the whole of Asia''. Similar views have also been expressed by many subsequent workers on Indian flora. But inspite of this richness and peculiarities of flora, the state of Meghalaya along with the entire north-eastern region remains botanically underexplored. Though plant collections have been made eversince the time of Buchnan-Hamilton (1820), Roxburgh (1820-24), Wallich (1820, 1829-32), Griffith (1847), Hooker (1854, 1872-97, 1905), Burkill (1925), Fischer (1938), and Bor (1940-42), a concise account of the flora of Meghalaya remains to be worked out totally. Most of these works are either passing remarks on the flora of north-eastern region including Meghalaya, or only involve some collections



from this region. As such these works are only of historical importance.

The publication of the massive Flora of British India by Hooker (1872-1897) boosted the works on various regional floras in the country, the last of which to be published was the 'Flora of Assam' (Kanjilal et al., 1934-1940), covering the entire north-eastern region. Being compiled by the Forest officers, this flora inspite of its merits shows a strong bias towards the woody forest species. Moreover, the monocotyledonous plants have not been studied in this work, except a solitary family namely, Gramineae by Bor, (1940). Thus the conspicuous lacuna in the knowledge of the monocotyledonous plants persisted even after the publication of a regional flora.

After the reorganisation of the Botanical Survey of India and establishment of a separate regional circle at Shillong in 1956, botanical exploration in this region again gained momentum and top priority was given to the preparation and publication of a monocot flora of North-Eastern India on the same lines as that of Flora of Assam (Kanjilal et al., 1934-1940). As a prelude to this, various monocot families and a few district floras were tackled in the form of doctoral dissertations by various officers of the Survey (Joseph, 1968; Balakrishnan, 1971; Verma, 1971; Kataki, 1973).

Verma (1971) has studied in detail the family Cyperaceae of the region. He has described 179 species under 14 genera from the north-eastern India. This account intended to serve the same

purpose for Cyperaceae as Bor's (1940) for grasses of Assam. Similarly, Kataki (1973) has given an account of the family Orchidaceae in Khasi and Jaintia hills of Meghalaya. He has treated 275 species under 79 genera. This study is based on his own collections as well as collections made by the previous collectors (Hooker, 1872-97). Recently Neogi (1980) has studied the weed flora of Meghalaya. He has reported 185 monocot species under 93 genera from agriculture lands and Fishery tanks of Meghalaya. However, these works still remain unpublished.

Rao & Verma (1968, 1970, 1972, 1973, 1976a, 1976b) have made a few significant contributions through a series of studies under 'Materials towards a monocot flora of Assam'. They have given the taxonomic accounts of various monocot families and have also described some new taxa. Other contributions in this line are those of Naik & Panigrahi (1961); Naik (1964); Panigrahi (1965), but these publications deal with monocots of whole of North-Eastern India.

Besides these family/generic accounts, numerous reports on new species or new records of Monocots from the region have also been published (Kataki & Panigrahi, 1963; Joseph & Yoganarasimhan, 1967a, 1967b; Sastry, 1967; Rao & Joseph, 1968; Rao & Balakrishnan; 1968, Rao & Hajra 1976; Deori & Bhumik 1976; Prakash et al., 1978; Jain, 1978).

There are also a few publications which do not exclusively deal with monocot but deal with the general floristics of the area

(Rao & Panigrahi,1961; Rao, 1974; Rao & Kharkongor, 1977; Rao & Neogi, 1978; Ghosh et al.,1978; Jain & Satry, 1980).

The study of Jain and his associates (Jain, 1966, 1968; Ved Prakash et al. 1978), on the grasses of India also include collections from Meghalayan region. While the above accounts mostly deal with taxonomic treatments of Monocot taxa, there are also some publications dealing with the cytotaxonomic aspects of Commelinaceae (Panigrahi & Kammathy, 1963, 1964).

Thus it is evident that most of the works deal with the monocots of the whole of Nort-Eastern region, and publications on the plants of Meghalaya proper are rather very scanty.

PRESENT STUDY

1. Field and Herbarium methods:

The present study deals exclusively with the monocotyledonous plants of Meghalaya and is based on extensive field work. Regular surveys extending over a period of years (1976-1980) have been made in different parts of Meghalaya and at different seasons, for collection and study of the Flora. These places visited have been shown in the accompanying map of Meghalaya (Fig. 1). In the field, while collections, special attention was given to observe and record the field information, such as habit, correct habitat, frequency, common associates, colour of leaves, flowers, fruits, etc. and many other characters that cannot be

observed in dry herbarium specimens. Special care was also given to search and collect some of the ephemeral plants in the region.

In general, collection, pressing, drying, poisoning, mounting, etc. have been made as per the routine herbarium practices recommended by Jain & Rao (1976). However, methods of collection and preparation of herbarium specimens belonging to specialised groups such as Araceae, Musaceae, Zingiberaceae and Bamboos need some elaboration here. While collection of Araceae specimens, special attention was given to record the characters of underground parts, specially of their shape, size and colour, as the flowers of this family are inconspicuous. Morphological characters of spathe, colour, etc. were also noted in the field. Where possible, the whole plants along with the underground tubers were pressed and in cases of larger tubers, the tubers were split and a portion of the same was pressed. The same procedure was adopted in case of some Amaryllidaceae and Dioscoreaceae members.

In case of Musaceae part of the axis of the inflorescence, a complete spathe along with flowers and young fruits were pressed along with noting down the details of leaves, leaf-sheaths, etc.

Specimens of Palmae (Arecaceae) pose some problems for making the herbarium specimens. In this case, part of the leaf with sheaths and a part of the inflorescence was collected. Illustrations, and in some cases photographs were made of the whole leaf and inflorescence and descriptions of these things were noted down in the field itself. Similar procedures were adopted in case

of collection of members of Pandanaceae. Here ripe fruits were collected and preserved in the museum. Shape of leaf tips were noted down in the filed note book as suggested by Van Steenis (1950).

Bamboos are again a difficult group for collection for the Herbarium, mainly because of their large sized culms and culm-sheaths and also because of their rarity of flowering. Hence only culm-sheaths and portion of leafy twigs were collected. Approximate heights and diameter of culms were noted in the Field note book while collecting these plants. In some cases photographs of entire clumps of Bamboos are also taken.

In case of Zingiberaceae and Orchidaceae since floral characters are very important for identifications and also because the flowers get malformed after drying, some extra flowers were collected in liquid medium for study in the herbarium.

All the specimens were identified with the help of available literature and were later matched and confirmed in the Herbarium, of the Botanical Survey of India, Shillong (ASSAM). Determination of some species of Eriocaulaceae, Cyperaceae, etc. have also been made with the help of some experts* working on these groups.

All these specimens along with Field note books have been deposited in the Herbarium of the North-Eastern Hill University,

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* Thanks are due to Dr. Harold N. Moldenke and Director, Royal Botanic Gardens, Kew, England for determining some of our Eriocaulaceae and Cyperaceae sheets respectively.

Shillong (NEHU*). Besides collections deposited in this Herbarium (NEHU), a few specimens which are deposited in ASSAM herbarium and which were not encountered by the author in the area covered during field trips are also included in this flora. However, some of the very old collections which are supposed to have been collected from Meghalaya by early collectors have not been included in the present study since it has been felt that these species either do not occur in those places mentioned by early collectors or have been completely eliminated with the process of deforestation, which is going on rather on a very large scale. Orchids can specially be mentioned under this category.

2. Style of presentation of the Flora

The arrangement of the families in this flora follows the system of Cronquist (1968) with slight modifications in conformity with Hutchinson (1959), and the list of 'Nomina Familiarum Conservada' of the Settle code (1972), as far as the circumscription of certain families concerned. The genera and species under each family are arranged alphabetically.

Keys to the identification of families, genera and species have been given and these in most cases refer to collections from Meghalaya only.

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* The abbreviation 'NEHU' for the Herbarium of North-Eastern Hill University, Shillong, is yet to find a place in 'Index Herbariorum'.

As far as possible, with the limited available literature Nomenclature of the taxa have been checked and brought up-to-date in conformity with the Settle Code (1972), and other recent literatures. In the citations of species an extensive synonymy is avoided. Basionyms where available are also given. Vernacular names (Khasi, Garo and Jaintia names) where available are also given after the citation of species, and these are indicated as 'K', 'G', &'J', respectively.

Description of species is largely based on the voucher specimens deposited in the Herbarium. All measurements are in metric system and are based on the averages of a large number of sheets in the herbarium.

Illustrations of species, where given, are based on some voucher specimens which are deposited in the Herbarium, Most of the illustrations have been drawn with the help of fresh plants; and these are only to facilitate the easy identifications of species.

After the description of species brief notes on the correct habitat, and distribution, uses if any and any other details are also given. Phenology (Flowering and fruiting periods) of the species is also given.

Taxonomic treatment is followed by a bibliography and an index to botanical names.

RESULT AND CONCLUSION

The present flora is the outcome of 3 years collections and study of monocot plants of Meghalaya. In all 736 species belonging to 298 genera and 35 families are treated in this flora, following the system of Cronquist (1968). However, it is not claimed to be an exhaustive flora; as more additions could be possible with further botanical explorations in the state. As it is evident from the table the five dominant families in the monocot flora of Meghalaya are in line with Hooker's (1893-97). Though almost all plants reported by previous workers are encountered in the present study, Orchidaceae takes a strong exception to this. Two possible reasons for this could be (a) destruction of the habitat of these orchids which is going on rather on a large scale, and (b) inadequate survey of the area. But, if one looks at the fast disappearing forests of the state and also a comparison of the Flora and vegetation of the past and present, one has to support rather the first view. Following the jhum operations and raising of monocultures the specific habitat of many orchid species have disappeared. Some orchid species are even specific in their host species and with the replacement of such host trees the orchid species have also

vanished. Indiscriminate collections of orchids by traders, tourists, etc. from the wild growth has also contributed much to the disappearance of orchid species.

It is therefore, reported here only those orchid species which were collected during the course of present study and also those collections made by some recent collectors (Kataki, 1973) from the area, avoiding species mentioned by Hooker (1888-1889) about a century ago and which probably do not exist now.

It is hoped that the present work forms the first and nearly a complete monocot flora of the state of Meghalaya.

K E Y T O F A M I L I E S

1a. Ovary superior.

2a. Perianth absent or reduced to scale-like or bristle-like or to lodicules.

3a. Flowers on a spadix, subtended by a spathe.

4a. Shrubs or trees with long, ensiform, spinulose leaves arranged in 3-farious spirals, often with aerial roots; flowers dioecious, crowded and catkin-like; spathe not modified . . Pandanaceae

4b. Herbs to undershrubs; leaves otherwise; flowers bisexual or monoecious, if dioecious then with tuberous roots; spathe often modified . . . . . Araceae

3b. Flowers seldom on a spadix.

5a. Flowers unisexual, in depressed or subglobose heads; ovary 3 or 2-celled with one pendulous ovule in each cell; scapigerous herbs . . . . Eriocaulaceae

5b. Flowers mostly bisexual, rarely unisexual, in spikelets with imbricating glumes; ovary 1-celled with erect or ascending ovule; grassy herbs.

6a. Stem solid, mostly triquetrous; leaves 3-ranked with closed sheaths; anthers basifixed; embryo free from the pericarp . . . . . Cyperaceae

6b. Stems hollow, terete; leaves 2-ranked with open sheaths; anthers dorsifixed, versatile; embryo adnate to the pericarp . . . . . Poaceae (Gramineae)

2b. Perianth present, or if very reduced or minute, then flowers not accompanied by glumes.

7a. Carpels free or gynoecium of 1 carpel and 1 stigma.

8a. Flowers bracteate.

9a. Ovules scattered all over the inner surface of carpels. . . . . Butomaceae

9b. Ovules inserted on placentas.

10a. Aquatic or marshy herbs; outer perianth herbaceous, inner corolline; flowers in umbellate or panicled whorls, not subtended by spathe . . Alismataceae

Next Ch?

10b. Terrestrial, trees or shrubs; sometimes climbing; leaves flabellate-plicate or pinnatisect; both series of perianth calycine, rigid or herbaceous; flowers in panicles with spathaceous bracts . . . . . Arecaceae (Palmae)

8b. Flowers ebracteate; in erect, emerging naked spikes; perianth of 4 sepals; stamens 4; submerged or floating herbs . . . . . Potamogetonaceae

7b. Carpels united.

11a. Flowers in dense capitate head, often surrounded by an involucre of bracts.

12a. Flowers bisexual, usually yellow; sepals unequal . . . . . Xyridaceae

12b. Flowers unisexual, monoecious, usually white or blackish; sepals equal . . . . . Eriocaulaceae

11b. Flowers solitary or in cymes, racemes, or panicles.

13a. Perianth of distinct calyx and corolla.

14a. Trees or shrubs; rarely climbing; leaves plicate; panicle spathaceous Arecaceae (Palmae)

14b. Otherwise; panicle spathaceous or not.

15a. Fruit a capsule or if indehiscent (Pollia) fragile and blue . . Commelinaceae

15b. Fruit an aggregate of apocarpous berry . . . . . Bromeliaceae

13b. Perianth of subsimilar whorls, either petaloid and conspicuous or sepaloid, dry and hyaline.

16a. Both series of perianth similar or subsimilar, petaloid.

17a. Perianth segments 2-merous; stamens 4, twining herbs . . . . . Stemonaceae

17b. Perianth segments 3-merous; stamens variable in number.

18a. Flowers in a spadix enclosed by a spathe . . . . . Araceae

18b. Flowers seldom in a spadix, nor enclosed in spathes.

19a. Aquatic, erect or floating herbs; inflorescence terminating a 1-leafy scape . . . . Pontederiaceae

19b. Terrestrial plants; inflorescence not as above.

20a. Flowers bracteate; fruit a capsule or a berry.

21a. Scapose herbs; inflorescence with branched hairs; style undivided. . . . . Haemodoraceae

21b. Non scapigerous herbs; inflorescence glabrous or with simple hairs; style usually divided.

22a. Flowers in umbels or heads, sheathed by one or more spathes

herbs without distinct above
ground stems . . . . Alliaceae

22b. Flowers not in umbels or heads; herbs or undershrubs with or without distinct above ground stems.

23a. Climbing plants; leaves reduced to cladodes . . . . . Asparagaceae

23b. Erect plants, if climbing leaves not reduced. . . Liliaceae

20b. Flowers ebracteate; fruits otherwise . . . . . Smilacaceae

16b. Both series of perianth sepaloid, or dry and hyaline.

24a. Flowers bisexual.

25a. Trees or shrubs, rarely climbing; flowers in panicles; leaves plicate in bud, pinnately divided . . . Arecaceae (Palmae)

25b. Herbs; flowers not in panicle; leaves not as above.

26a. Flowers in compact inflorescence with leaf-like bracts; ovules 3-many in each locule; fruit capsular . . Juncaceae

26b. Flowers crowded into a spadix; ovules variable in number; fruit capsular or not. . . . . Araceae

24b. Flowers unisexual.

27a. Shrubs or small trees with aerial roots; leaves spiral, margin prickly . . . . . Pandanaceae

27b. Tall herbs; leaves not as above; Sparganiaceae

1b. Ovary inferior.

28a. Perianth in 2-series; outer sepaloid and inner petaloid.

29a. Seeds very minute and numerous.

30a. Flowers regular, anthers 6, free; ovary 3-celled . . . . . Burmanniaceae

30b. Flowers irregular; anthers 1 or rarely 2, confluent with ovary column; ovary 1-celled . . Orchidaceae

29b. Seeds conspicuous.

31a. Flowers highly irregular, at least the inner perianth.

32a. Stamens 3; pollen granular . . Iridaceae

32b. Stamens either 1 or 5, never 3; pollen otherwise.

33a. Both series of perianth united, tubular or spathaceous; anthers 2-celled.

34a. Flowers bisexual; fruit capsular; inner perianth series funnel-shaped below and 3-lobed above; anthers united with the style.

35a. Leafy stems spirally twisted . . . . Costaceae

35b. Leafy stems not spirally twisted . . Zingiberaceae

34b. Flowers unisexual; fruit berry-like, indehiscent; both perianth series spathaceous; stamens free, 5 perfect with 1 staminode . . . Musaceae

33b. Outer perianth segments free; anthers 1-celled, laterally adnate to broad petaloid staminode.

36a. Ovules many in each cell; style terminal . . Cannaceae

36b. Ovule 1 in each cell; style excentric . . . Marantaceae

31b. Flowers regular or nearly so, at least the inner perianth.

37a Fertile stamens 3 or more.

38a. Flower unisexual; ovules spreading all over the inner surface of the carpels; seeds many, minute with no endosperm . . . . . Hydrocharitaceae

38b. Flowers bisexual; ovules otherwise; terrestrial plants with spirally arranged leaves in rosettes . . Bromeliaceae

Check ?

37b. Fertile stamen 1 only.

39a. Anthers 2-locular; sepals united, spathaceaus.

40a. Leafy stem spirally twisted . . . Costaceae

40b. Leafy stem not spirally twisted . . . . . Zingiberaceae

39b. Anthers 1-locular; sepals otherwise.

41a. Ovules numerous in each locule . . Cannaceae

41b. Ovule 1 in each locule . . . . Marantaceae

28b. Perianth in 2 series, both series corolline.

42a. Seeds very minute, albumen 0.

43a. Flowers regular; stamens mostly 6, opposite the petals, free from the style; pollen grains not cohering in pollinia; terrestrial plants with reduced leaves . . . . . Burmanniaceae

43b. Flowers highly irregular; stamens 1 or 2, rarely 3, adnate to the style; pollen grains cohering in pollinia; terrestrial or epiphytic plants; leaves well developed . . . . Orchidaceae

42b. Seeds conspicuous.

44a. Flowers mostly unisexual.

45a. Fruits winged; plants terrestrial or climbing . . . . . Dioscoreaceae

45b. Fruits winged or not; plants aquatic . . . . . Hydrocharitaceae

44b. Flowers bisexual.

46a. Stamens 3; pollen grannular; leaves distichous, laterally compressed . . Iridaceae

46b. Stamens 6 or more; pollen not grannular; leaves not as above.

47a. Leaves radical; bracts leafy; perianth segments reduced to long thread-like structures; fruit a berry . . . Taccaceae

47b. Leaves radical or not; bracts not leafy; perianth segments not thread-like.

48a. Inflorescence scapose, umbellate subtended by an involucre of bracts . . . . . Amaryllidaceae

48b. Inflorescence not as above.

49a. Coarse shrubby or arborescent plants with firm, perennial leaves; inflorescence mostly gigantic; perianth with distinct tube . . Agavaceae

49b. Plants otherwise.

50a. Inflorescence scapose, radical; perianth usually glabrous; leaves fibrous or plicate . . . . . Hypoxidaceae

50b. Inflorescence not as above; perianth hairy, often with branched hairs; leaves not plicate if plicate then slightly fleshy. . . . . Haemodoraceae

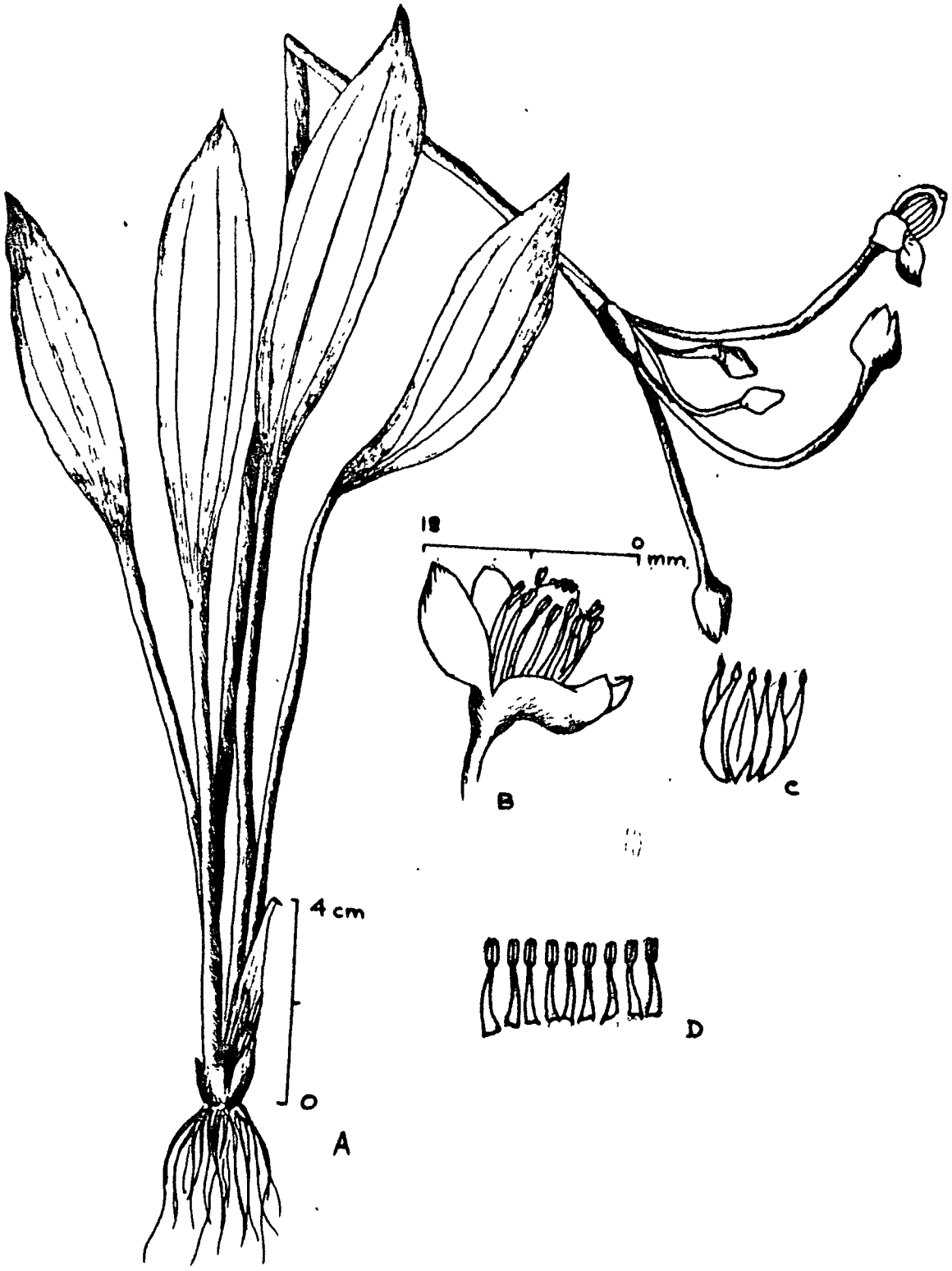

Plate 1 Tenagocharis latifolia (D.Don) Buch. A. Habit, B. Flower, C. Carpels, D. Stamens.

A L I S M A T I D A E

ALISMATALES

Butomaceae

L.C.Rich. Mem. Mus. Hist. Nat. Paris 1: 366. 1815.

Annual, marshy herbs with milky juice. Leaves radical. Inflorescence umbellate. Flowers bisexual, solitary or in superposed bracteate whorls. Sepals 3, persistent; petals 3; stamens 8-12; carpels 6-9, on a flat thalamus; styles short; ovules many, on branched parietal placentas or scattered on semi-laminal placentas. Fruits follicles of 6-7. Seeds minute.

Tenagocharis Hochst.

Characters of the Family.

Tenagocharis latifolia (D.Don) Buch. in Abh. Naturw. Ver. Bremem 2: 2, 3 & 6. 1868; Hartog 16: 7. f. 3. 1903; et in Fl. Males. 5: 118. f. 1. 1957; Hara Fl. East. Himal. 348. 1966. - - Butomus latifolius D.Don Prodr. Fl. Nepal. 22. 1825. - - Butomopsis lanceolata Kunth Enum. Pl. 3: 165. 1841; Hook.f. Fl. Brit. India 6: 562. 1893 (Plate1).

Scapes variable. Leaves elliptic, entire, leathery, glaucous with milky juice, narrowed into a petiole, blade 5-15 x 1-3 cm. Sepals 3, 5-10 mm across, elliptic, obtuse,

persistent; petals 3, white, larger than the sepals; stamens 8-10; filaments slender; anthers oblong; carpels 6. Follicles 6-7. Seeds numerous, dark brown, shining, beaked.

A weed of paddy fields.

Fls. & Frts.: September to December.

Specimens examined: Myrthong 1489, 3076 Nongpoh (Khasi Hills).

Alismataceae

Vent. Tabl. Regne. Veg. 2: 157. 1799.

Perennial, aquatic or marshy herbs with long petioled cordate or sagittate leaves. Flowers bisexual or unisexual in umbel-like or spicate inflorescence. Sepals 3, persistent; petals 3, membranous, rose or white, deciduous; stamens numerous; carpels few to many; styles long or short, rarely 0; stigmas papillose; ovule solitary. Fruits aggregate of achenes.

K E Y T O G E N E R A

1a. Leaves sagittate at base; flowers unisexual or polygamous; receptacle globose; stamens usually more than 9. . Sagittaria

1b. Leaves rounded or cordate at base; flowers bisexual; receptacle flat; stamens usually less than 9 . . . . . Alisma

Alisma (Dill) Linn.

Alisma plantago-aquatica Linn. Sp. Pl. 342. 1753; Hook.f. Fl. Brit. India 6: 559. 1893; Babu Herb. Fl. Dehra Dun 542. 1977.

Scapigerous herbs. Roots fibrous, tufted. Stems variable 10-50 cm high, spongy. Leaves linear-lanceolate, 5-15 x 1-4 cm, acute, narrowed into a long petiole. Flowers bisexual. Sepals 3, recurved at anthesis, 6 mm across, greenish; petals 3, larger than the sepals; stamens 6-9; filaments filiform; carpels few to many on small receptacle. Achenes turgid or compressed.

Rare, occurs in stagnant, permanent ponds, pools and ditches.

Fls. & Frts.: September to November.

Specimens examined: Myrthong 1803 Partong (West Khasi Hills).

Sagittaria Linn.

Marshy herbs. Leaves sagittate, deeply lobed at base. Flowers unisexual or polygamous in panicle or spicate inflorescence. Receptacle globose or oblong. Sepals 3, persistent; petals 3, membranous, deciduous; stamens numerous, 6-10 in male flowers, 9-10 in bisexual ones; carpels numerous crowded on globose or oblong thalamus; stigma papillose; ovule solitary in each carpel.

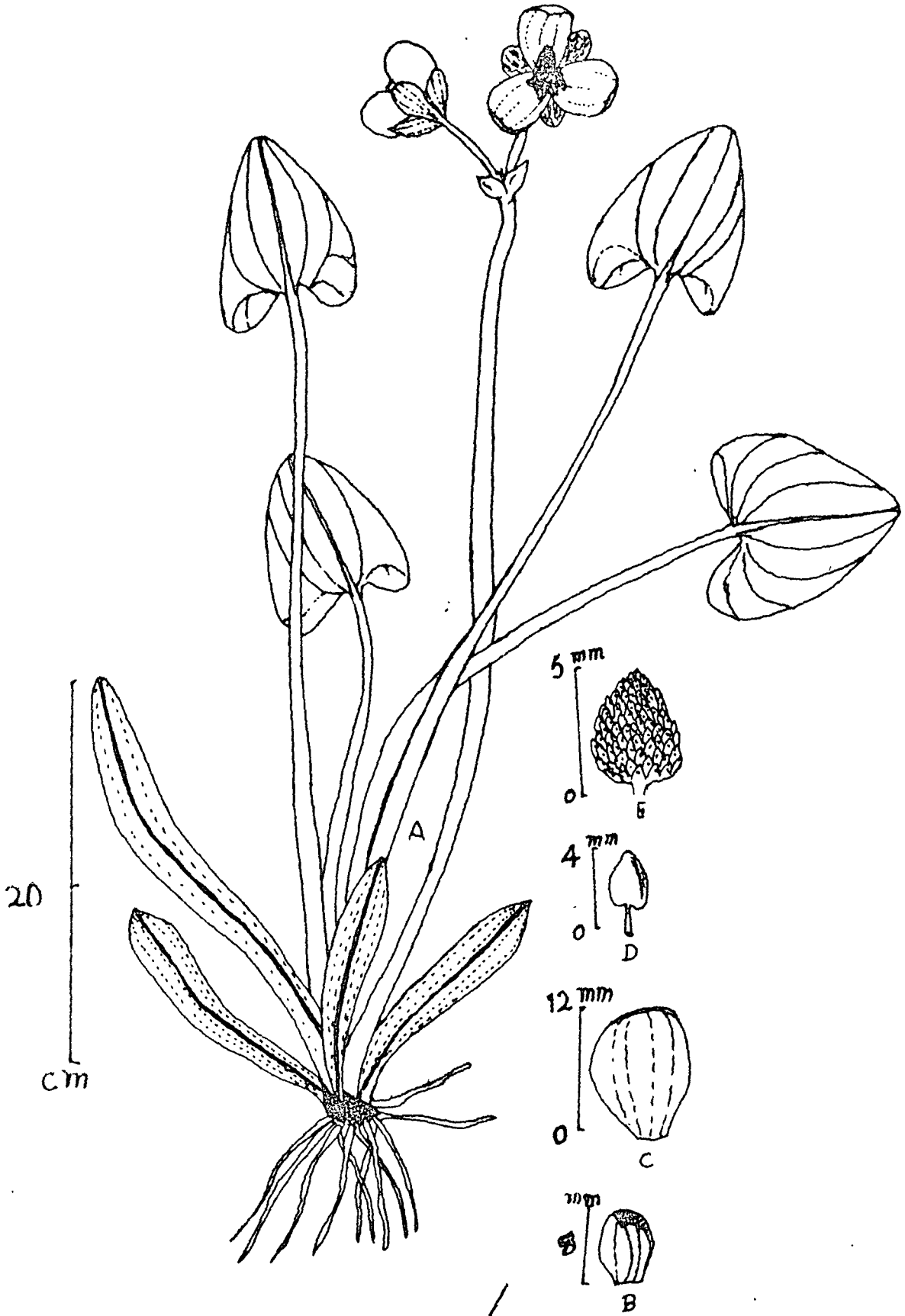

Plate 2. Sagittaria guayanensis H.B.& K. A.Habit B. Sepal, C.Petal, D.Stamen, E.Pistil.

K E Y T O S P E C I E S

1a. Leaves deeply lobed at base, lobes longer than the blade, not floating; flowers unisexual; achenes flat, dorsally winged. . . . *sagittafolia*

1b. Leaves cordate at base, not lobed, orbicular, floating; flowers polygamous; achenes not winged. . . . *guayanensis*

Sagittaria guayanensis H.B.& K. Nov. Gen. Sp. 1: 250. 1816 subsp. *lappula* (D.Don) Bogin Mem.N. York bot Gard. 9: 192. f. 5. 1955; Hartog Fl. Males. Ser. 1, 5: 328. 1957; Babu Herb. Fl. Dehra Dun 543. 1977. - - *Sagittaria lappula* D.Don Prodr. 22. 1825. - -*S. guayanensis* auct. (non H.B.& K. 1816); Hook.f. Fl. Brit. India 6: 561. 1893; (Plate 2).

Roots fibrous, spongy. Leaves floating, cordate at base, basal lobes obtuse or orbicular, 2-6 x 1-3 cm ; petiole long. Inflorescence a raceme, 2-4 flowered in each whorl; lower whorls females and upper whorls males. Bracts 3, in each whorl, adnate at base, margin scarious. Perianth white, about 1 cm; outer segments ovate-lanceolate, keeled; inner segments ovate-orbicular, dentate at the top; stamens 8-12 in bisexual flowers, 6-10 in male flowers; carpels crowded. Achenes numerous, ovoid, elliptic ribbed, flat, crested on the face, about 4 mm .

Common weeds in paddy fields. Leaves very variable; basal leaves subulate or spathulate; upper leaves orbicular, cordate, floating on water. Petiole length varies depending on the depth of water.

Fls. & Frts.: June to November.

Specimens examined: Myrthong 1959 Way to Baghmara (Garo Hills); 3075 Nongpoh (Khasi Hills).

Sagittaria sagittifolia Linn. Sp. Pl. 993. 1753; Hook.f. Fl. Brit. India 6: 561. 1893 subsp. leucopetala (Miq.)Hartog in Fl. Males. Ser. 1. 5: 332. 1957.

Vern.-' Lapohdongkhnam ' (K).

Scapigerous, marshy herbs. Leaves hastate or sagittate, deeply lobed at base, limb longer than the blade, acute, blade about 6 cm, lobes about 8-10 cm; petioles longer than scapes, with distinct cross-veins, and longitudinal rays, sheathing at base. Inflorescence a raceme. Flowers unisexual, in the axil of ovate, scarious bracts. Sepals 3, recurved at anthesis, membranous, about 5 mm across; petals 3, white, larger than the sepals, orbicular, margin shortly toothed or slightly waved, with yellow lines at base; stamens 6, filaments filiform, compressed; carpels numerous crowded on the globose receptacle. Fruits turgid or compressed achenes.

Common on marshy grounds, both in open and shaded locali-

ties. It occurs also in shallow pools, tanks, etc.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1464 Phulbari (Garo Hills); 1487 Nongpoh (Khasi Hills).

HYDROCHARITALES

Hydrocharitaceae

Juss. Gen. 67. July-August 1789.

Submerged, fresh-water, annual or perennial herbs with fibrous roots. Leaves cauline, radical or whorled. Flowers solitary or in clusters, terminal or partly sunk in a 2-fid, spathaceous bract, unisexual or bisexual. Perianth 3-6, in 1-2 series. Stamens 3-12, in 1-4 series; ovary inferior, usually produced into a long beak, bearing floral parts, unilocular; ovules numerous on parietal placentas; style 3-12. Fruits ovoid or elongated, fleshy, enclosed in a persistent spathe. Seeds variable, tuberculate, apiculate or caudate.

K E Y T O G E N E R A

1a. Stems leafy; leaves in whorls; flowers bisexual . . . . . Hydrilla

1b. Stemless; leaves radical; flowers bisexual or unisexual.

2a. Leaves petioled; stamens 6-8;
spathe winged. . . . . Ottelia

2b. Leaves sessile, linear
grass-like; stamens 3;
spathe not winged. . . . . Blyxa

Blyxa Noronha ex Thou.

Leaves radical, grass-like, entire or minutely serrulate. Flowers unisexual or bisexual; male flowers: several in a 2-toothed spathe; sepals 3, linear; petals 3; stamens 8-9; female flowers: solitary, in a tubular spathe; sepals 3, linear; petals 3; ovary 1-celled, beaked; bisexual flowers: stamens 3-9, in 1-3 series; carpels 3. Fruits enclosed in a ribbed spathe. Seeds tubercled with or without tails.

K E Y T O S P E C I E S

1a. Seeds spinescent, tailed
at both ends. . . . . echinosperma

1b. Seeds sparsely tubercled,
not tailed. . . . . aubertii

Blyxa aubertii L. Rich. Mem. Inst. Paris 2: 19-25. 77. t. 4. 1812; Hartog in Fl. Males. Ser. 1. 5: 385. 1957; Subram. Aquat. Ang. 59. 1962; Babu Herb. Fl. Dehra Dun 475. 1977. - - B. ceylanica Hook.f. Fl. Brit. India 5: 661. 1888 (Plate 34)

Vern.-' Batthiatum ' (K).

Plate 3 A. Blyxa aubertii L. Rich. B. Flower open out, C. Ottelia alismoides (Linn.) Pers. D. Petal E. Fruit, F. Stamen, G. Pistil.

Submerged leafy plants, tufted, acaulescent; roots fibrous. Leaves strap-shaped varying in length, 10-40 x 0.5-1 cm. Flowers solitary; spathe 6-15 cm long. Perianth 6, membranous; stamens 3; anthers yellow; carpels 3. Capsule 3-6 cm long with long tail-like end. Seeds tubercled, numerous about 1 mm.

One of the very variable plants depending on the depth of water. Offers good shelter for Fishes and other aquatic organisms in the ecosystem.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 1708 Shillong; 1881 Cherrapunjee (Khasi Hills); 3141 Baghmara (Garo Hills).

Blyxa echinosperma (Cl.) Hook.f. Fl. Brit. India 5: 661. 1888; Hara Fl. East. Himal. 3 Rep. 119. 1975. - - Hydrotrophus echinospermus Cl. in Trans. Linn. Soc. Bot. 14: 8. t. 1. 1875.

Vern.- 'Batthiatum' (K).

Rootstock fibrous, submerged, leafy, stemless. Leaves linear, strap-shaped, 10-30 x 0.5 cm. Inflorescence solitary, from base of the stem or in the axil of leaves on long peduncle; spathe long about 10-15 cm long. Flowers bisexual. Perianth 6, in 2-series; stamens 3; anthers yellow, enclosed by spathe; styles long, coiled. Seeds numerous, white.

One of the very variable plants, depending on the depth of water. Offers good shelter for Fishes and other aquatic organisms in the ecosystem.

Fls. & Frts.: February to December.

Specimens examined: Myrthong 1492 Umroi (Khasi Hills).

Hydrilla L.Rich.

Hydrilla verticillata (Linn.f.) Royle Ill. Bot. Himal. t. 376. 1839; Hook.f. Fl. Brit. India 5: 689. 1888; Hartog in Fl. Males. Ser. 1. 5: 385. 1957; Babu Herb. Fl. Dehra Dun 475. 1977. - - Serpicula verticillata Linn.f. Suppl. 416. 1781.

Submerged fresh-water herbs, stems slender green, rooting at nodes. Leaves 3-8 in each whorl, oblong or linear, 1-4 x 0.4-0.8 cm, serrate. Flowers unisexual, white or reddish; sepals 3, ovate, greenish; petals 3, oblong, white; staminate flowers shortly pedicelled; stamens 3; anthers reniform; pistillate flowers sessile; ovary included in a spathe; styles 2-3; stigmas fimbriate. Fruits muricate or smooth. Seeds 2-3, echinate.

Common in ponds, lakes, ditches and streams; offers good shelter for Fishes and other aquatic organisms in the ecosystem.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 2950 Shillong; 2960 Nongstoin (West Khasi Hills).

Ottelia Pers.

Ottelia alismoides (Linn.) Pers. Syn. Pl. 1: 4. 1805; Hook.f. Fl. Brit. India 5: 662. 1888; Hartog Fl. Males. Ser. 1, 5: 39.. 1957; Babu Hefb. Fl. Dehra Dun 476. 1977.- - Stratiotes alismoides Linn. Sp. Pl. 535. 1753 (Plate 3, C).

Roots fibrous. Stems 0. Leaves submerged, very variable, depending on the depth of water, ovate-oblong, reticulate, with distinct parallel veins, long petioled. Flowers solitary, terminal, white. Sepals green, 1 cm long; petals 3, white, ovate-oblong; stamens 6; anthers yellow; ovary glandulous; styles 5-10, hairy. Fruits capsular, angular, with wavy edges. Seeds oblong or fusiform.

Common in ponds under shallow waters; in paddy fields and in pools, ponds, and ditches, etc. In fish ponds it is reported of as good shelter for Fishes and other aquatic organisms in the ecosystem.

Fls. & Fruits. : July to November.

Specimens examined: Arthong 1958 Baghmara (Garo Hills).

NAJADALES

Potamogetonaceae

Dumort. Anal. Fa.. 56, 61, 1829.

Annual or perennial herbaceous, submerged, aquatic plants; stems branched or unbranched, usually dimorphic with creeping rhizomes. Leaves submerged or floating, alternate or opposite, 2-ranked, stipulate; stipule forming a tubular sheath around the stem, free or adnate to the leaf base, the nerves parallel, connected by perpendicular cross-vein; submerged leaves filmy and floating leaves often leathery. Inflorescence axillary or terminal spike or solitary or paired in leaf axils. Flowers bisexual or unisexual, the parts arragned in 1-16 series; perianth absent or if present green, of 4-6 distinct, herbaceous segments in one whorl; stamens 1-4; anthers 1-2-celled, linear; carpels 1-16; placentation apical or parietal; ovule 1, pendulous. Fruits achene-like or drupaceous.

Potamogeton Linn.

Stems variable in length depending on the depth of water, branched or unbranched, rooting at nodes. Leaves all submerged or upper leaves floating, alternate or opposite; petiolate or sessile, linear or elliptic to ovate-oblong, cuneate or cordate at base; margin entire, nerves numerous, cross-veined; stipules tubular, sheathing round the stems

and young inflorescences. Inflorescence a capitate or cylindric spike; flowers minute, 2-4-flowered in each whorl. Perianth 4, greenish; stamens 4, filaments adnate to perianth claw; carpels 4. Fruits drupe-like.

K E Y T O S P E C I E S

1a. Spikes with interrupted drupelets; fruits ribbed, tuberculate; beak hooked . . . . . octandrus

1b. Spikes with dense drupelets; fruits smooth; beak not hooked. . nodosus

Potamogeton nodosus (Roxb.) Poir. in Lamk. Encycl. Suppl. 4: 535. 1816; Babu Herb. Fl. Dehra Dun 544. 1977. P. indicus Roxb. Fl. Ind. 1: 471. 1820 (Plate 4).

Stoloniferous herbs. Stems terete, branched, rooting at the lower nodes. Leaves whorled, ovate-oblong, cordate at base; petiole about 3-15 cm long; blades 5-10 x 1-4 cm, veins many, parallel with cross-veins, acute; stipules 4-6 cm long, membranous. Inflorescence spike or catkin-like, 2-5 x 0.2-0.6 cm. Flowers minute, sessile arranged in whorls; perianth 4, greenish, membranous; stamens 4; filaments united with the perianth; anthers 2-celled; carpels 4. Fruits drupaceous, opening by vertical valves.

Common in ponds, lakes and stagnant waters, offers a good shelter to small Fishes and other aquatic organisms in the ecosystem.

Fls. & Frts. : March to October.

Specimens examined: Myrthong 1590 Jowai (Jaintia Hills); 1806 Mawlai-sien (West Khasi Hills).

Potamogeton octandrus (Hassk.) Poir. in Lamk. Encycl. Suppl. 4: 517. 1816; Babu Herb. Fl. Dehra Dun 544. 1977.- P. javanicus Hassk. Act. Soc. Ind. Needrl. 1: 26. 1856; Hook.f. Fl. Brit. India 6: 566. 1892.

Perennial aquatic herbs. Stems flexuos, branched. Leaves small, about 3 x 0.5-0.8 cm, ovate-oblong, subulate; petioles about 2 cm long, midrib depressed; stipules 1-2 cm long, membranous or pale green. Inflorescence a spike. Flowers minute arranged sparsely on the spike; perianth 4, membranous; stamens 4, with short filaments, attached to the perianth lobes; carpels 4; ovary superior with parietal placentas. Fruits drupaceous, ribbed, tubercled, beak hooked.

Common both in stagnant and running waters.

Fls. & Frts.: August to November.

Specimens examined: Myrthong 1772 Poly-ground (Shillong).

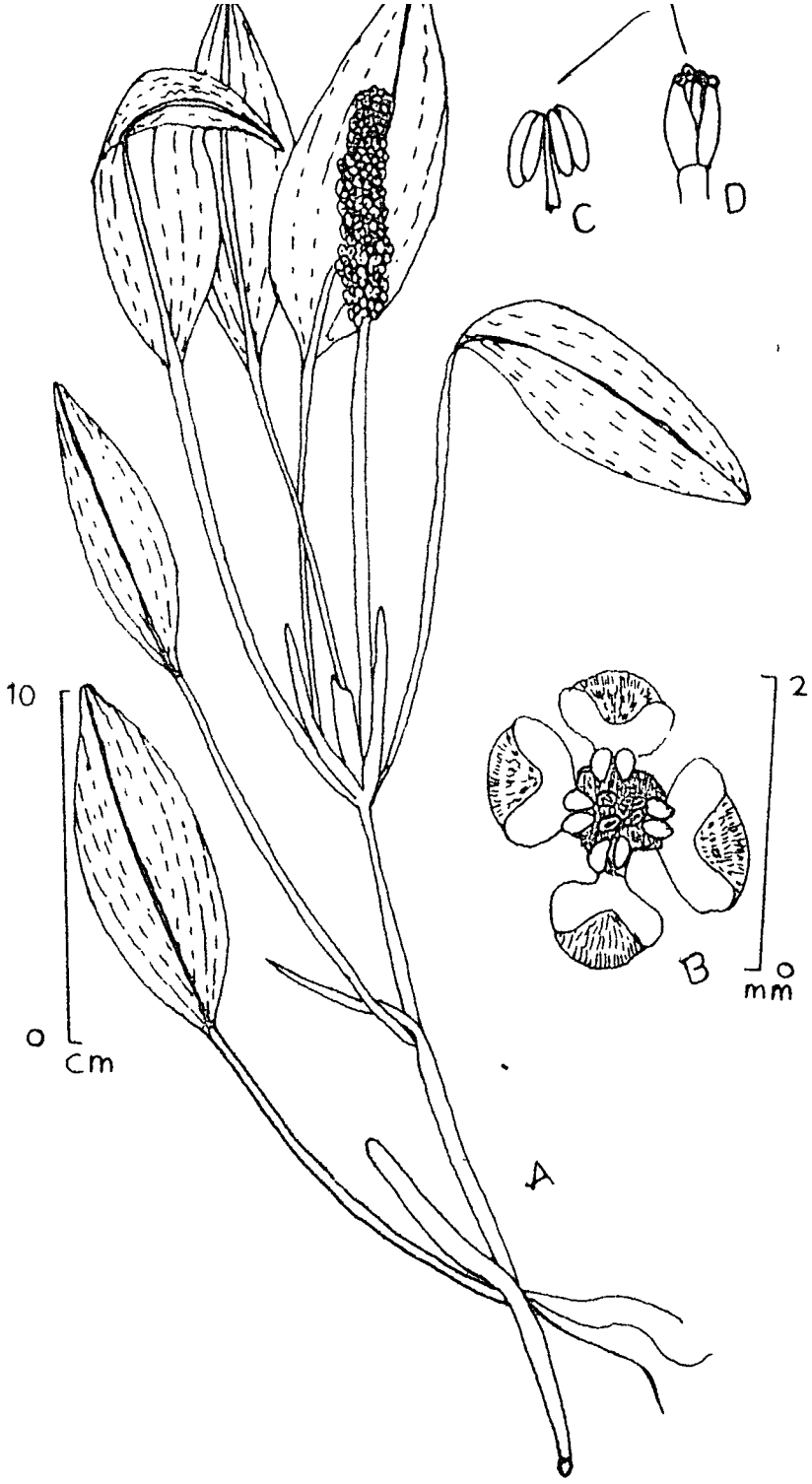

Plate 4 Potamogeton nodosus (Roxb.) Poir. A. Flowering twig, B. Flower (top view), C, Stamen, D. Pistil.

C O M M E L I N I D A E

COMMELINALES

Xyridaceae

A.G. Agardh, Aphor. 158. 1823.

Perennial, marshy herbs. Stems tufted with basal sheaths. Leaves radical, distichous. Inflorescence a globose head, embraced by bracts. Flowers bisexual, small, at the axils of bracts, at the terminal ends of the scapes. Perianth 6, differentiated into distinct cayx and corolla; sepals 3, boat-shaped and hyaline; petals 3; stamens 3, adnate to the claws of petals; sometimes reduced into staminodes; anthers extrose; carpels 3, united at base; ovary superior, 1-celled or sometimes 3-celled; placentation parietal, basal or central; ovules numerous, in 2 to many-rows. Fruits capsules, enclosed by persistent bracts. Seeds numerous.

Xyris Linn.

Stems tufted, slightly compressed; leaves subulate, with many radical leaf-sheaths. Inflorescence a globose head; flowers small; sepals 3, sub-petaloid, enclosing the petals; petals 3, yellow, with distinct claws; stamens adnate to the claw of each petal, hairy below the anthers; carpels 3, united at base. Seeds small.

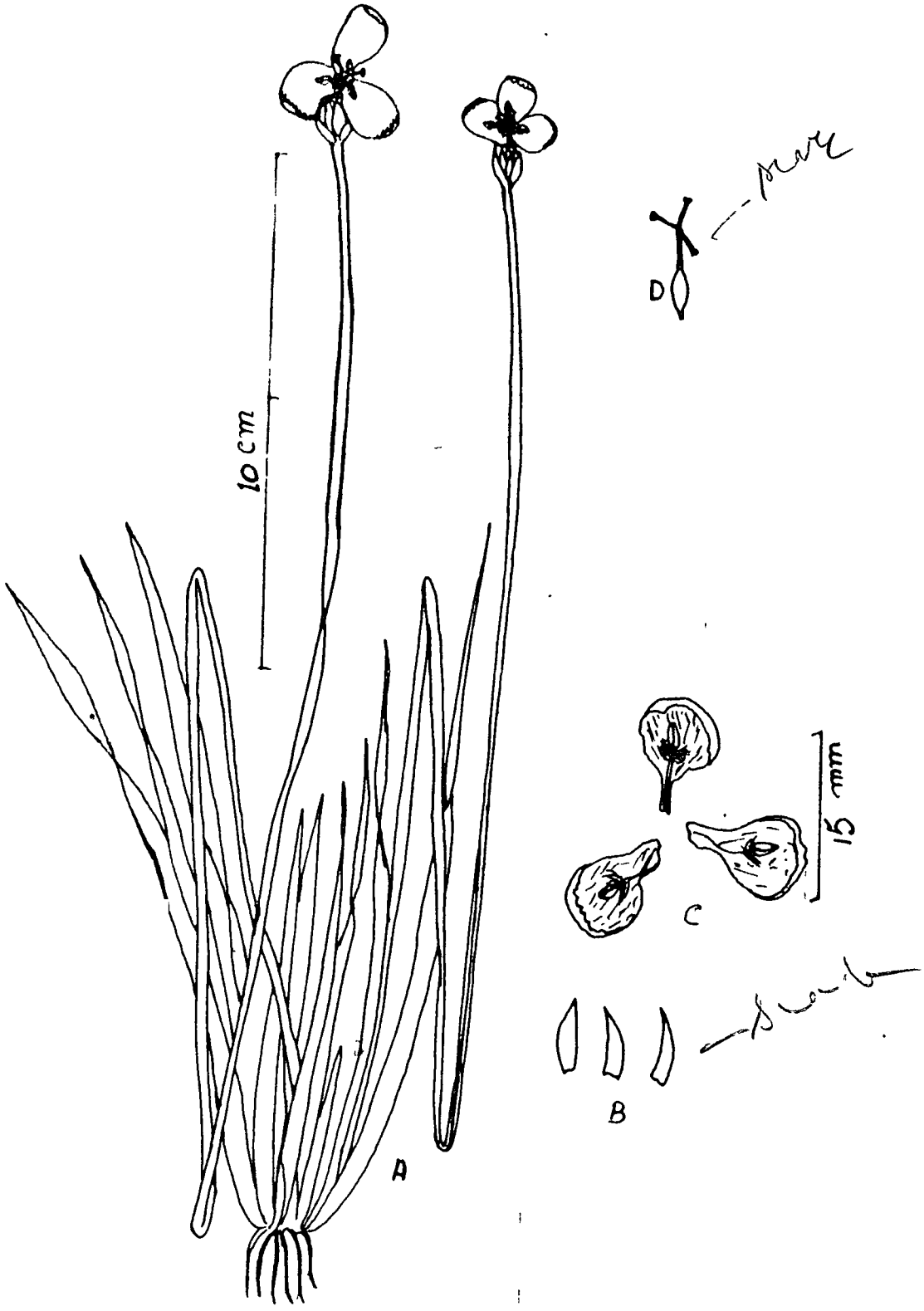

Plate 5 Xyris schoenoides Mart., A. Habit, B. Sepals, C. Petals with epipetalous Stamens D. Gynoecium.

K E Y T O S P E C I E S

1a. Stout, tufted herbs, 40-50 cm high; petals orbicular, bright yellow; bracts keeled towards the margin . . schoenoides

1b. Slender filiform herbs, 15-20 cm high; petals oblong, pale yellow; bracts ribbed, not keeled. . .wallichii

Xyris schoenoides Mart. in Wall. Pl. As. Rar. 3: 30. 1832; Hook.f. Fl. Brit. India 6: 365.1892 (Plate 5).

Stems tufted, 40-60 cm high, laterally compressed. Leaves linear, subulate, much shorter than slender scapes. Heads embraced by brown bracts; bracts subequal, rounded, keeled towards the margin, lateral bracteoles oblong or ob-lanceolate, acuminate, dorsal ones ovate-lanceolate; flowers bisexual; sepals 3, embracing the lower half of the petals; petals 3, bright yellow, orbicular, clawed, margin wavy or slightly toothed; stamens 3, adnate to the claws; anthers sagittate, 2-celled, with tufts of hairs below the anthers; carpels 3, free above; stigma globose. Seeds numerous, dry, enclosed within the persistent bracts and bracteoles.

Com on in marshes and in paddy fields, both in open and shady areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1024 Shillong; 1238 Mawmluh-Cherra; 1792 Pariong (Nongstoin).

Xyris wallichii Kunth. Enum. 4: 16.1843; Hook.f. Fl. Brit. India 6: 365. 1892.

Tufted herbs. Stems filiform, 5-20 cm high. Leaves flat, radical, 3-15 x 0.3-0.5 cm, linear, acute. Scapes compressed. Inflorescence small, spike-like. Flowers bisexual at the axil of bracts; bracts oblong, ribbed, margin not keeled; sepals 3, hyaline , about 4 mm; petals 3, yellow, 4-5 mm long, oblong; carpels 3, free above. Seeds dry, enclosed within the persistent bracts.

Common on walls of clifts in water strained areas.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1080, 1073 Shillong.

Commelinaceae

R. Br. Prodr. 268. 1810.

Annual or perennial herbs, erect or creeping, rarely climbing or straggling. Leaves simple, alternate, costate with sheathing bases. Flowers bisexual, irregular in a terminal or axillary cymes, enclosed by a spathe-like bracts; bracts usually small or obsolete, opposite the pedicels. Perianth 6, in 2-series, inferior; outer 3, sepaloid, inner 3 petaloid; stamens 6, adnate to the base of the inner segments, all perfect or sometimes 2 or more reduced to staminodes; filaments bearded with jointed hairs; anthers oblong or globose or triangular with variously formed connectives; ovary 2-3-celled, free; ovules 1-few in the inner angles of the cells, orthotropous. Fruits

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a loculicidal or an indehiscent capsule. Seeds angular, testa smooth or rugose.

K E Y T O G E N E R A

1a. Flowers embraced by large spathaceous bracts.
  2a. Perfect stamens 6; filaments plumose . . Cyanotis
  2b. Perfect stamens 3; filaments bearded, not plumose. . . . . Commelina
1b. Spathaceous bracts absent.
  3a. Fertile stamens 6.
    4a. Flowers in lateral, sessile, capitate cymes, emerging out from the leaf-sheaths at or above the nodes. . . Forrestia
    4b. Flowers in panicles or racemes.
      5a. Flowers about 5 mm across, in dense terminal hairy panicles . . . . . Floscopa
      5b. Flowers more than 5 mm across in lax racemes . . . . . Pollia
  3b. Fertile stamens 2-3.
    6a. Flowers in umbellate cymes at the axils of crown of leaves. . . . . Aclisia
    6b. Flowers in racemes.
      7a. Flowers regular; fertile stamens 3.. Murdannia
      7b. Flowers irregular; fertile stamens 2-3. . . . . Aneilema

Aclisia E. Mey.

Aclisia secundiflora (Bl.) Bakh.f. in Baker & Bakh.f. Fl. Java 3: 658. 1968. - - Commelina secundiflora Bl. Enum. 1: 5. 1827. - - Aclisia indica Wight Icon. t. 2068. 1853.

61 author?

Pollia sarsogonensis var. indica (Wight) Cl. in DC. Monogr. Phan. 3: 127. 1881. - - P. secundiflora (Bl.) Bakh.f. Blumea 6: 399. 1950.

Stems erect, stout, with dry scale-like sheaths from the basal portion. Leaves 20 x 4 cm, unequal sided, nerves about 12, base cuneate, apex acute; lower leaves with short petioles and distinct sheaths; upper ones sessile and sheaths absent. Panicles branched. Flowers white. Sepals 3; petals 3, white, orbicular, persistent. Styles equaling the filaments but stouter. Capsules white, turning blue at maturity, globose.

Common along the roadsides in shady areas, in association with other herbaceous plants.

Fls. & Frts.: August to November.

Specimens examined: Myrthong 1264 Dawki (Jaintia Hills); 1989 Tasak (Garo Hills).

Aneilema R. Br.

Aneilema scaberrimum (Bl.) Kunth. Enum. 4: 69. 1843; Hook.f. Fl. Brit. India 6: 382. 1892;Rolla Rao in Notes Roy.Bot. Gard. Edinb. 25: 182. 1964; Hara Fl. East. Himal. 399. 1966.- - Commelina scaberrima Bl. Enum. Pl. Java 1: 4. 1827.- - Dictyospermum protensum Wight Icon. 6: 30, t. 2071. 1853. - - Aneilema protensum Wall. ex Thwait. Enum. Pl. Zeyl. 322. 1864.

Stems tall, suberect, glabrous, jointed. Leaves 10-15 x 3-4 cm, lanceolate, acuminate, hairy at the mouth of the

sheaths; base cuneate, peticle short, about 2 cm long, sheathing to more than 3/4 of the internode. Bracts funnel-shaped. Flowers blue or white; sepals 3, orbicular, green; petals 3, orbicular, white or whitish blue, with distinct claws; stamens 2-3; filaments hairy; staminodes 2-3; styles long, curved, stigmas capitate. Capsule hairy. Seeds 3.

Common in the shady areas both in open and deep forests especially in marshy areas. Stems often attain a height of 3-4 meters. The capsules easily stick to the cloth and furs of animals and thus easily gets dispersed.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1081,1151 Shillong;1214 Cherrapunjee; 1929 Tura Peak.

Commelina Linn.

Suberect or creeping herbs. Flowers in scorpioid cymes, sepals 3, membranous, often inner 2 connate below; petals 3, usually blue, 2 with large claws ; perfect stamens 3 with 2-3 sterile ones without connectives; filaments bearded; ovary 2-3-celled, 1-2-ovuled in each cell; styles filiform, slender; stigma subcapitate. Fruits capsules. Seeds ellipsoid or angled, testa reticulate, pitted or rugose.

K E Y T O S P E C I E S

1a. Two anticous cells of the ovary 2-ovuled; posticous 1-ovuled or obsolete.
  2a. Leaves ovate-oblong; spathe funnel-shaped or hooded . . . . . benghalensis
  2b. Leaves linear-lanceolate; spathe complicate, margin free or connate at base . . . . . diffusa
1b. All cells of the ovary 1-ovuled.
  3a. Leaves lanceolate; spathe solitary or crowded, funnel-shaped; seeds ellipsoid, compressed . . . . . paludosa
  3b. Leaves linear or linear-lanceolate spathe cordate with long peduncle; seeds apiculate at both ends, not compressed. . . . . appendiculata

Commelina appendiculata Cl. Comm. Cyrt. Beng. 13. 1876; Hook.f. Fl. Brit. India 6: 374. 1892.

Vern.-' Jatiaw-wat ' (K).

Branches diffuse, straggling or prostrate, slender, glabrous; internodes 10-15 cm long. Leaves sessile, 10-12 x 0.5 -1 cm, linear, subacute, glabrous, margin scabrid, with 1 distinct median nerve; sheaths 2-3 cm long, clasping the stem above the node, hairy on the margins. Spathe simple, very long, tail-like, base rounded or cordate, stalk of the spathe 8 cm long; flowers emerging out from the spathe, blue; sepals 3, subequal; fleshy, white or pale green; petals 3, subequal, deep blue, rounded with distinct limb and claw; stamens 6,

3 fertile with sagittate, yellow anthers; staminodes 3, with blue anthers; filaments all bearded; styles equalling the filaments, slender. Capsule 3-seeded, angular. Seeds black, flat, appendiculate.

Rare plants, occurring in the rocky areas in association with grasses, often straggling on other herbaceous plants.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 3171 Garumpani (Jaintia Hills).

Commelina benghalensis Linn. Sp. Pl. 41. 1753; Hook.f. Fl. Brit. India 6: 370. 1892; Hara Fl. East. Himal. 399. 1966; Babu Herb. Fl. Dehra Dun 526. 1977.

Vern.-' Jatiaw-wat ' (K).

Stems creeping, rooting below, highly branched, glabrous. Leaves 4-6 x 2-3 cm, ovate, obtuse or rounded at base, base abruptly narrowed into petiole; sheaths hairy, with oblique mouth. Cymes short peduncled, 1-3-flowered. Pedicels 2-4 cm long; spathes turbinate, 2-3 together, about 2 cm across, glabrous. Sepals unequal, green, dorsal one subobtuse, lateral ones suborbicular or rounded; petals 3, blue, with distinct claw and limb; fertile stamens 3, filaments bearded; staminodes 3, anthers indistinct; styles stout, coiled at the tip. Capsules trigonous.

Common both in shady and open areas especially in low altitudes along ditches, roadsides, etc.

Fls. & Frts. : April to November.

Specimens examined: Myrthong 1630 Dawki (Jaintia Hills).

Commelina diffusa N.Burman Fl. Ind. 18,t. 7, f. 2. 1768; Rolla Rao in Notes roy. Bot. Gard. Edinb. 25: 179. 1964; Hara Fl. East. Himal. 400. 1966; Babu Herb. Fl. Dehra Dun 526. 1977. - - C. nudiflora Linn. sensu Cl. in DC. Monogr. Phan. 3: 144. 1881; Hook.f. Fl. Brit. India 6: 369. 1892.

Vern.-'Jatiaw-wat' (K).

Stems diffuse, branched, rooting from lower nodes, glabrous. Leaves 4-8 x 1.5-3 cm, oblong, lanceolate, acuminate sheaths white, scale-like, hairy at the mouth; base narrowed into a short petiole, unequal sided. Spathes cordate at base, with long tail-like apex, up to 5 cm long. Cymes usually 2, 1-3-flowered; flowers about 1.5 cm across; sepals 3, white, membranous, orbicular; petals 3, unequal, blue with distinct claw. Stamens 6, 3 fertile and 3 sterile; anthers of the fertile filaments yellow and sagittate, while that of the sterile ones lobed. Capsules trigonous. Seeds tuberculate.

Common both in open and shrubby areas, in association with other herbaceous flora.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1086 Shillong, 1223 Cherra punjee (Khasi Hills); 1467 Hawakhana (Garo Hills).

Plate 6 Commelina paludosa Bl. A. Habit, B. Flower, C. Same with spathe open out, D. Bracteole, E. Sepal, F. Petal, G. Gynoecium with Androecium, H. Fertile and sterile Stamens, I. Pistil.

Commelina paludosa Bl. Enum. 1: 2. 1827; Rolla Rao Notes roy. Bot. Gard. Edinb. 25: 181. 1964; Hara Fl. East. Himal. 400. 1966; Babu Herb. Fl. Dehra Dun 527. 1977. - - C. obliqua Ham. ex D. Don Prodr. Fl. Nepal. 45. 1825 (Non Vahl. 1805); Hook.f. Fl. Brit. India 6: 372. 1892. (Plate 6).

Vern.- ' Patiau-wiat' (K).

Stems branched, glabrous, up to 3 meters high. Leaves 20 x 5 cm, lanceolate, acuminate, unequal at base; sheaths scale-like, white, with rufous hairs at the mouth. Cymes simple, terminal, blue, enclosed by a funnel shaped spathe. Spathes sessile, funnel-shaped, base cordate, pedicel about 1 cm long. Sepals about 5 mm long, unequal, membranous; petals 3, blue, about 1 cm long, with distinct limb and claw, claw broad, orbicular; stamens 6, fertile 3 with ovate anthers, yellow; sterile 3, with 4-5-lobed anthers, blue or black; styles equaling the fertile stamens, coiled at the tip. Capsules trigonous, ovoid. Seeds ellipsoid, compressed.

Common in wet places, along the banks of streams, rivers, etc.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1149 Shillong; 1222 Cherrapunjee.

Cyanotis D. Don

Creeping or suberect herbs. Leaves alternate. Inflorescence axillary or terminal scorpioid cymes with imbricating, folia-

ceous, falcate bracteoles. Flowers regular; sepals 3, subequal, connate at base or free; petals 3, subequal, connate up to the middle, clawed, blue or purple; stamens 6, all perfect; filaments bearded, often inflated towards the apex; anthers oblong; ovary 3-celled; ovules 2 in each cell; the upper erect and the lower pendulous; styles slender; stigmas subcapitate. Fruits 3-celled, loculicidal capsules. Seeds usually 2 in each cell, cubical or pyramidal, rugose.

KEY TO SPECIES

1a. Stems semierect, profusely branched from the base ; leaves usually green; seeds smooth. . cristata

1b. Stems creeping, very slender , sparingly branched; leaves usually pinkish; seeds reticulate. . . . . vaga

Cyanotis cristata (Linn.) D. Don Prodr. Fl. Nepal. 46. 1825; Hook.f. Fl. Brit. India 6: 385. 1892; Hara Fl. East. Himal. 400. 1966; Babu Herb. Fl. Dehra Dun 528. 1977. - - Commelina cristata Linn. Sp. Pl. 42. 1753.

Roots fibrous. Stems creeping, rooting from the lower nodes, profusely branched. Leaves sessile, 3-6 x 1 cm, lanceolate, subacute, sheathing at base. Spathes deflexed, about 5 x 1 cm; bracts foliaceous, ovate, cordate, 2-6 cm long. Flowers subsessile; sepals subequal, oblong, acute, hairy on the midrib, 4-6 mm long; petals 3, blue, spathulate, 6-8 mm, filaments bearded with blue hairs. Capsules trigonous. Seeds ribbed with a pair of pits on the faces.

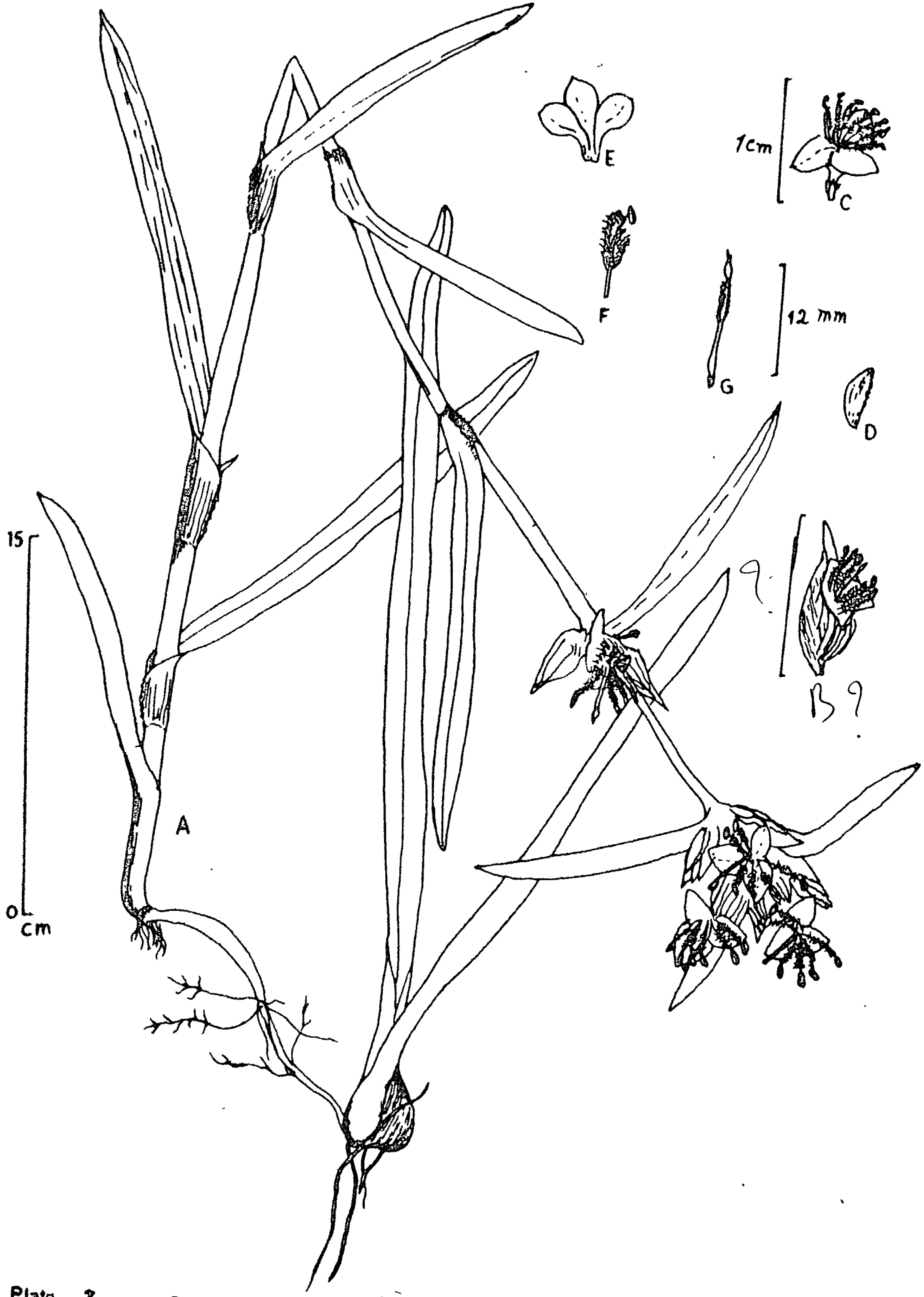

Plate 7. Cyanotis vaga (Lour.) J. A. & J. H. Schult. A. Habit, B. Flower in a bract, C. Flower, D. Sepal, E. Petals, F. Stamen, G. Pistil.

Common on walls and on the old road cuttings, in open areas as well as in the sparse forests, especially in teak and sal plantation. Commonly associated with grass species.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1629 Dawki (Jaintia Hills); 3014 Tasak (Garo Hills).

Cyanotis vaga (Lour.) (J.A.) et J.H. Schult. Syst. Veg. 7: 1153. 1830; Rolla Rao in Notes roy. Bot. Gard. Edinb. 25: 186. 1964; Hara Fl. East. Himal. 400. 1966; Babu Herb. Fl. Dehra Dun 529. 1977. - - Tradescantia vaga Lour. Fl. Coch. 1: 193. 1790. - - Cyanotis barbata D. Don Prodr. Fl. Nepal. 46. 1825; Hook.f. Fl. Brit. India 6: 385. 1892 (Plate 7).

Stems procumbent, developed from the base of the bulb. Leaves sessile 2-8 x 0.5-0.8 cm, linear, hairy, channelled acute, usually pinkish or greenish brown. Spathes condensed at the axils of leafy bracts. Flowers blue, cottony; sepals 3, membranous, 5 mm long; petals 3, subclavate, about 8 mm long, acute; filaments plumose, blue; anthers yellow; styles as long as the filaments; stigmas subcapitate. Capsules trigonous. Seeds reticulate.

Common in all types of forests especially in pine forests as well as in grassy areas and in abandoned cultivated lands. Often forms dense population and the whole area looks bluish when in bloom.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1017 Shillong; 1213 Cherrapunjee (Khasi Hills); 1308 Dawki (Jaintia Hills).

Floscopa Lour.

Floscopa scandens Lour. Fl. Coch. 1: 193. 1790; Hook.f. Fl. Brit. India 6: 390. 1892; Hara Fl. East. Himal. 401. 1966; Babu Herb. Fl. Dehra Dun 529. 1977.

Prostrate herbs. Stems glabrous, jointed. Leaves 4-12 x 2-4 cm, ovate-lanceolate, acuminate, glabrous; hairy at the sheaths only, cuneate at base, nerves convergent, midrib prominent. Sheaths 1-2 cm long, enclosing the stems above the nodes. Panicles villous or hirsute. Flowers secund, shortly pedicellate. Sepals 3, oblong, hairy; petals 3, free, pink, 0.5-0.6 cm long, connate at base, very hairy; stamens 6, with naked filaments; styles much longer than the perianth; ovules 1 in each locule. Capsule 2-seeded.

Common in marshes, along the banks of streams, rivers, etc., specially in shady areas.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1148 Shillong; 1259 Sohkha (Jaintia Hills).

Forrestia A. Rich.

Forrestia hookeri Hassk. Fl. 1864: 629. 1864; Hook.f. Fl. Brit. India 6: 384. 1892 (Plate 8).

Plate 8 Forrestia hookeri Hassk. A. Habit, B. Flower (vertical section) C Sepals, D. Petals, E. Stamen, F. Pistil.

Rhizomes prostrate. Stems stout, erect, jointed, 1-4 m high, hairy. Leaves crowded at the top, oblanceolate, acute, 30-40 x 8 cm, glabrous, narrowed into a petiole; petioles and sheaths hairy. Inflorescence crowded at the nodes, few flowered. Flowers sessile, pink. Calyx persistent, 6 mm long, fleshy, recurved, subequal; petals 3, subequal, 8 mm long, fleshy, white to pink on the dorsal surface; stamens 6, all fertile; filaments undulated, 8 mm long, bearded; anthers small, 2-celled, yellow; styles longer than the filaments, straight or bent only near the tip; stigmas truncate. Capsules trigonous, 1.5 cm long, canine-like.

Common in dense forests in warmer regions, in association with ferns and other herbaceous flora.

Fls. & Frts.: June to October.

Specimens examined: Myrthong 1941 Tura Peak.

Murdannia Royle

Slender, decumbent or prostrate herbs. Leaves cauline, sessile. Flowers regular, in terminal or axillary cymes, sometimes paniculate. Sepals and petals similar; stamens 6, inner 3 only fertile; connectives of the sterile stamens reduced or obsolete; filaments bearded; ovary 3-(2)-celled; styles hypogynous, stout; stigmas capitate. Capsules 3 or more seeded. Seeds usually with punctate hilum.

K E Y T O S P E C I E S

1a. Flowers corymbose or paniculate.
  2a. Roots fibrous; branches of panicles divaricate. . . . . spirata
  2b. Roots tuberous; branches of panicles otherwise.
    3a. Roots fascicled; branches of panicles erect, upper branches opposite or subwhorled. . . . . divergens
    3b. Roots not fascicled; branches of panicles effuse or spreading . . elata
1b. Flowers 1-3, in axillary cymes.
  4a. Panicles subterminal, few-flowered; perfect stamens 2; seeds rugose, pitted or tuberculate. . . . . nudiflora
  4b. Panicles terminal few-many flowered; perfect stamens 3; seeds compressed, subglabrous, echinous. . . . . giganteum

Murdannia divergens (Cl.) Bruck. in Engl. et Prant. Pfl.-fam. ed. 2, 15A: 159. 1930. - - Aneilema divergens Cl. Comm. Cyrt. Beng. t. 16. 1874; Hook.f. Fl. Brit. India 6: 376. 1892.

Roots fleshy, fascicled. Stems stout, erect, 60-80 cm high, branched upwards. Leaves subulate, 10-20 x 2-3 cm, subobtuse or rounded, base cordate or amplexicual; sheaths hairy; panicles few to many flowered. Branches opposite or whorled. Bracts ovate-lanceolate; bracteoles macrescent, persistent. Pedicels 5-10 mm long; flowers 5-8 mm across, purplish blue; sepals 3, 5 mm long, pale green; petals 3, clawed, purplish blue; stamens 6, 3 only fertile; filaments bearded,

equalling the sepals; styles short equaling or slightly exceeding the filaments; stigmas truncate. Capsules 5-7 mm acute at both ends.

Common under [illegible] pine forests, in association with other herbaceous plants. Flowers contain a sort of sticky mucilaginous material.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1081 Shillong.

Murdannia elata(Vahl) Bruck. in Engl.Pfl.-fam. ed. 2, 15A: 173. 1930; Hara Fl. East. Himal. 401. 1966. - - Commelina elata Vahl, Enu. 2: 178. 1806. - - C. lineolata Bl. Enum. Pl. Java. 1: 3. 1827; Hook.f. Fl. Brit. India 6: 376. 1892.

Roots slender, tuberous. Stems erect, simple or branched, 30-50 cm high. Leaves sessile, broad, 10-15 x 3-4 cm, acute, oblique, lanceolate, base cuneate or rounded, sheaths hairy, shortly encircling the internodes. Panicles ascending, branched. Bracts ovate, leafy, about 2 cm long; bracteoles macrescent; pedicels 5-10 mm long, stout; flowers pinkish-white, 8 mm across; sepals 3, ovate, acute, 7 mm long; petals 3, orbicular, pink or white; stamens 6; 3 only fertile; filaments bearded; styles short, linear, truncate. Capsules about 8 mm long, mucronate, shining.

Common undergrowth in all types of forests.

Fls. & Frts. : May to October.

Specimens examined: Myrthong 1694 Burnihat(Khasi Hills);

1951 Tura; 1972 Baghmara; 1989 Tasak; 2919 Rongjeng (Garo Hills).

Murdannia giganteum (Vahl.) Bruck. in Engl. et Prant. Pfl.-fam. ed. 2,15A: 173. 1930. - - Aneilema giganteum R. Br. Prodr. 271. 1810; Hook.f. Fl. Brit. India 6: 379. 1892.

Roots fleshy, white. Stems erect, internodes up to 20 cm long. Leaves sessile, linear, 30 x 0.6 cm, acuminate, glabrous, hairy on the sheath. Flowers pinkish-white or blue. Sepals 3, membranous, orbicular, persistent, 5 mm long; petals 3, pinkish, 5-6 x 4-5 mm ; perfect stamens 3; filaments bearded; ovary 3-celled; styles naked. Capsules oblong, elliptic, mucronate. Seeds echinous, brown.

Common in grassy areas, specially in moist places.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1140 Shillong; 1254 Cherrapunjee.

Murdannia nudiflora (Linn.) Brenan, in Kew Bull. 7: 189. 1952; Hara Fl. East. Himal. 401. 1966; Babu Herb. Fl. Dehra Dun 530. 1977. - - Commelina nudiflora Linn. Sp. Pl. 41. 1753; Hook.f. Fl. Brit. India 6: 369. 1892. - - Aneilema nudiflorum (Linn.) Wall. Cat. 5224. 1830.

Diffuse, slender herbs, with fibrous roots. Stems highly branched, rooting from the lower prostrate nodes. Leaves 1-3 x 0.5 cm, ovate or linear-lanceolate, glabrous; sheaths hairy, hyaline. Flowers regular, bisexual, purplish or yellow; sepals

3, suborbicular, hyaline, about 3 mm long; petals 3, pinkish blue, larger than the sepals; fertile stamens 2; sterile or staminodes 3, 1 reduced into naked bearded filament; styles 1, equalling the petals. Capsules trigonous, enclosed within the persistent calyx. Seeds tuberculate.

Common in open areas along the ditches and in abandoned cultivated lands, in association with grasses.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1063 Shillong; 1918 Agarobadha (Garo Hills).

var. terminalis

Suberect herbs. Stems prostrate, rooting at lower nodes, much branched . Leaves sessile, 2-4 x 1 cm, oblong, acute. Sheaths short. Inflorescence axillary. Flowers in terminal as well as axillary peduncles, bisexual, pedicellate. Sepals 3, obconic, persistent, green; petals 3, yellow, longer than the sepals and alternating with them; stamens 3, filaments bearded; styles short; stigmas truncate. Capsules 3-seeded, acuminate.

Common in forests and near ditches in association with grasses and sedges, especially in rocky areas.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1244 Mawmluh (Khasi Hills); 1260 Sohkha (Jaintia Hills); 3017 Tasak (Garo Hills).

Murdannia spirata (Linn.) Bruck. in Engl. Pfl.fam. ed. 2, 15A: 173. 1930; Mara Fl. East. Himal. 402. 1966; Babu Herb. Fl. Dehra Dun 531. 1977. - - Commelina spirata Linn. Mant. Pl. 2: 176. 1771. - - Aneilema spiratum (Linn.) R. Br. Prodr. Nov. Holl. 271. 1810; Hook.f. Fl. Brit. India 6: 377. 1892.

Roots fibrous. Stems 5-20 cm high, profusely branched from below, grass-like. Leaves 2-4 x 0.4-0.6 cm, glabrous, linear, subacute. Sheaths hyaline, membranous. Inflorescence a terminal panicle, few flowered. Branches divaricate, few flowered. Bracts ovate, persistent. Sepals 3, membranous, orbicular or rounded; petals 3, shortly clawed, pink; stamens 6, fertile 3 and sterile 3; filaments naked; ovary 3-celled; styles stout, short; stigmas capitate. Capsules oblong or subglobose, 3-7-seeded. Seeds smooth.

Common in paddy fields and in grasslands especially in abandoned cultivated lands, in association with grasses.

Fls. & Frts. : August to November.

Specimens examined: Nyrthong 1063 Shillong; 1918 Agarobadha (Garo Hills).

Pollia Thunb.

Large herbs. Flowers regular, in paniculate cymes. Sepals free, persistent; petals free; stamens 6, all fertile; ovary 3-celled, ovules anatropous, many in each cell, arranged in 2 rows; styles slender, stout; stigmas truncate or subcapitate. Capsules globose. Seeds flat, pyramidal or cuneate, subangular or compressed.

K E Y T O S P E C I E S

1a. Leaves crowded towards the apex; flowers in umbellate, paniculate cymes. . . . . subumbellata

1b. Leaves otherwise; flowers in erect racemes. . . . . hasskarlii

Pollia hasskarlii Rolla Rao in Notes roy. Bot. Gard. Edinb. 25: 188. 1964. - - P. aclisia Hassk. Comm. Ind. 55. 1870.

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Stems up to 2 m high, jointed; nodes swollen with dry scales; internodes shorter towards the apex and completely clothed with overlapping sheaths. Leaves crowded towards the apex, blade 20-26 x 3-5 cm, lanceolate, apex acute; base narrowed into a sheathing petiole. Panicles terminal. Peduncles stout, about 6 cm long, hairy, bracteoles membranous, amplexicual. Pedicels stout, 0.5-1 cm long, hairy. Flowers white. Sepals 3, orbicular or ob-orbicular, green; petals orbicular, with distinct claw and short limb; stamens 6, 3 only perfect; filaments filiform; anthers 2-celled, yellow; styles short, stout with truncate stigmas. Capsules globose, 5 mm across, deep blue, shining. Seeds flat, subangular.

Rare, occurs in shady areas along the banks of streams, in association with herbaceous plants.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1943 Tura Peak.

Pollia subumbellata Cl. in Journ. Linn. Soc. Bot. 11: 451. 1870; Hook.f. Fl. Brit. India 6: 368. 1892.

Stems creeping and rooting at base. Leaves crowded towards the apex, ovate-lanceolate, pointed at both ends, obscurely 7-11-nerved; blades 8-12 x 4-5 cm; petioles 0.5-2 cm long; sheaths closed, hyaline, glabrous. Inflorescence an umbellate panicle, in between the leaves at the apex of stems. Flowers regular, white. Sepals 3, green or whitish green, membranous; petals 3, white, clawed, rounded; stamens 3, perfect; filaments as long as the petals; ovary 3-celled, many ovuled; styles slender; stigmas subcapitate. Capsules globose, many seeded, crustaceous. Seeds pyramidal or cuneate, compressed.

Common in forests on the cut edges of roadsides, in association with herbaceous plants.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1924 Way to Tura Peak.

The following species are also cultivated in various parts of Meghalaya for their coloured leaves and showy flowers:-

1. Rhoeo discolor Hance. Leaves pink or variegated, with or without distinct longitudinal strips.

2 Zebrina pendula Schnitzl. Leaves purple or pink below, silvery green above.

ERIOCAULALES

Eriocaulaceae

Desvaux Ann. Sci. Nat. 13: 45. 1828 (Eriocauloneae).

Annual or perennial, scapigerous, marshy or aquatic herbs. Scapes usually ribbed, twisted. Leaves radical, tufted. Flowers very small, unisexual in globose heads, at the apices of the scapes, subtended by imbricating, involucral bracts or pelicles. Flowers densely packed on a flat, convex, hemi-spherical or conical receptacle, each floret developing at the axil of a bract; sepals 2-3, sometimes with lobes or appendages; petals 2-3, equal or unequal, often very obscure, inserted on the top of a clavate, elongated stipe; male flowers : stamens 6 or fewer; anthers 2-4-celled, basifixed, sometimes stamens of the outer whorls suppressed; female flowers: carpels 3; ovary superior, 3-(2-)-celled; ovules solitary in each cell, pendulous, orthotropous. Fruits 2-3 loculicidal capsules. Seeds minute, oblong, ellipsoid or globose, smooth, striated or ribbed.

Eriocaulon Linn.

Characters of the Family.

K E Y T O S P E C I E S

1a. Plants entirely submerged; leaves linear or acicular; scapes radiating above . . . . *setaceum*

1b. Plants marshy or terrestrial, if submerged the stems very short, not more than 4 cm high.

2a. One of the male petals largest and produced beyond the floral bracts.

3a. Receptacles glabrous or nearly so; petals with large glands. . . . cristatum

3b. Receptacles villous; petals glandular or not.

4a. Sepals and petals subequal; petals hairy all over with a large gland below the apex. . . . . miserum

4b. Sepals twice or thrice larger than the petals; petals with a tuft of hairs at the apex; glands obsolete or absent. . . . . mitophyllum

2b. All petals of male flowers subequal, or if slightly larger, not produced beyond the involucral bracts.

5a. Involucral bracts woolly or hairy; receptacles villous.

6a. Plants filiform, less than 1 mm in diameter; heads globose or hemispheric without depressions in the centre . . . . . infirmum

6b. Plants robust, more than 1 mm in diameter; heads globose with a depression in the centre.

7a. Plants hairy all over. . . . . brownianum

7b. Plants glabrous. . brownianum var. latifolium

5b. Involucral bracts glabrous or nearly so.

8a. Floral bracts glabrous.

9a. Receptacles glabrous or sparsely hairy.

10a. Petals glabrous, spathulate with a black gland at the apex. . . . alpestre

10b. Petals hairy all over, oblanceolate or obovate. . . . . truncatum

9b. Receptacles more or less villous. . . oryzetorum

8b. Floral bracts bearded, villous or pubescent.

11a. Receptacles glabrous or sparsely hairy.

12a. Leaves broadly subulate; heads grey; involucral bracts cuneate-obovate, recurved. . . . . .nepalense

12b. Leaves slender, flexuous; heads hemispheric or globose, white; involucral bracts spreading or erect, coneiform, black. gregatum

11b. Receptacles villous.

13a. Female flowers distinctly pedicelled.

14a. Heads many flowered; sepals tipped with bristles; receptacles conic or columnar. . . . . luzulaefolium

14b. Heads few flowered; sepals with bristles at the tip; receptacles hemispheric. . . . . achiton

13b. Female flowers sessile. . . . . sollyanum

Eriocaulon achiton Koern. in Linnaea 26: 630. 1854; Hook.f. Fl. Brit. India 6: 584. 1893; Fyson in Journ. Ind. bot. Soc. 2: 202. 1921; Rao & Verma in Bull. bot. Surv. India 18(1-4): 48. 1976; Moldenke in Phytologia 41(6): 412. 1979.

Vern.- 'Betthiatrit' (?).

Scapes capillary, 4-8 cm high, twisted, dark olive grey. Leaves 2-3 x 0.1-0.2 cm, acute, glabrous. Heads obconic or hemi-spheric, 3-6 mm across, pale green. Male flowers linear

about 1.5 mm long; sepals 1, lanceolate, glabrous, acute; petals 2, linear-lanceolate, developed above the sepals in a stalk-like staminal column, glabrous, glandular near the tip or sometimes the gland is indistinct; stamens 2, raised above in a staminal column far from the point of petal attachment; column expanding or petal-like. Female flowers: equaling the males; sepals 2, linear, deflected, glabrous, hairy at the base of the stalk only; petals 2 or 0, stalk-like below and expanding above with glandulous hairs at the apex and a gland below the tip. Ovary 3-celled, flacid, Seeds minute. shining.

Common in paddy fields and in stagnant waters, on mossy rocks. The species sometimes exhibit vivipary.

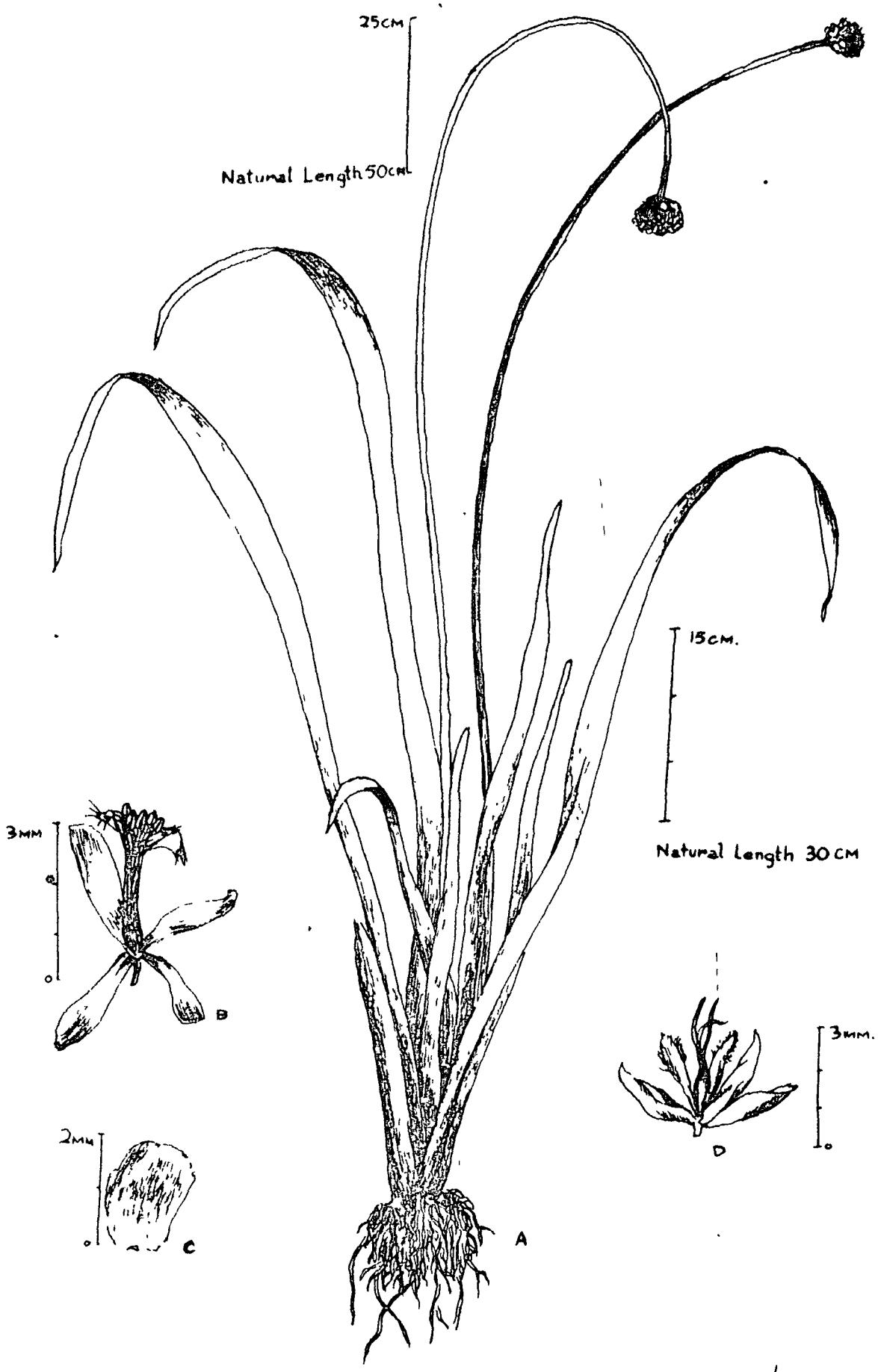
Fls. & Frts. : July to November.

Specimens examined: Myrthong 1893 Cherrapunjee; 3070 Nongpoh.

Eriocaulon alpestre Hook.f.et Thoms. ex Koemn. in Miq. Ann. Mus. Lugd. Batav. 3: 163. 1867; Hook.f. Fl. Brit. India 6: 578. 1893; Fyson in Jorn. Ind. Bot. Soc. 3: 12. 1922; Rao & Verma in Bull. Bot. Surv. India 18(1-4): 45, 1976.

Vern.-'Batthiat' (K).

Rootstock short, fleshy, white. Scapes 6-15 x 0.1-0.2 cm erect, sheaths to more than half of each scape. Leaves subulate, subobtuse, glabrous, radical, 6-12 x 0.5-0.8 cm. Heads obconic, 2-4 mm across, with few flowers. Flowers unisexual; female flowers sessile about 3 mm long; petals 3, fleshy, white,



Ptate 9 Eriocaulon brownianum Mart. A. Habit, B. Male flower, C. Outter involucral bract, D. Female flower.

racket- shaped, apex with a gland. Ovary 3-celled; styles long, filiform. Male flowers: sepals 2-3, adnate at the base, broad; petals united in a staminal tube; stamens 6. Capsules 3-celled. Seeds minute, yellow or brown.

Common in marshy places and in paddy fields after harvesting, lower portion usually remains submerged in water.

Fls. & Frts. : May to October.

Specimens examined: Myrthong 1775 Shillong.

Eriocaulon brownianum Mart. in Wall. Pl. As. Rar. 3: 25, t. 248. 1832; Hook.f. Fl. Brit. India 6: 576. 1892; Fyson in Journ. Ind. bot. Soc. 2: 138. 1921; Rao & Verma in Bull. bot. Surv. India 18(1-4): 44. 1976; Moldenke in Phytologia 41(6): 415. 1979(Plate 9).

Vern.-' Ratthiatshrah or Rnaimasi ' (K).

Tall, slender herbs. Scapes 40-60 x 0.2-0.3 cm, developed from the stout rootstock, ribbed, glabrous or pubescent. Leaves many, radical, long, about 30-40 x 0.8-1 cm, ensiform, acuminate, hairy. Heads globose or spherical, snow white, about 1 cm across; outer involucral bracts 2 mm long, finely toothed, acuminate; male flowers 3mm long; sepals 3, large,recurved,at length glabrous, blackish or olive grey, with few glandular hairs at the apex; petals 3, united with staminal tube, ciliate at the apex with black gland near the tip; stamens 3-6; female flowers linear, 2-3 mm long, sepals 2-3, glabrous, cymbiform or boat-shaped, with few glandular hairs near the tip; petals

2, very hairy with gland near the tip; carpels 3, terminal; styles filiform. Capsules 3-celled.

Common in marshy areas, in embankments and in water channels.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1022 Shillong.

var. latifolium Moldenke in Phytologia 36: 473-474. 1977 et in 41(6): 415. 1979.

Rootstock bulbous, roots tufted, white, fibrous. Scapes 20-40 cm high, solitary, ribbed. Leaves as long as the scapes, glabrous, obtuse. Heads hemi-spheric, snow white, 1 cm across, with depression in the centre. Outer involucral bracts spreading, pale, lobed, 3 x 3 mm, sometimes pale black towards the tip. Male flowers subtended by the spathulate bracts; petals 3, with hairs at the deltoid tip; stamens 6; anthers black, elliptic. Female flowers: sepals 3, minute, 1 mm long, ciliate at the tip; carpels 3, styles short.

Common in marshes and in paddy fields. Also grows along water channels, ditches, etc., in shady areas.

Fls. & Frts. : March to November.

Specimens examined: Myrthong 1325 Shillong; 1593 Jowai.

Eriocaulon cristatum Mart.in Wall. Pl. As. Rar. 3: 28. 1832; Hook.f. Fl. Brit. India 6: 574. 1893; Fyson in Journ. Ind. bot. Soc. 2: 312. 1921; Rao & Verma in Bull. bot. Surv. India 18(1-4): 44. 1976;

Vern.- Batthiatlum (K).

Scapes tufted, rigid, 10-20 cm high, twisted, ribbed. Leaves erect, radical, 5-10 x 0.1-0.2 cm, deep green, narrowly linear. Heads globose, snow white, 2-5 mm across, with scarious outer involucral bracts. Male flowers pedicelled, 2-3 mm across; sepals 3, with glandulous hairs at the apices; petals 3, united in a staminal column, 1 larger with snow white glandulous hairs and black gland near the middle; 2 lateral petals smaller, with tufts of glandulous hairs, a gland at the tip; stamens 6, at the base of the petals; filaments short; anthers 2-celled, spherical or elliptical. Female flowers 1 mm across; sepals 3, with few glandulous hairs near the tip, spathulate, with irregular veins; petals 2-3, much smaller than the sepals, glandular near the tip. Seeds minute.

Common both in open and shady areas in marshy places during rainy seasons in association with grasses and sedges.

Flo. & Frts. : July to December.

Specimens examined: Myrthong 1021, 1743, 1758 Shillong; 1203 Cherrapunjee; 1770 Smit; 1790 Pariong (West Khasi Hills).

Eriocaulon gregatum Koern. in Linnaea 27: 606. 1856; Hook.f. Fl. Brit. India 6: 581. 1893; Fyson in Journ. Ind. bot. Soc. 2: 198. 1921; Rao & Verma in Bull. Bot Surv. India 18(1-4): 47. 1976.

Vern.- ' Batthiat-ktieh ' (K).

Rhizomes 0. Scapes twisted, ribbed. Leaves radical, linear, 1-4 x 0.5 cm, deep green. Heads globose, 2-5 mm across; involucral bracts black with white flowers. Receptacle glabrous. Male flowers: sepals 3, short, broad, with tufts of glandulous hairs at the tip, about 1 mm long; petals 3, indistinct or reduced into hairy membrane with a black gland near the tip, petals not exceeding the stamens; stamens 6, crowded on the tip of the short staminal column above the petals; anthers globose, 2-celled; filaments longer than the anthers. Female flowers: 3 mm across, linear; sepals 3, 1.5-2 mm long, with a tuft of dense hairs at the tip; petals 3, with stalk-like base, and glandular hairy apex, about 2 mm long; carpels 3, filiform, shorter than the petals, with blackish stigmas. Seeds broadly oblong.

Common on muddy rocks in the bed of streams or rivers.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1051 Shillong.

Eriocaulon infirmum Steud. Syn.Pl. Cyp. 272. 1855 ; Moldenke in Phytologia 41(6): 422. 1979.

Annual herbs. Scapes twisted, 15-30 cm high, ribbed. Leaves subulate, 2-5 x 0.2 cm, subacute. Heads globose, black, outer involucral bracts spreading, pale. Male flowers: sepals 3, with sparse hairs at the tip, 1-1.5 mm long; petals 3, united with staminal tube and spreading above, acute eglandular; stamens 6, adnate to the base of the petal lobes, or free; anthers elongated. Female flowers: 1.5 mm across; sepals 3, cymbiform, narrowed towards the base, hairy at the tip; petals 3, linear, hairy with a black gland below the tip; carpels 3, styles free, filiform, exceeding the petal lobes; ovary 3-celled. Capsules 3-celled, turgid. Seeds minute.

Common in marshes both in open and shady areas in association with grasses and sedges.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1056 Shillong.

Eriocaulon luzulaefolium Mart. in Wall. Pl. As. Rar. 3: 28. 1832; Hook.f. Fl. Brit. India 6: 582. 1893; Fyson in Journ. Ind. bot. Soc. 2: 200. 1921; Rao & Verma in Bull. bot. Surv. India 18(1-4): 47. 1976; Moldenke in Phytologia 36: 481. 1977 et in 41(6): 425. 1979.

Vern. - Batthiat (K).

Scapes 10-20 cm high, flexuous, shining, twisted, ribbed. Leaves subulate, 5-10 x 0.5 cm, glabrous. Heads globose, 4-6 mm across, truncate, clasping below by light brown, obtuse, saucer-shaped involucre. Male flowers linear, 2 mm across;

sepals 3, linear, sparsely glandulous hairs above, narrowed to the base; petals 3, united into a staminal column, ciliate; stamens 6, short; anthers sagittate or spherical, acute. Female flowers very hairy; sepals 3, broad, cymbiform, intermixed with long hairs; petals 3, without a distinct stalk, inbetween sepals and petals, much smaller than sepals, hairy, eglandular; carpels 3, styles long, filiform, equalling the petals; ovary 3-celled. Seeds minute.

Common in marshes and in paddy fields, in association with grasses and sedges.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1211 Mawmluh (Khasi Hills).

Eriocaulon miserum Koern. in Linnaea 27: 609. 1856; Hook.f. Fl. Brit. India 6: 575. 1893; Fyson in Journ. Ind. bot. Soc. 3: 14. 1922; Rao & Verma in Bull. bot. Surv. India 18(1-4): 44. 1976; Moldenke in Phytologia 41(6): 427. 1979.

Vern.-' Batthiat-maw ' (K).

Scapes very short, 4-6 cm high, branched at the base; leaves capillary, sheathing at base, blade narrowed, 5-15 x 0.1 -0.2 cm; heads globose, white, 0.5-1 cm across; outer involucral bracts orbicular, obtuse, pale brown. Male flowers, 2 mm long, stalked; sepals 2-3, subequal, broader at the apex, with glandular hairs; petals 3, very short, ciliate, united in a long staminal column, gland absent; stamens 6, filaments very long, curved; anthers 2-celled. Female flowers about 2.5 mm long; sepals 3, truncate, lanceolate, with few hairs at the

tip, about 1.5 mm long, cymbiform; petals 3, hairy, linear, 2.5 mm long, with black gland near the tip; carpels 3, filiform, longer than the petal lobes. Seeds minute.

Common on grass-covered rocks in rivers or streams.

Fls. & Frts. : December to February.

Specimens examined: Myrthong 1379 Umtru (Khasi Hills); 1476 Garupani (Jaintia Hills).

Eriocaulon nitophyllum Hook.f. Fl. Brit. India 6: 575. 1893.

Vern.-' Batthiet-long-rit ' (K).

Rhizomes short, with fibrous roots. Scapes many, 6-25 cm high. Leaves filiform, 4-6 x 0.1 cm. Heads globose or hemi-spherical, about 5 mm across; outer involucral bracts spreading, pale, sometimes appearing black, due to the black inner involucral bracts. Male flowers about 1 mm long, linear, black; sepals 3, black, truncate, bearded; petals 3, subequal or one largest, united with staminal column, eglandular; stamens 6; filaments shorter than the petals; anthers 2-celled. Female flowers: equal to the males; sepals 3, with long hairs at the tip; petals 1-3, one larger or all equal, glandular near the tip and in the middle, very hairy; carpels 3; styles longer than carpels; ovary 3-celled. Seeds minute.

Common on boulders or rocks along the banks of streams or rivers.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1191 Shillong.

Eriocaulon nepalense Presc. ex Bong. Act. Petrop. Sc. Math. 4, 1: 610. 1831; Hook.f. Fl. Brit. India 6: 581. 1893; Fyson in Journ. Ind. bot. Soc. 2: 198. 1921; Satoke in Hara, Fl. East. Himal. 2 rep. 158. 1971; Rao & Verma in Bull. bot. Surv. India 18(1-4): 47. 1976.

Vern.-' Batthiat-ktieh ' (K).

Rootstock small. Scapes elongated, 5-25 cm high, many ribbed, spirally arranged. Leaves radical, subulate, 2-8 x 0.2-0.5 cm, glabrous. Heads globose, white, tinged with black; involucral bracts cuneate, scarious. Male flowers about 1 mm long; sepals 3, or sometimes 2, linear, glabrous; petals 3, united with staminal column, not exceeding the stamens; stamens 6, condensed at the apex of the staminal column; filaments short; anthers 2-celled. Female flowers about 1 mm long, linear, sepals 3, linear, glabrous, membranous; petals 3, smaller than the sepals, acute, glabrous; carpels 3; styles filiform, equal to the petals; ovary 3-celled, with many ovules in each cell.

Common in open, marshy places and on rocks in streams or rivers.

Fls. & Frts. : January to April.

Specimens examined: Myrthong 1433 Baghmara, 1466 Tura (Garo Hills); 1561 Umling (Khasi Hills); 1962 Jowai (Jaintia Hills).

Eriocaulon oryzetorum Mart. in Wall. Pl. As. Rar. 3: 28. 1832; Hook.f. Fl. Brit. India 6: 579. 1893.

Vern.-' Batthiat-nur-um ' (K).

Rootstock stout, [illegible]. Scapes 20-35 x 0.1-0.2 cm, twisted, ribbed. Leaves radical, short, 4-5 x 0.3-0.6 cm, glabrous. Heads globose, small, white with shining pelicles. Receptacles glabrous. Male flowers: sepals 2, hairy; petals 3, minute, ciliate; stamens 6; anthers black. Female flowers: sepals 3; petals 3, very hairy, expanded above and tapering gradually towards the limb; carpels 3; filifrom longer than the petals. Ovary 3-celled.

Common along the banks of streams, specially in deposited soil. Hooker (op. cit) states that the plants have short rootstocks but our specimens [illegible] have long creeping rootstocks.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1491 Umroi (Khasi Hills).

Eriocaulon setaceum Linn. Sp. Pl. 87. 1753; Hook.f. Fl. Brit. India 6: 572.1893; Fyson in Journ. Ind. bot. Soc. 2: 193. 1921; Rao & Verma in Bull. bot. Surv. India 18(1-4): 43. 1976. (Plate 10).

Vern.-' Batthiat-shniuh '(K).

Tufted herbs. Scapes flexuous, floating or submerged, branched, length variable depending on depth of water, scapes radially developed at the apex of the stems; stems spirally clothed with capillary or needle-like leaves. Leaves minute, numerous developing right from the base of the stems, sheathing

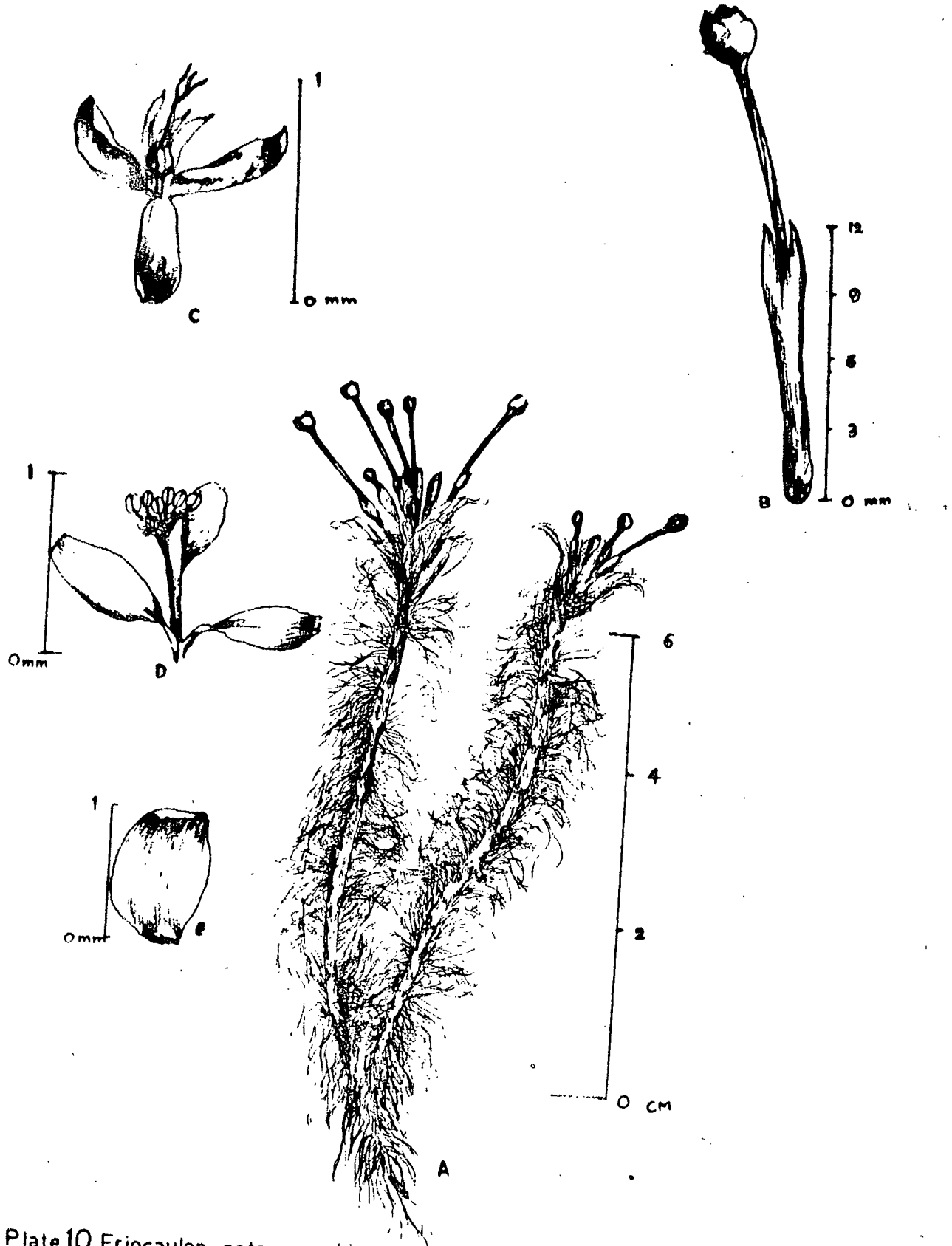


Plate 10 Eriocaulon setaceum Linn.. A. Habit, B. Inflorescence, C. Female flower, D. Male flower, E. Pelicle.

to the middle of the scapes. Heads globose, 1-3 mm across; outer involucral bracts 2-lobed, recurved, pale yellow. Male flowers: sepals 3, about 1 mm long, glabrous; petals 3, united with staminal column, not exceeding above the stamens; stamens 6, condensed at the base of the petals or embedded in the petal lobes. Female flowers about 1 mm long; sepals 3, broad, oblique glabrous; petals 3, linear, 1 larger, glabrous; carpels 3, filiform, free; ovary 3-celled.

Rare, collected only in Barapani area in rivulets on the way to Umroi and on the submerged bank of the damp.

Fls. & Frts. : August to November.

Specimens examined: Lyrthong 1091 Barapani.

2.

Eriocaulon sollyanum Royle, Ill. 409. t. 97. f. 1, 1839; E. trilobum Ham. ex Hook.f. Fl. Brit. India 6: 583. 1893.

Vern.-' Batthiat-kba ' (K).

Roots fibrous, white, Scapes 2-20 cm high, ribbed. Leaves 6 x 0.6 cm, radical, broad, subulate, lanceolate, oblong, obtuse. Heads globose, black, 4-6 mm across; outer involucral bracts, shining. Male flowers, pedicelled; sepals 2, connate at base, about 1 mm long, with few hairs near the tip; petals 3, united at the base and spreading above, very short, intermixed with stamens; stamens 6; anthers very prominent, black, 2-celled; filaments indistinct. Female flowers about 1.5 mm long; sepals 3, membranous, black, with sparse hairs at the margin; petals 3, linear-lanceolate, with a minute black gland near the tip; carpels 3; styles filiform, as long as the petals; ovary 3-celled,

turgid.

Common in marshes along the bank of streams or occasionally on flooded areas, especially on black soils.

Fls. & Frts.: August to September.

Specimens examined: Lyrthong 1239 Cherrapunjee.

Eriocaulon truncatum Ham. ex Wall. Pl. As. Rar. 3: 29. 1832; Hook.f. Fl. Brit. India 6: 578. 1893; Fyson in Journ. Ind. Bot. Soc. 2: 199. 1921; Rao & Verma in Bull. Bot. Surv. India 13(1-4): 45. 1976.

Vern.- 'Ratthat phlan' (K).

Scapes numerous, 5-15 x 0.1 cm. Leaves subulate, 4-8 x 0.4 cm, obtuse. Heads globose, pale; involucral bracts shining, as long as the heads. Male flowers about 1 mm long, linear; sepals 2-3, linear, blackish-grey or olive grey; petals 3, connate to the staminal column, shorter than the stamens; stamens 6, filaments longer than the petals and distinct; anthers black, 2-celled. Female flowers linear, about 1 mm long, with a columnin between sepals and petals; sepals linear, glabrous; petals 3, glabrous, connate at the base or developing at the apex of the staminal column, carpels 3, shorter than the petals, free; ovary 3-celled.

Common in marshes and in ditches, specially on sandy soils.

Fls. & Frts. : October to December.

Specimens examined: Lyrthong 1460 Tura; 1965 Bagmara (Garo Hills).

JUNCALES

Juncaceae

A. L. de Juss. Gen. Pl. 43. 1789.

Perennial or rarely annual herbs. Stems tufted. Leaves radical, flat, terete or reduced to sheaths. Flowers bisexual, small, regular in axillary or terminal cymes, panicles or corymbs. Bracts small, leafy. Perianth 6, in 2-series, free or connate below, persistent, imbricate; stamens 6, rarely 3, adnate to the base of the perianth lobes; filaments filiform; anthers basifixed; carpels 3; styles long or 0, ending in 3 plumose stigmas; ovary 1-3-celled, superior; ovules 3 or many. Fruits 1-3-celled capsules. Seeds erect, testa produced at both ends.

K E Y T O G E N E R A

1a. Leafsheaths open; ovary many ovuled. . . Juncus
1b. Leafsheaths closed; ovary 3-ovuled . . . Luzula

Juncus Linn.

Glabrous, perennial herbs. Leaves flat or reduced to sheaths; sheaths open. Flowers small, clustered or fascicled in terminal cymes or heads. Perianth 6, with scarious margins; stamens 6, rarely 3; anthers oblong or linear. Carpels 3; ovary 1-3-celled, cells many ovuled. Capsules 3-valved. Seeds ovoid, testa striated, reticulate or transversely lineate.

K E Y T O S P E C I E S

1a. Stems branched in the upper portion; leaves present; inflorescence a terminal cyme with more than 1 head.

2a. Stems grooved; flowers up to 2 cm across; tepals whitish . . . . **khasiensis**

2b. Stems not as above; flowers less than 2 cm across; tepals brownish green.

3a. Stems rooting in the lower nodes; leaves not septate. . . **prismatocarpus**

3b. Stems not rooting in the lower nodes; leaves distinctly septate. . . . . **leptospermus**

1b. Stems unbranched; leaves 0; inflorescence a solitary, subterminal, effuse panicle. . . **effusus**

Juncus effusus Linn. Sp. Pl. 326. 1753; Hook.f. Fl. Brit. India 6: 392. 1892, Satake in Hara Fl. East. Himal. 402. 1966.

Vern. Lamsyrput ' (K).

Rhizomes creeping. Stems 50-150 x 0.1-0.3 cm, cylindrical, filled with white pith throughout the length. Leaves reduced to sheaths; basal sheaths deep brown. Inflorescence a subterminal, effuse panicle, with pendulous branches, developing near the tip, a few cymes below the apex. Flowers about 2 mm across. Perianth 6, outer segments 2-3 mm long, acute; inner segments 3, equal to the outer segments; stamens 3, adnate to the base of the inner segments of perianth; anthers yellow; carpels 3; styles 0; ovary 3-celled. Fruit trigonous. Seeds numerous, elliptic, black, less than 1 mm long.

Common in marshy areas, along water channels etc. The cylindric culms are used for making hats, baskets and also for making targets by the archers.

Fls. & Frts. : March to December.

Specimens examined: Nyrthong 1514 Shillong; 1971 Jowai; 1026 Somsak (Garo Hills).

Juncus khasiensis Buch. in Bot. Jahrb. 12: 407. 1890; Hook.f. Fl. Brit. India 6: 399. 1892; Rao & Verma in Bull. bot. Surv. India 18(1-4): 5. f. 4. 1976.

Tufted herbs. Stems 10-30 cm high, grooved. Leaves radical, 5-15 x 0.2-0.4 cm, channelled, hairy, apex acute. Cymes usually 2, sessile, white, bracts 3-4, ovate, acute, longer than the sessile heads; perianth 6; outer 3 keeled, 6 mm long; inner 3, 5 mm long, margin membranous, white; stamens 6, exserted; filaments 4.5 mm long, slender; anthers 2-3 mm long, 2-celled; style slender, exserted; stigmas short. Capsules 1-celled. Seeds ovate, ribbed.

Rare, collected only once from Laitlyngkot in Khasi Hills, on the soil covered rocks. Mainly associated with grasses.

Fls. & Frts.: August to September.

Specimens examined: Nyrthong 2954 Laitlyngkot (Khasi Hills).

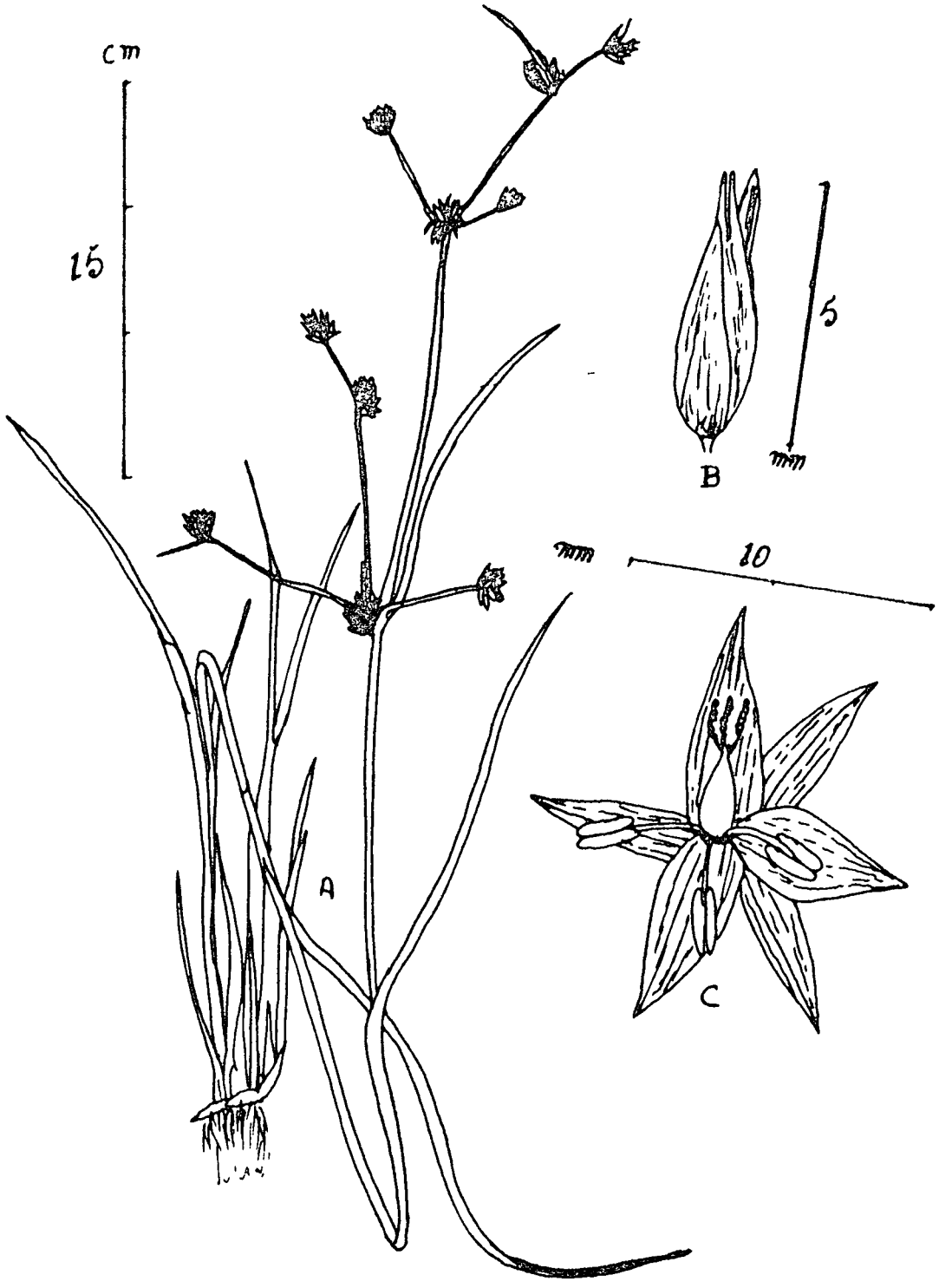


Plate 11 Juncus prismatocarpus R.Br., A.Habit, B.Flower, C.Same open out (top view).

Juncus leptospermus Buch. in Engl. bot. Jahrb. 6: 203. 1885; Hook.f. Fl. Brit. India 6: 396. 1892.

Rhizomes stout, prostrate, white. Stems slightly compressed, septate, up to 1 m high, base up to 1 cm across including sheaths. Leaves scape-like, twice as long as the scapes, broad and sheathing at base, glabrous, subacute, septate. Flowers bisexual, terminal or axillary, in fascicles. Perianth 6, in 2-series; outer 3, 2-4 mm long, acute, with distinct midrib, sparsely spotted; inner segments 3, shorter than the outer ones; stamens 3, all fertile or reduced into bristles or strap-shaped structures; anthers about 3 mm long, penicellate; carpels 3; styles coiled; ovary 1-celled. Seeds fusiform, pointed at one end, testa close.

Rare, collected only once from Shillong, in marshy places in pine forest, mainly associated with ferns and grasses.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 1530 Shillong.

Juncus prismatocarpus R. Br. Prodr. 259. 1810; Hook.f. Fl. Brit. India 6: 395. 1892; Rao & Verma in Bull. bot. Surv. India 18(1-4): 5. f. 8. 1976 (Plate 11).

Vern.-' Dum ' (K).

Perennial herbs. Stems compressed, leafy, sometimes rooting at the nodes. Leaves shorter than the stems, acute, glabrous. Flowers bisexual, in compound or decompound heads;

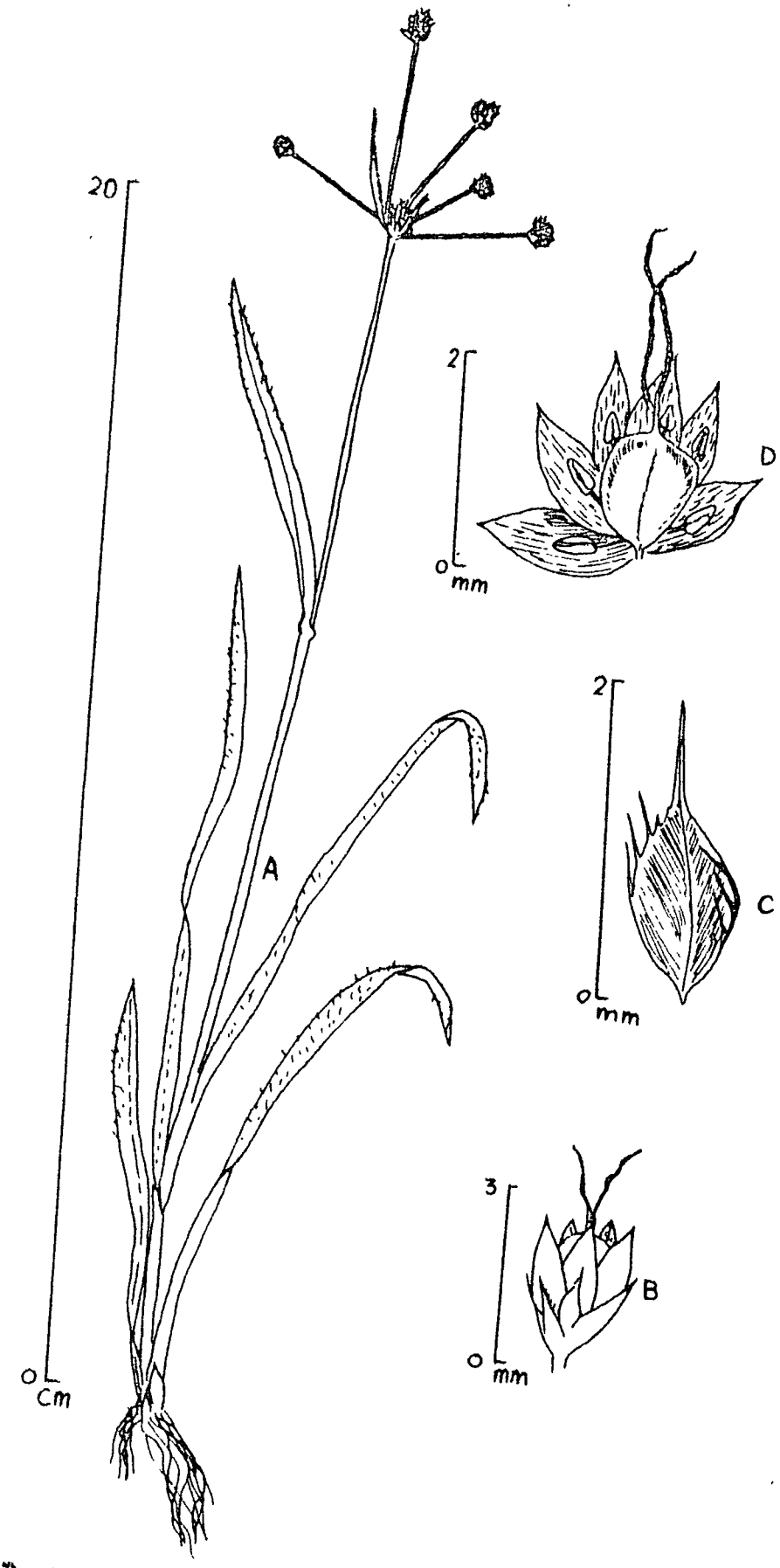


Plate 12 Luzula compestris D.C., A.Habit, B.Flower, C.Sepal, D.Flower (top view).

bracts leafy, much shorter than the inflorescence. Perianth 6, 5 mm, outer 3 smaller, acute, with distinct median nerves, inner 3 broader than the outer ones, equal in length; stamens 3, adnate to the base of the inner perianth segments, much shorter than the perianth segments; carpels 3, styles united, ending in 3-plumose, coiled stigmas; ovary 3-celled. Capsules longer than the perianth segments, slightly compressed. Seeds minute, arriculate, testa reticulate.

Common in paddy fields, marshes, water channels, ditches, etc. and often forms a nuisance in paddy fields.

Fls. & Frts. : All the major parts of the year.

Specimens examined: Lyrthong 1010; 1384 Nongpoh (Khasi Hills); 1588 Jowai (Jaintia Hills); 3107 Baghmara (Garo Hills).

Luzula DC.

Luzula campestris DC. Fl. Franc. 3: 161. 1815; Hook.f. Fl. Brit. India 6: 401. 1892 (Plate 12).

Terrestrial herbs. Stems 15-30 cm high, hairy. Leaves tufted, ciliate, 10-15 x 0.5-0.8 cm, obtuse. Flowers in dense subumbellate panicles or cymes. Perianth 6, in 2-series, outer 3, 2 mm long; inner segments equaling the outer ones; stamens 6, adnate to the base of each segment; anthers sagittate; carpels 3, styles united, as long as, or longer than the nut. Capsules 3-celled. Seeds often with fleshy appendage.

Common both in open and shady areas.

Fls. & Frts. : February to August.

Specimens examined: Lyrthong 1531 Shillong.

CYPERALES

Cyperaceae

A. L. de Juss. Gen. Pl. 26. 1789.

Grass or rush-like, annual or perennial herbs. Culms tufted, triangular, solid. Leaves grass-like, rarely absent, 3-ranked, mostly crowded at the base of the stems. Sheaths close; ligule absent or sometimes present as a short prolongation of the mouth of the sheaths, opposite the blade. Flowers bisexual or unisexual in the axils of glumes. Perianth absent or of 2 or more hypogynous bristles; stamens 1-3, rarely more; anthers linear, basifixed; filaments flat; ovary 1-celled; styles short or long, slender; stigmas 2-3. Nuts trigonous. Seeds erect, free; embryo minute, albumen floury.

K E Y T O G E N E R A

1a. Hypogynous bristles or scales present.
  2a. Leaves 0.
    3a. Spikelets 1-9, together in a single lateral head. . . . . Schoenoplectus
    3b. Spikelets solitary, terminal . . . Eleocharis
  2b. Leaves present.
    4a. Bristles filiform, as long as or much longer than the nut. Stamen Ch.?
      5a. Hypogynous bristles undivided, linear, rarely oblong, elongated in fruit. . . . . Scirpus
      5b. Hypogynous bristles divided, not elongated in fruits. . . . Rhynchospora
    4b. Bristles broad, glumaceous, oblong.

6a. Spikelets many, on the upper portion of the culms, elliptic, green, developed at the axils of leafy bracts . . . . . Fuirena

6b. Spikelets 3-5 together, globose, white, terminating the culms. . . . . Lipocarpha

1b. Hypogynous bristles or scales 0.

7a. Achenes enclosed within a bottle-like utricles . . . . . Carex

7b. Achenes not enclosed in utricles.

8a. Spikelets many flowered, elliptic or globose, distinctly keeled.

9a. Styles flat; style base persistent or if deciduous not leaving a tumour on the nut. . . Fimbristylis

9b. Styles linear, filiform; style base deciduous leaving a tumour on the nut . . . . . Bulbostylis

8b. Spikelets 1-flowered, if many flowered, cylindric, not keeled.

10a. Spikes corumbose; spikelets with a single terminal female flower and 2 basal males and 0-9 monandrous or empty glumes all spirally arranged. . . . . Hypolytrum

10b. Spikes otherwise; spikelets with many terminal male flowers and few females at the base or unisexual.

11a. Spikelets unisexual, solitary; nuts bony . . . . . Scleria

11b. Spikelets bisexual, numerous; nuts not bony.

12a. Rhachilla of spikelets not articulating, persistent, and only glumes deciduous from rhachilla.

13a. Achenes trigonous or dorsi-ventrally flattened with 1-side facing rhachilla . . . . . Cyperus

13b. Achenes laterally compressed or flattened with one angle facing rhachilla . . . . . Pycreus

12b. Rhachilla articulate, whole spikelets falling off.

14a. Achenes winged . . . . . Courtoisia

14b. Achenes not winged.

15a. Spikes cylindric on long rays, usually green or brown . . . Mariscus

15b. Spikes globose or sub-globose, sessile at the apex of leafy stems . . . Kyllinga

Bulbostylis Kunth

Annuals. Culms slender, capillary. Leaves capillary, hairy or glabrous. Spikelets umbellate or reduced to a single spikelet. Spikelets many flowered, cylindric or cuneate, keeled. Glumes imbricate, spirally arranged on the rhachilla; stamens 1-3; anthers 2-celled, not crested. Styles slender; style base not dilated and deciduous leaving a peculiar button-like, at the apex of the nut; stigmas 3-fid. Nut trigonous.

K E Y T O S P E C I E S

1a. Spikelets few or solitary . . . . . densa

1b. Spikelets congested in globose heads . . barbata

Bulbostylis barbata (Rottb.) Cl. in Hook.f. Fl. Brit. India 6: 651. 1893; Koyama in Hara Fl. East. Himal. 380. 1966; Babu Forb. Fl. Dehra Dun 549. 1977. - - Scirpus barbatus Rottb. Descr. Pl. Rar. Progr. 27. 1772.

Tufted herbs. Roots fibrous, capillary. Stems 5-15 cm high, subterete, glabrous. Leaves capillary, as long as or shorter than the stems, glabrous. Bracts 2-3, leaf-like, as long as the globose heads. Spikelets many, condensed into subglobose heads, 4-6 mm long. Glumes 1 mm long, ovate, 3-nerved, shortly mucronate, glabrous; stamens 2; filaments very short; anthers flaccid, less than half a millimeter; styles 3-fid. Nuts ovate or oblong, trigonous, truncate with persistent style base, shortly stipitate, 3 mm long.

Common in damp places, along the banks of rivers, streams etc.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 2912 Agarobadha (Garo Hills).

Bulbostylis densa (Wall. ex Roxb.) Hand.-Mazz. ex Karsten in Schenk Veg. 20(7): 16. 1930; Koyama in Hara Fl. East. Himal. 380. 1966. - - Scirpus densus Wall. ex Roxb. Fl. Ind. 1: 231. 1820. - - Bulbostylis capillaris (Linn.) Cl. in Hook.f. Fl. Brit. India 6: 652. 1893 (Plate 13).

Culms tufted, 3-15 cm high, trigonous. Leaves glabrous, as long as or shorter than culms, obtuse. Spikelets few, elliptic, acute. Glumes dark brown, ovate obtuse, 2-2.5 mm long; stamens 1-2; filaments very short; anthers cylindric, yellow;

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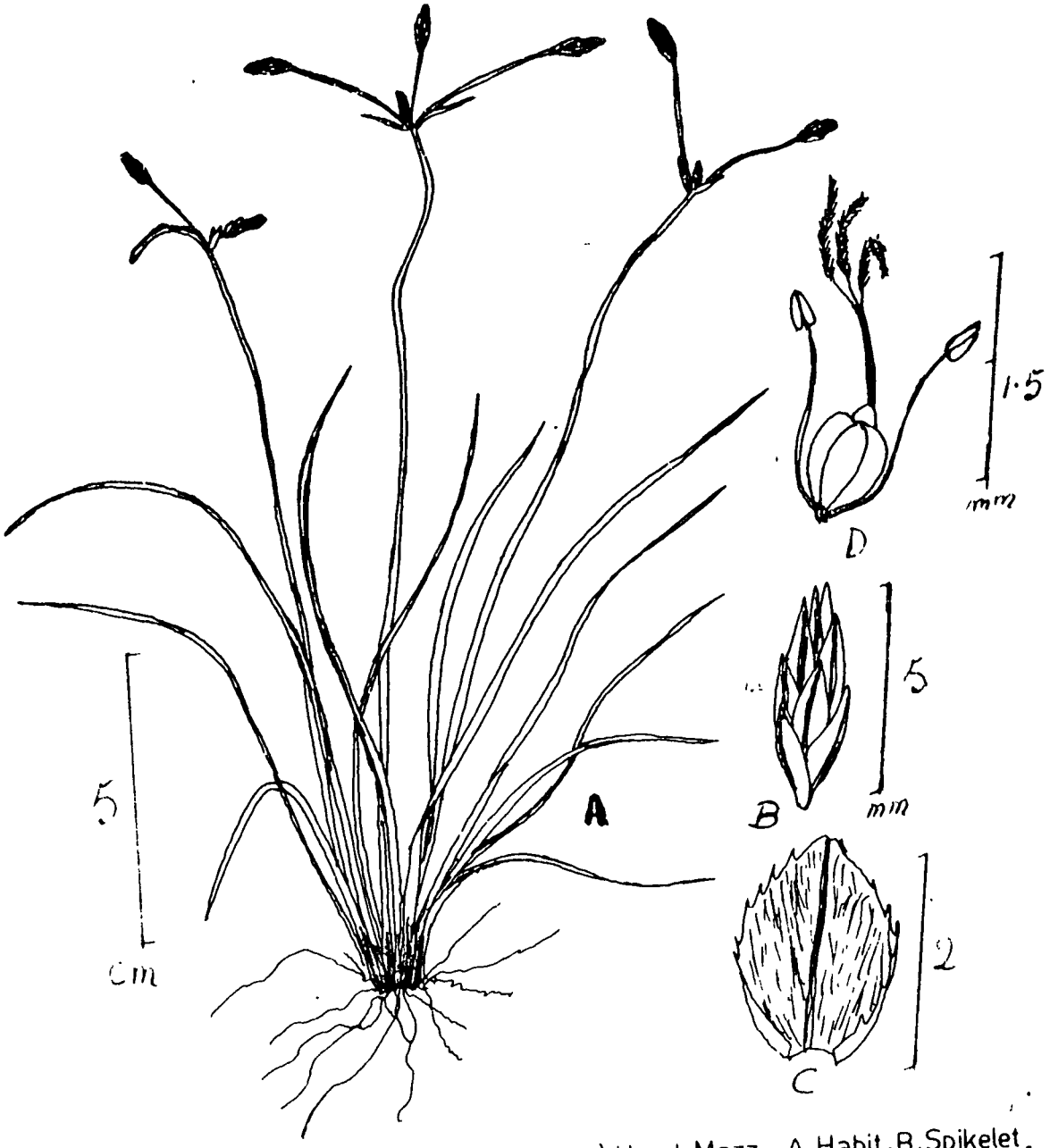

Plate 13 Bulbostylis densa (Wall. ex Roxb.) Hand. Mazz. A. Habit, B. Spikelet, C. Glume, D. Gynoecium with Androecium.

styles filiform, glabrous, 3-fid, granulated. Nut ovoid, truncate 1 mm long, echinate or tuberculate.

Common in grasslnds, and in pine forests. Also in abandoned cultivated fields, in association with grasses and other herbaceous plants.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1040, 1116 Shillong; 1809 Nongstoin.

Carex Linn.

Perennials; leafy at the base. Culms 30-100 cm high, trigonous, jointed or not with 1 leaf at each node. Spikelets solitary or few, unisexual or androgynous, the lowest females with a few males at the base or top, dioecious; uppermost wholly males. Glumes many, imbricate all round the rhachilla, persistent or deciduous. Flowers solitary in each glume. Male flowers of 2-3 stamens; female flowers enclosed in a bottle shaped, 2-fid utricles; styles slender, 2-3-fid, exserted. Nut trigonous or planoconvex, polished or not.

K E Y T O S P E C I E S

1a. Styles 2-fid.
  2a. Terminal spikes only with female flowers or few males at base and apex.
    3a. Terminal spikes with females at base and males at top.
      4a. Spikes ovoid, or oblong.

5a. Spikes stout, leafy bracts much overtopping the spikes so that the latter remain concealed . . . . . thomsonii

5b. Spikes slender, leafy bracts not overtopping the spikes . . . . . nubigena

4b. Spikes linear-cylindric.

6a. Spikes with long filiform peduncles . . longipes

6b. Spikes sessile or with short peduncles . . . . . teinogyna

3b. Terminal spikes males at base and females at top.

7a. Spikes short, ovoid or oblong, not tailed.

8a. Stems and leaves filiform; beaks of utricles not winged . . . . . remota

8b. Stems and leaves otherwise; beaks of utricles strongly winged . . . alata

7b. Spikes linear-cylindric with or without tails. . . . . Praelonga

2b. Terminal spikes wholly males.

9a. Spikes cylindric, green, not comose . . . phacota

9b. Spikes linear, brown, comose with stigmatic branches all over . . . . . rubro-brunnea

1b. Styles 3-fid.

10a. Spikelets condensed into cylindric spikes.

11a. Culms with solitary, terminal spikes . . . rara

11b. Culms with many spikes.

12a. Nuts pointed at both ends.

13a. Female glumes striate throughout their length; utricles ovoid, trigonous, not winged . . . . . baccans

13b. Female glumes striate in the lower portion only; utricles otherwise, winged at the apex . . . . . myosurus

12b. Nuts pointed at the apex only.

14a. Spikes numerous, brown.
15a. Utricles winged at margin, lanceolate upwards, many-nerved . . . . . spiculata
15b. Utricles not winged at the margin, ovate, nerveless . . . . . compositа
14b. Spikes few, green.
16a. Spikes both on radical and axillary peduncles . . . . . speciosa
16b. Radical peduncles 0.
17a. Plants very small, up to 15 cm high or rarely up to 20 cm high; spikes ovoid, 1-2 cm long. . . . . breviculmis
17b. Plants robust, more than 20 cm high; spikes cylindric, more than 2 cm long. . . . . japonica
10b. Spikelets solitary or loosely packed in spikes.
18a. Panicles erect or suberect.
19a. Sub-basal leaves long, narrow; immature spikes with long bracteoles; glumes awned; utricles sub-globose . . indica
19b. Radical leaves short, broad; immature spikes without bracteoles; glumes not awned; utricles globose. . . . stramentitia
18b. Panicles spreading.
20a. Branchlets stout,
21a. Utricles regularly ribbed; panicles green or straw-coloured. . cruciata
21b. Utricles irregularly ribbed; panicles ferruginous. . . . . vesiculosa
20b. Branchlets filiform.
22a. Utricles as long as beaks . . . . filicina
22b. Utricles shorter than the the long beaks . . . . . filicina var. minor

Carex alata Boott. in Proc. Linn. Soc. 1: 254. 1845; et in Carex 1: 59. t. 155. 1858; Cl. in Hook.f. Fl. Brit. India 6: 707. 1894.

Rhizomes short or long. Culms 60-70 cm high, trigonous, glabrous. Leaves as long as or shorter than the culms, glabrous, bluntly serrate towards the apex. Bracts leaf-like, lowest one very long, longer than the inflorescence. Spikes sessile, 1-0.6 cm. Glumes 2 mm long, triangular, acute, hyaline, transparent, except the green middle keel. Utricles 2 mm long, plano-convex, 3-5-nerved on both faces, shoulder of the beak serrate, beak flat, 2-fid. Nuts ellipsoid, ovoid, smooth, stipitate, with a stout persistent style base. Styles as long as the nut, 2-fid.

Rare; occurs in ditches in association with grasses.

Flo. & Frts. : August to November.

Specimens examined: Kyrthong 2946 Upper Shillong.

Carex baccans Nees in Wight Contrib. Bot. Ind. 122. 1834; Cl. in Hook.f. Fl. Brit. India 6: 722. 1894; Koyama in Hara, Fl. East. Himal. 380. 1966.

Vern.-'Jasier ' (K).

Rhizomes short, stout, covered with dry scales. Culms erect, 50-100 cm high. Leaves overtopping the culms, 5-8 mm broad, margin scabrid. Bracts leaf-like. Panicles elongate, 20-30 cm long; spikelets 3 mm long, compactly arranged on cylindric spikes, tailed. Glumes 3 mm long. Male flowers at the apex of the spikes, glumes oblong, caudate; filaments short; anthers

2 mm long, yellow; utricles trigonous with short beak, glabrous, with many stout nerves within; styles 3-fid, branches brown, coiled. Nuts trigonous.

Common in shady areas and along the banks of streams, rivers, etc., in association with other herbaceous plants and grasses.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1167 Shillong, 3284 Mylliem (Khasi Hills); 3231 Sutnga (Jaintia Hills).

Carex breviculmis R. Br. Prodr. 242. 1810; Cl. in Hook.f. Fl. Brit. India 6: 746. 1894; Ohwi in Hara Fl. East. Himal. 2 rep. 146. 1971.

Rhizomes creeping with pale brown scales. Culms tufted, trigonous, 15-20 cm high. Leaves shorter than the culms, glabrous, 3-nerved, obtuse. Bracts leaf-like, longer than the spikes. Spikes terminal, 2-4-flowered. Male glumes 5 mm long, ovate-lanceolate, narrower than the females; filaments 1.5 mm long; anthers 3 mm long, cylindric, apex rounded; female glumes 4 mm long, cuspidate, longer than the utricles, margin hyaline. Utricles scabrid, trigonous, shorter than the hispid glumes. Nuts glabrous, trigonous. Styles 3-fid, with ciliated base.

Common in open and partially shaded areas in forests.

Fls. & Frts. : March to October.

Specimens examined: Myrthong 1513 Shillong.

Plate 14 Carex composita Boott. A. Habit, B. Female flower, C. Non-flowering Glume, D. Flowering Glume (Ventral view), E. Utricle, F. Nut with style.

Carex composita Boott. Ill. 1: 3, t. 8. 1858; Cl. in Hook. f. Fl. Brit. India 6: 724. 1894; Raju in Rec. bot. Surv. India 20(2): 231. 1973(Plate 14).

Vern.-' Jasier ' (K).

Rhizomes creeping, woody, covered with brown or straw coloured fibrous sheaths. Culms 40-70 cm high, trigonous, glabrous. Leaves as long as or longer than the culms, 2-5 cm broad, convolute when dry, glabrous, margin scabrid, apex filiform. Bracts leaf-like, lowest one longer than the spikes. Panicles 15-30 cm long, spikes 10-20, 2-8 cm long, cylindric and tailed at the apex. Male glumes 4 mm long, lanceolate, acute, 1-nerved, margin brown; stamens 3, filaments about 0.5 mm long; anthers stout, up to 2 mm long, cylindric, apex penicellate; female glumes 2-4 mm long, ovate-lanceolate, distinctly 1-nerved, keels brown, margin hyaline; apex cuspidate, overtopping the utricles. Utricles ovate, acute at both ends, stipitate, densely hairy, specially towards the upper portion, nerveless, convex, 2-2.5 mm long, beak cylindric, 2-fid; styles 3-fid, branches stout, hairy.

Common on banks of rivers, streams etc.

Fls. & Frts. : October to January.

Specimens examined: Nyrthong 1048 Shillong, 1105 Upper Shillong.

Plate 15 Carex cruciata Vahl. A. Habit B. Spikelet, C. Glume, D. Utricle, E. Nut carpels.

Kongh.

Carex cruciata Wahl. in Vent. Acad. Handl. Stock. 24: 149. 1803; Cl. in Hook.f. Fl. Brit. India 6: 715. 1894; Koyama in Hara Fl. East. Himal. 381. 1966; Raju in Rec. bot. Surv. India 20(2): 231. 1973; Babu, Herb. Fl. Dehra Dun 550. 1977 (Plate 15).

Vern. - ' Jasier ' (K).

Rhizomes woody, horizontal, stout. Culms 60-100 cm high. Leaves shorter than the culms, crowded, obtuse, channelled. Panicles pyramidal, spikelets trigonous, 3-4 mm long. Glumes as long as the spikelets, faintly 4-nerved, tapering from the middle towards the apex, margin scabrid. Anthers yellow, elongate, 2-celled; utricles strongly ribbed and contracted, suddenly narrowed into a beak; styles 3-fid, coiled. Nuts trigonous.

Common in open and shady areas, in association with grasses and other herbaceous plants.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1025, 1170 Shillong; 1212 Cherrapunjee.

See p. 111

Carex filicina Nees in Wight Contrib. 123. 1834; Cl. in Hook.f. Fl. Brit. India 6: 717. 1894; Koyama in Hara, Fl. East. Himal. 381. 1966.

Vern.-'Jasier ' (K).

Rhizomes woody, short, stout, covered with pale brown scales . Culms 40-60 cm high, trigonous, glabrous. Leaves as long as the culms, glabrous, acute, margin scabrid. Panicles pyramidal. Spikelets lax, borne on slender branches. Female glumes 1.5-2 mm long, 1-nerved, apex rounded or subacute. Utricles as long as glumes excepting the long pointed beak, minutely hairy or

granulate, few nerved, beak curved or oblique, 2-fid; styles 3-fid, branches scabrous. Nuts trigonous, ovate.

Common along the banks of rivers, streams, etc., in association with grasses and other herbaceous plants.

Fls. & Frts.: Junuary to October.

Specimens examined: Myrthong 1502, 1515 Shillong; 1789 Pariong (West Khasi Hills); 1873 Mawmluh (East Khasi Hills).

var. minor Boott. Carex 3: 106. t. 317 & 318. 1862.

This variety differs from the type species in having smaller and much narrower leaves and female glumes with more pointed apex, spikelets sparser and branches filiform and weak. Utricles with longer beaks.

Common in forests in dry areas and also in grasslands, in association with ferns.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1853 Mylliem (Khasi Hills);

Carex indica Linn. Mant. Alt. 574. 1771; Cl. in Hook.f. Fl. Brit. India 6: 714. 1894.

Vern.-' Jasier-khlaw ' (K.).

Rhizomes woody, with brown fine scales, sometimes with hair-like scales. Culms 30-90 cm high, trigonous. Leaves radical, tufted, longer than the culms 0.5-1.5 cm broad; sheaths faintly purple. Bracts leaf-like, much longer than the panicles. Panicles remote, oblong, white or brown, spikelets 0.5-1 cm long, acute, many flowered. Glumes 4 mm long, cymbiform, 1-nerved, mucronate, keels scabrid. Filaments short; anthers flat; styles 3-fid. Nuts

ellipsoid, trigonous.

Common undergrowth of forests; in association with grasses and other herbaceous plants.

Fls. & Frts. : December to March.

Specimens examined: Myrthong 1366 Lailad; 1500 Shillong.

Carex japonica Thunb. Fl. Jap. 38. 1784; Cl. in Hook.f. Brit. India 6: 736. 1894; Koyama in Hara Fl. East. Himal. 382. 1966.

Rhizomes long, slender with pale shining, fibrous scales. Culms 30-40 cm high, sharply trigonous, angles winged. Leaves as long as or shorter than the culms, 0.5-1 cm broad, glabrous, tapering gradually from the upper half, margin scabrid. Bracts leaf-like, lowest bracts overtopping the inflorescence. Spikes usually 5, lowest one distant at the axil of the lowest bract and the upper ones close, male spike 1, terminal, linear, longer than females; female spikes cylindric, green, 3-6 x 0.5 cm, truncate. Glumes 2-3 mm long, obovate, acute, 1-nerved, granular, keels hyaline, caudate. Anthers broad, 2 mm long, glandulous. Utricle suberect, with pointed beak; 4 mm long; styles 3-fid, branches long, brown, comose. Nuts trigonous, filling up the utricle except the beak.

Common in abandoned cultivated lands; and in grasslands.

Fls. & Frts. : March to October.

Specimens examined: Myrthong 1565 Shillong.

Carex longipes D. Don in Trans. Linn. Soc. 14: 329. 1825; Cl. in Hook.f. Fl. Brit. India 6: 704. 1894; Koyama in Hara Fl. East. Himal. 382. 1966.

Rhizomes short, woody, covered with leafsheaths. Culms 20-40 cm high, slender. Leaves 15-20 x 0.2-0.6 cm, acute, glabrous. Bracts leaf-like, shorter than the panicle. Spikes few, long peduncled, subcylindric. Lowest ones distant, peduncles up to 10 cm long, filiform. Male inflorescence at the apex; glumes 2 mm long, ovate, acuminate, 1-nerved; stamens 3; filaments short; anthers glandulous, about 1 mm long, 2-celled, confluent, with distinct groove, truncate. Female glumes 2-5 mm long, including bristles, ovate, acuminate, mucro produced into a scabrid husp overtopping the utricle. Utricles 3 mm long, flat, beaked. Beaks scabrid on the margin, base pointed or slightly stipitate, nerved. Styles 2-fid. Nuts ovoid or ellipsoid.

Common in forests, specially on dry soils and in fallows.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1568 Shillong; 1659 Burnihat.

See p 108

Carex myosurus Nees in Wight Contrib. Bot. India. 22. 1834; Cl. in Hook.f. Fl. Brit. India 6: 723. 1894; Babu Herb. Fl. Dehra Dun 550. 1977.

Vern.-' Jasier ' (K).

Rhizomes short, stout with brown fibres. Culms up to 1 m high, trigonous, glabrous. Leaves as long as the culms, 0.5-1 cm broad, glabrous, margin scabrid, apex caudate or filiform. Bracts leaf-like, much longer than the inflorescence. Panicles about 30 cm long, with many linear brown spikes. Male spikes at

the apex , forming tail-like structures; male glumes 3-4 mm long, ovate or sub-oblong, apex narrowed, slightly twisted; filaments about 1 mm long; anthers 2 mm long, tapering gradually to the apex; female glumes as long as males and same in texture as males, but broader at the apex, cuspidate, 1-nerved or sometimes 3-nerved, keels brown, margin hyaline. Styles 3-fid, base stout, branches glandulous, tapering towards the apex; utricles as long as the glumes, trigonous, many nerved, narrowed at both ends, beak narrow, short, slightly oblique. Nuts distinctly 3-angled, pointed at both ends, finely glandulous.

Common in forests as well as in scrub-jungles.

Fls. & Frts. : August to December.

Specimens examined: Kyrthong 1153, 3031, 3051 Shillong.

Carex nubigena D. Don in Trans. Linn. Soc. 14: 326. 1825; Cl. in Hook.f. Fl. Brit. India 6: 702. 1894; Koyama in Hara Fl. East. Himal. 383. 1966.

Rhizomes short, tufted. Culms 20-40 cm high, tufted with hairy brown scales at the base, trigonous, ribbed. Leaves longer than the culms, linear, convolute, subacute. Bracts leaf-like, as long as or slightly longer than spikes. Spikes 2-6 cm long, interrupted. Spikelets 4-6 mm long. Male glumes linear, acute, much narrower than the females; stamens 1-3; filaments very short; anthers linear, 1-2 mm long, 2-celled, confluent in young stage, penicellate. Female glumes ovate, acute, 3 mm long, with a prominent median nerve. Utricles 4 mm long, beaked; beak 2-fid, many nerved with scattered red glands inbetween the nerves. Styles 2-fid. Nuts ovoid, clavate, 1-2 mm long.

Common in both open and shrubby areas especially along the banks of the streams, channels, etc., in association with grasses.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1534 Shillong; 1872 Mawmluh.

Carex phacota Spreng. Syst. 3: 826. 1826; Cl. in Hook.f. Fl. Brit. India 6: 708. 1894.

Vern.-' Jasier ' (K).

This appears to be a new record Jaintia!!

Stolons short, stout. Roots thick. Culms tufted, acutely trigonous, 50-120 cm high. Leaves crowded at the base, as long as or shorter than the culms, margin scabrid, many nerved. Bracts leaf-like, overtopping the inflorescence or shorter. Spikes 4-15, cylindric, beaked, 5 cm long. Male spikes much smaller and linear; stamens 1-2; filaments short; anthers cylindric, yellow. Female glumes with excurrent, green scabrid tip, ferruginous; utricle ovoid, with short beak, densely gland-dotted all over the utricle. Styles 2-fid, branches straight. Nut ovoid.

Common in marshes and in water channels.

Fls. & Frts. : February to June.

Specimens examined: Myrthong 1511 Shillong; 1587 Jowai.

Carex praelonga Cl. in Hook.f. Fl. Brit. India 6: 707. 1894.

Rhizomes prostrate, brown scaly. Roots stout. Culms tufted, 3-40 cm high, trigonous. Leaves as long as or much shorter than the culms, glabrous, with shining sheaths. Bracts

leaf-like, lowest overtopping the spikes. Spikes 4-5, cylindric, linear, brown. Male spikes at the top. Female glumes as long as the utricle, 3-nerved above and 1-nerved below, green on the back with brown glands, keels scabrous, apex acuminate, excurrent. Utricle ovoid, trigonous yellow brown, with glands all over the surface, beak linear, shortly notched; styles 2-fid, rough, gradually tapering to the apex. Nut ovoid.

Common in marshes, along the banks of streams, edges of ponds, tanks etc., in association with grasses.

Fls. & Frts. : March to November.

Specimens examined: Myrthong 1498 Shillong.

Carex rara Boott in Proc. Linn. Soc. 1: 284. 1845 et in Carex 1: t. 109. 1858; Cl. in Hook.f. Fl. Brit. India 6: 713. 1894; Koyama in Hara Fl. East. Himal. 384. 1966.

Rhizomes short, decumbent, culms tufted, 20-30 cm high, capillary, subterete, striate, glabrous. Leaves few, as long as the culms or longer, scabrid on the margins, 1-nerved. Bracts leaf-like, very short, 3 mm long, scabrid. Spikes solitary, terminal, 1-2 cm long, just broader than the capillary culms, green or pale brown, pointed. Glumes 2 mm long, oblong, rounded, 3-nerved; stamens 1-3; anthers 2 mm long, cylindric, dorsifixed, with tuft of capillary hairs at the apex. Utricles 1.5 mm long; styles 3-fid, branches recurved, hairy. Nuts ovoid, filling up the utricle.

Rare; along road cuttings on hills.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1499 Shillong.

Carex remota Linn. Sp. 1383. 1753; Cl. in Hook.f. Fl. Brit. India 6: 706. 1894.

Culms tufted, weak, prostrate or hanging, 50-70 cm high, trigonous. Leaves as long as or shorter than culms, very weak, 3 mm broad. Bracts leaf-like, longer than the inflorescence. Lowest spike distant. Spikes 1-1.5 cm long, clavate or lanceolate, green. Glumes 2-2.5 mm long, hyaline, ovate, triangular, median nerve green. Utricles 2-3 mm long, glabrous, scabrid on the shoulder of the beak, beak flat, 2-fid; styles as long as the nut, 2-fid. Nuts oblong, narrowed at the upper portion, smooth or obscurely transversely cancellate.

Rare; in shrubby areas in association with grasses. Very closely resembles to C. alata Boott. but differs in having smaller and weaker culms and leaves, larger utricle which are glabrous, and oblong nuts.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3257 Laitlyngkot (Khasi Hills).

Carex rubro-brunnea Cl. in Hook.f. Fl. Brit. India 6: 710. 1894; Ohwi in Hara Fl. East. Himal. 2 rep. 148. 1971.

Rhizomes woody with pale brown scales. Roots tufted. Culms tufted, 10-30 cm high, trigonous. Leaves crowded at the base, linear, much overtopping, acute, 3-5 mm broad, with prominent midrib, margin scabrid. Bracts leaf-like, overtopping the

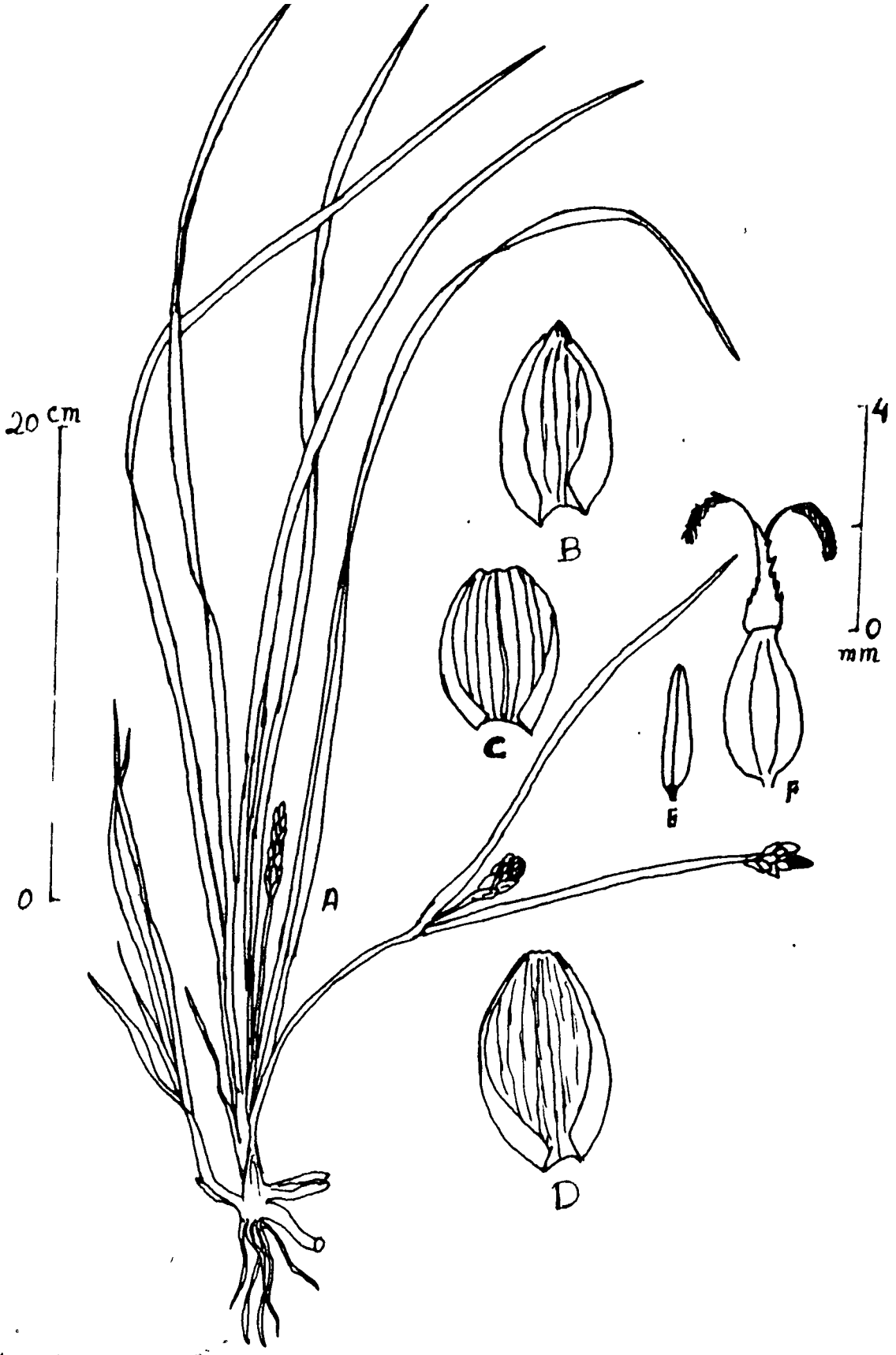

Plate 16 Carex speciosa Kunth. A. Habit, B. & C. Glumes, D. Utricle, E. Stamen, F. Nut with persistent style.

spikes, acute. Spikes 4, together, [illegible] 6-20 x 0.1-0.2 cm. Male glumes linear, acute; stamens 3, short; filaments short; anthers 1 mm long, longer than filament. Female glumes linear, oblique, 2-2.5 long with 1 median nerve, keel yellow, acute, narrow. Utricles 2 mm long, nerveless, glandular; styles 2-fid, branches very long, coarse. Nuts as long as utricles, ovate-lanceolate, pointed at both ends, wrinkled or minutely tuberculate.

Common along the banks of streams and rivers.

Fls. & Frts. : March to November.

Specimens examined: Myrthong 1501 Shillong.

Carex speciosa Kunth Enum. 2: 504. 1837; Cl. in Hook.f. Fl. Brit. India 6. 729. 1894(Plate 16).

Rhizomes woody. Culms 5-30 cm high, slender, trigonous. Leaves as long as or longer than the culms, 6 mm broad, scabrid on the nerves and margin, acute. Bracts leaf-like, shorter than the spikes. Spikes 0.5-2.5 cm long, few flowered, usually on radical peduncles. Male inflorescence terminal or at the base of females; stamens 1-2; filaments fleshy, short; anthers white, longer than filaments. Female glumes 2-4 mm long, 3-nerved, scabrid, green, glabrous, ovate, mucronate; mucro long or short. Utricles trigonous, equally pointed at both ends, sparsely hairy, 5 mm long, distinctly nerved; styles 3-fid, swollen at base. Nuts trigonous, 2 mm long, ovate-lanceolate with dirty brown glands.

Common in pine forests and in shrubby areas in association with grasses and other herbaceous plants.

Fls. & Frts. : January to August.

Specimens examined: Myrthong 1503 Shillong; 1640 Jowai.

Carex spiculata Boott in Proc. Linn. Soc. 1: 288. 1845; Cl. in Hook.f. Fl. Brit. India 6: 724. 1894.

Vern.-' Jasier ' (K).

Rhizomes stout with brown dry scales. Culms 50-80 cm high, trigonous, glabrous. Leaves longer than the culms, 4-5 mm broad, many nerved, margin scabrid. Bracts leaf-like, longer than the inflorescence. Inflorescence 10-15 cm long, with 6-10 spikes. Spikes usually sessile, 2-6 cm long, cylindric, tailed at the apex, straight. Male glumes narrower than female glumes; filaments 2 mm long; anthers 2-2.5 mm long, penicellate. Female glumes 3-4 mm long, lanceolate, green with light brown margin, strongly 1-nerved; apex with scabrid cusp. Utricles 2-4 mm long, distinctly nerved, stipitate, beaked; beak distinctly 2-fid, scabrid. Styles 3-fid, coiled. Nuts ellipsoid, trigonous, stipitate.

Common in forests, along the banks of the streams, edges of rocks, etc.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1210 Mawmluh (East Khasi Hills); Pariong (West Khasi Hills); 1446 Way to Tura Peak (Garo Hills).

Carex stramentitia Boott ex Boeck.in Linneae 40: 351. 1876; Cl. in Hook.f. Fl. Brit. India 6: 717. 1894; Koyama in Hara Fl. East. Himal. 384. 1966; Babu Herb. Fl. Dehra Dun 550. 1977.

Vern.-' Jasier ' (K).

Rhizomes stout, woody, covered with pale brown sheaths. Culms 35-50 cm high, usually hidden inbetween the tufted leaves. Leaves twice the length of the culms, 1-1.5 cm broad, scabrid on the nerves and margin, acute, usually pale green. Bracts leaf-like, much longer than the panicles. Panicles 10-20 cm long, pale white or yellowish white, dense. Spikes up to 1 cm long, densely flowered, acute. Male glumes same in texture as the females but shorter, without a mucro; stamens 3; filaments short; anthers about 1 mm long, apex flat, ciliated. Female glumes 2-4 mm long, 1-nerved, ovate, acuminate; utricles as long as or longer than the glumes, glabrous, beaked, 2-fid; styles 3-fid. Nuts inflated.

Common undergrowth of forests in association with other ground flora.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1366 Lailad East Khasi Hills); 1822 Markasa (West Khasi Hills).

Carex teinogyna Boott Carex 1: 60.t. 158. 1858; Cl. in Hook.f. Fl. Brit. India 6: 705. 1894.

Rhizomes pale brown, covered by needle-like scales. Culms tufted, trigonous, 20-50 cm high. Leaves tufted, shorter than

the culms, 1-2 mm broad, margin scabrid. Bracts leaf-like, longer than the spikes. Spikes lax, spikelets linear. Glumes 5 mm long, acute. Utricles as long as the glumes with long beak, striate, distinctly many nerved, narrowed into a long beak, scabrid on the keels. Styles 2-fid, branches conose; style base subconic. Nuts 2 mm long, ovoid or ellipsoid, pale yellow, slightly compressed.

Common along the banks of streams, channels, etc.,in association with grasses.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1017 Shillong, 1104 Mylliem.

Carex thomsonii Boott/ Carex 1: 1, t. 1. 1858; Cl. in Hook. f. Fl. Brit. India 6: 703. 1894;

Rhizomes stout, woody, swollen into bulb at the base, covered with brown fibrous scales. Culms tufted, forming a stout rootstock in dry season, 20-40 cm high, glabrous usually clothed with leaf sheaths and remains hidden in tuft of leaves. Leaves as long as culms, 4 mm broad, convolute, when dry, acicular, scabrid on the margins. Bracts leaf-like, twice the length of the spikes. Inflorescence an interrupted spike; spikelets 0.5-1 cm long, densely packed or congested, sessile. Glumes sub-deltoid, 1-nerved, lateral nerves obscure. Stamens 3, filaments exserted; anthers yellow, 2-celled. Utricles 2 mm long, glabrous (excepting the margin or keels) 7-9-nerved, glandular, distinctly keeled, scabrid on the keel, beak notched. Styles 2-fid, branches reflexed. Nuts ovoid, lanceolate, 1 mm long.

Common in grasslands and shrubby areas. ???

Fls. & Frts. : May to December.

Specimens examined: Myrthong 3105 Garumpani (Jaintia Hills)

Carex vesiculosa Boott Carex 3: 107, t. 323. 1862; Cl. in Hook.f. Fl. Brit. India 6: 717. 1894.

Vern.:- Jasier ' (K).

Rhizomes with brown scales or sheaths. Culms 40-60 cm high, tufted. Leaves longer than the culms, 3-6 mm broad, margin scabrid, apex filifrom. Bracts leaf-like, much longer than the panicles. Panicles exserting out from the axil of bracts. Spikelets 5-8 mm long, many flowered, acute. Male glumes 4 mm long, faintly transparent, with distinct median nerve; stamens 3; filaments 0.5 mm long; anthers stout, longer than the filaments, 2-celled, obtuse; female glumes ovate, lanceolate, acute or subacute, as long as the males, striate, obscurely nerved. Utricles as long as glumes, beaked; styles 2-fid, base stout, branches thickened with many long hairs.

Common on rocks along the banks of streams, in shady and open places, in association with grasses and other herbaceous plants.

Fls. & Frts. : January to November.

Specimens examined : Myrthong 1114 Upper Shillong; 1247 Mawsmai (Khasi Hills).

Plate 17 Courtoisia cyperoides Nees A. Habit, B. Spikelet C & D. Empty Glumes, E. F. G. H. Flowering Glumes, I. Pistil with Androecium.

Courtoisia Nees

Courtoisia cyperoides (Roxb.) Nees in Linnaea 9: 286. 1834; Cl. in Hook.f. Fl. Brit. India 6: 625. 1893. - - Kyllinga cyperoides Roxb. Fl. Indi 1: 187. 1820 (Plate 17).

Roots fibrous. Culms tufted or subsolitary, trigonous with dry scales or leaf sheaths at the base, 20-60 cm high, shining. Leaves as long as the culms, acute. Bracts leaf-like, acute. Bracteoles 2-3 cm long. Umbels 6-10 x 10-15 cm. Spikelets about 3.5 mm long, flat. Glumes as long as the spikelets, cymbiform, acute, strongly 1-nerved, upper glumes 2 mm long, 3-lobed, the midlobe ending in a tail-like structure, strongly 1-nerved, apex oblique, 2-lobed. Utricles lanceolate, 3.5 mm long, broad, membranous, beaked; stamens 3, filaments filiform; anthers yellow, linear-lanceolate, shorter than the filaments, basifixed; styles 3-fid, short, stout. Nuts elliptic, punctate, acute, yellow brown when mature, completely concealed in the utricle.

Common weed of paddy fields, specially in sandy soil.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1419 Nongpoh.

Cyperus Linn.

Perennial or rarely annual herbs with or without rhizome. Leaves mostly radical. Bracts leaf-like. Inflorescence umbellate or capitate. Spikelets linear, compressed. Rhachilla persistent, not disarticulating at the base, winged or not. Flowers bisexual, arranged distichously on the rhachis. Hypogynous bristles or

scales 0. Stamens 3, rarely 2. Styles 3-fid, rarely 2-fid. Fruit a trigonous nut or dorsiventrally flattened with one side facing the rhachilla.

K E Y T O S P E C I E S

1a. Spikelets spicately disposed on conspicuously elongated rhachis.
  2a. Rhachilla of spikelets winged.
    3a. Plants with creeping stolons or rhizomes.
      4a. Spikelets numerous, more than 30; spikes cylindric, long.
        5a. Wings of rhachilla deciduous . . digitatus
        5b. Wings of rhachilla persistent. . exaltatus
      4b. Spikelets few, usually less than 20, occasionally up to 30; spikes broadly ellipsoid or ovoid.
        6a. Culms 10-30 cm high; bracts as long as or shorter than inflorescence; spikes brown or ferruginous brown. . . . . rotundus
        6b. Culms more than 30 cm high; bracts 2-3 times longer than inflorescence; spikes green or reddish brown in the glumes . . . . . tuberosus
    3b. Plants without creeping rhizomes or stolons.
      7a. Spikelets linear to lanceolate, 1.5-2 mm wide; weakly flattened with two acute edges; glumes close together, acute at apex.
        8a. Glumes 3-3.5 mm long, straw coloured and tinged with reddish brown or brown; nuts trigonous, oblong, ovoid , truncate . . . . . tenuiculmis

8b. Glumes less than 3 mm long, green; nuts triquetrous, truncate . . . zollingeri

7b. Spikelets filiform, subterete, less than 1 mm wide; glumes loose, obtuse.

9a. Spikelets spreading; glumes rounded, obtuse at apex with moderately narrow, hyaline margin . . . distans

9b. Spikelets erect, glumes shallowly emarginate at the apex with very broadly hyaline margins . . . nutans

2b. Rhachilla of spikelets not winged.

10a. Perennials with stolons or rhizomes; rhachis of spikes densely hispid . . . . . pilosus

10b. Annuals with fibrous roots only; rhachis glabrous.

11a. Spikelets 1-1.5 cm long, 2-3 mm wide; glumes 2-3.5 mm long, acute at apex, tightly disposed, green . . . . . compressus

11b. Spikelets 1-2 cm long, 1-1.5 mm wide; glumes 1-1.5 mm wide or less, obtuse, loosely disposed . . . . iria

1b. Spikelets digitately or capitately disposed, congested forming heads.

12a. Leaves reduced to sheaths; leafy bracts more than 15, ... alternifolia var. flabelliformis

12b. Leaves with elongated blades; leafy bracts less than 15.

13a. Plants of aquatic or marshy habitat.

14a. Spikelets solitary, if otherwise not congested in heads.

15a. Glumes densely imbricate and close together so that achenes not exposed between glumes; rhizomes often conspicuous, rather frequently

elongated . . . . . haspan

15b. Glumes sublaxly imbricate and slightly spaced so that achenes exposed between glumes; rhizomes with fibrous roots only. . . . tenuispica

14b. Spikelets numerous, condensed in a head.

16a. Glumes with recurved awn at the apex . . . . . cuspidatus

16b. Glumes without awns . . . . difformis

13b. Plants terrestrial.

17a. Glumes loosely imbricate, spikelets green or yellowish green; nuts exposed . . . . . diffusus

17b. Glumes closely imbricate; spikelets white or straw coloured; nuts not exposed . . . . . pubisquama

Cyperus alternifolius Linn. Mant. 2: 28. 1771. subsp. flabelliformis (Rottb.) Kukenth. Pflanr. 4(20),101. Heft: 193. 1936; Koyama in Gard. Bull. Sing. 30: 140. 1977. - - C. flabelliformis Rottb. Descr. Pl. Rar. Progr. 22. 1772, et in Descr. Icon. Rar. Nov. Pl. 42,t. 12 f. 2. 1773.

Tall perennial herbs. Culms tufted 1 m or more high, subterete. Leaves reduced to sheaths. Bracts leaf-like, 15-20, or more, radiating, 20-30 x 1-1.5 cm, acuminate, many nerved. Panicles compound, many rayed. Spikelets 3-5 x 2 mm, compressed, ovate-lanceolate, acute, brownish green. Glumes about 2 mm long, ovate, acute, 3-nerved, median nerve less prominent than the lateral ones. Stamens 3; filaments 1 mm long; anthers four times longer than the filaments. Styles shorter than the glumes, 3-fid, branches coiled, as long as the style. Nuts trigonous,

shorter than the glumes.

Cultivated in gardens as ornamental.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1349 Shillong.

Cyperus compressus Linn. Sp. Pl. 40. 1753; Cl. in Hook.f. Fl. Brit. India 6: 605. 1893; Babu Herb. Fl. Dehra Dun 555. 1977; Koyama in Hara Fl. East. Himal. 385. 1966 et in Gard. Bull. Sing. 30: 138. 1977.

Roots fibrous, brown. Culms tufted, erect or spreading, 10-30 cm high, trigonous, glabrous. Leaves as long as or shorter than culms, 1-2 mm broad, margin scabrid. Bracts longer and broader than the leaves, 1-6 rayed. Spikelets sessile, clustered, 0.5-2 cm long, green. Glumes 3 mm long, margin membranous, aristate or with a stout mucro. Stamens 3; anthers longer than the filaments; styles 3-fid, filiform. Nuts 1.5 mm long, distinctly trigonous, broader above , apex rounded.

A weed of roadsides and paddy fields, in dry, sandy areas.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1627 Dawki (Jaintia Hills); 1670 Umling (Khasi Hills); 1921 Agarobadha (Garo Hills).

Cyperus cuspidatus Kunth in Humb. Bonpl. & Kunth Nov. Gen. et Sp. Pl. 1: 204. 1815; Cl. in Hook.f. Fl. Brit. India 6: 598. 1893; Babu Herb. Fl. Dehra Dun 555. 1977; Koyama in Hara Fl. East. Himl. 385. 1966 et in Gard. Bull. Sing. 30:

143. 1977.

Roots fibrous, purplish brown, tufted. Culms 5-20 cm high, tufted, trigonous. Leaves radical, 5-10 x 0.1 cm, setaceous. Bracts leaf-like, rays 3-6; spikelets congested or digitate, straw or pale green, with distinct, green, recurved arista at the apex of the glumes. Spikelets 4-6 x 1 mm; glumes 1 mm long, excluding the arista, keels hyaline, 1-nerved, arista as long as or shorter than the glumes. Bristles strap-shaped. Stamens 1; anthers very short; styles short, 3-fid, unequal. Nuts 5 mm long, ovoid, trigonous.

Common in paddy fields and along roadsides, usually on sandy soils.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1913 Agarobadha (Garo Hills); 3267 Trongpleng (West Khasi Hills).

Cyperus difformis Linn. Cent. Pl. 2: 6. 1756; Cl. in Hook. f. Fl. Brit. India 6: 599. 1893; Babu Herb. Fl. Dehra Dun 556. 1977; Koyama in Hara Fl. East. Himal. 386. 1966 et in Gard. Bull. Sing. 30: 143. 1977.

Rhizomes 0. Roots fibrous, tufted. Culms 15-60 cm high, trigonous. Leaves radical, shorter than the culms, 3-5 mm broad, glabrous, margin minutely scabrid. Bracts leaf-like. Inflorescence globose, spikelets numerous, brown or blackish brown 2-4 mm long, spreading above, apex rounded or slightly notched, margin hyaline. Stamens 2; anthers glandulous; filaments indistinct;

styles 3-fid, stout. Nuts 0.5 mm long, trigonous.

Frequent in marshy places.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1468 Howaghana (Garo Hills); 1919 Agorobadha (Garo Hills).

Cyperus diffusus Vahl. Enum. Pl. 2: 321. 1806; Cl. in Hook.f. Fl. Brit. India 6: 603. 1893; Koyama in Hara Fl. East. Himal. 386. 1966 et in Gard. Bull. Sing. 30: 139. 1977.

Rhizomes short. Roots fibrous, wiry. Culms tufted, 30-50 cm high, trigonous, glabrous, base with brown sheaths. Leaves subradical, as long as or longer than the culms, 0.8-1.2 cm broad, 3-nerved, acute. Bracts leaf-like, 30-40 x 0.8-1 cm, distinctly nerved. Umbels compound, 15-25 cm across, rays long, with short bracteoles. Spikelets linear, lanceolate, 4-6 x 2 mm, 6-12 flowered. Glumes 2 mm long, rounded, mucronate or cuspidate. Keels 3-5, unequally nerved , mottled with brown dots. Stamens 3; filaments short; anthers about 0.5 mm long, cuneate; styles short, about 1 mm long, 3-fid, branches coildd. Nuts trigonous, 2 mm long.

Common, forming undergrowth in forests and shady places.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1447 Way to Tura Peak, 3012 Tasak (Garo Hills); 1723 Burnihat (Khasi Hills).

Cyperus digitatus Roxb. Fl. Ind. 1: 209. 1820; Cl. in Hook.f. Fl. Brit. India 6: 618. 1893; Koyama in Garg. Bull. Sing. 30: 127. 1977.

Roots fibrous, tufted. Culms 60-100 cm high, trigonous, with brown violet sheaths at the base. Leaves as long as the culms, 1.5 cm across, serrate. Bracts leaf-like, 1-2 cm across, serrate. Umbels compound, broad, up to 30 cm across. Spikelets linear, 6 x 1 cm, many flowered, spirally arranged on the rhachilla. Glumes ovate-oblong, 2.5 mm long, margin membranous, mucronate, 2-nerved in the centre. Stamens 3, about 1 mm long; filaments very short; anthers longer than the filaments, yellow; styles filiform, 3-fid. Nuts trigonous, ovoid.

Common in paddy fields and in marshes.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1679 Umling (Khasi Hills).

Cyperus distans Linn.f. Suppl. Pl. 103. 1781; Cl. in Hook. f. Fl. Brit. India 6: 607. 1893; Babu Herb. Fl. Dehra Dun 556. 1977; Koyama in Hara Fl. East. Himal. 386. 1966 et in Gard. Bull. Sing. 30: 135. 1977.

Rhizomes short with purplish scales. Roots fibrous. Culms 40-80 x 0.2-0.4 cm, trigonous, glabrous. Leaves as long as the culms. Bracts leaf-like, longer than the umbels. Spikelets spicate. Glumes remote, 2 mm long, alternately arranged on the zigzag rhachilla, purplish brown, mucronate, margin hyaline, chestnut brown. Stamens 3, filaments about 1 mm long; anthers longer than

the filaments, 2-celled, yellow, basifixed; styles linear, 3-fid, apex incurved. Nuts elliptic, rusty brown or pale brown, trigonous.

Common on sandy soils, along streams, in marshes and along roadsides.

Fls.& Frts. : June to January.

Specimens examined:Myrthong 1621 Pongtung (Khasi Hills); 1639 Jowai.

Cyperus exaltatus Retz. Obs. Bot. 5: 11. 1789; Cl. in ~~H~~ Hook.f. Fl. Brit. India 6: 617. 1893; Kern in Reinwardtia 2: 99, f. 2, 1952; Koyama in Gard. Bull. Sing. 30: 129. 1977.

Tall sedges, reaching 100-120 cm high, glabrous. Culms trigonous. Leaves few, at the base, as long as or shorter than culms, 4-6 mm across, margin scabrid. Bracts leaf-like, much longer than the umbels. Umbels compound; rays 5-10, 10-15 cm long, spreading. Spikelets ascending, narrowly elliptic, chestnut brown or greenish-brown, compressed. Glumes 2-3 mm long, imbricate, mucronate, with green back, obscurely 3-nerved. Stamens 3, filaments about 0.5 mm long; anthers as long as or longer than the filaments;styles 3-fid. Nuts ellipsoid, 0.5 mm long, trigonous, pointed at both ends.

Common along courses of streams; one of the tallest sedges of the state.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 2950 Burnihat (Khasi Hills).

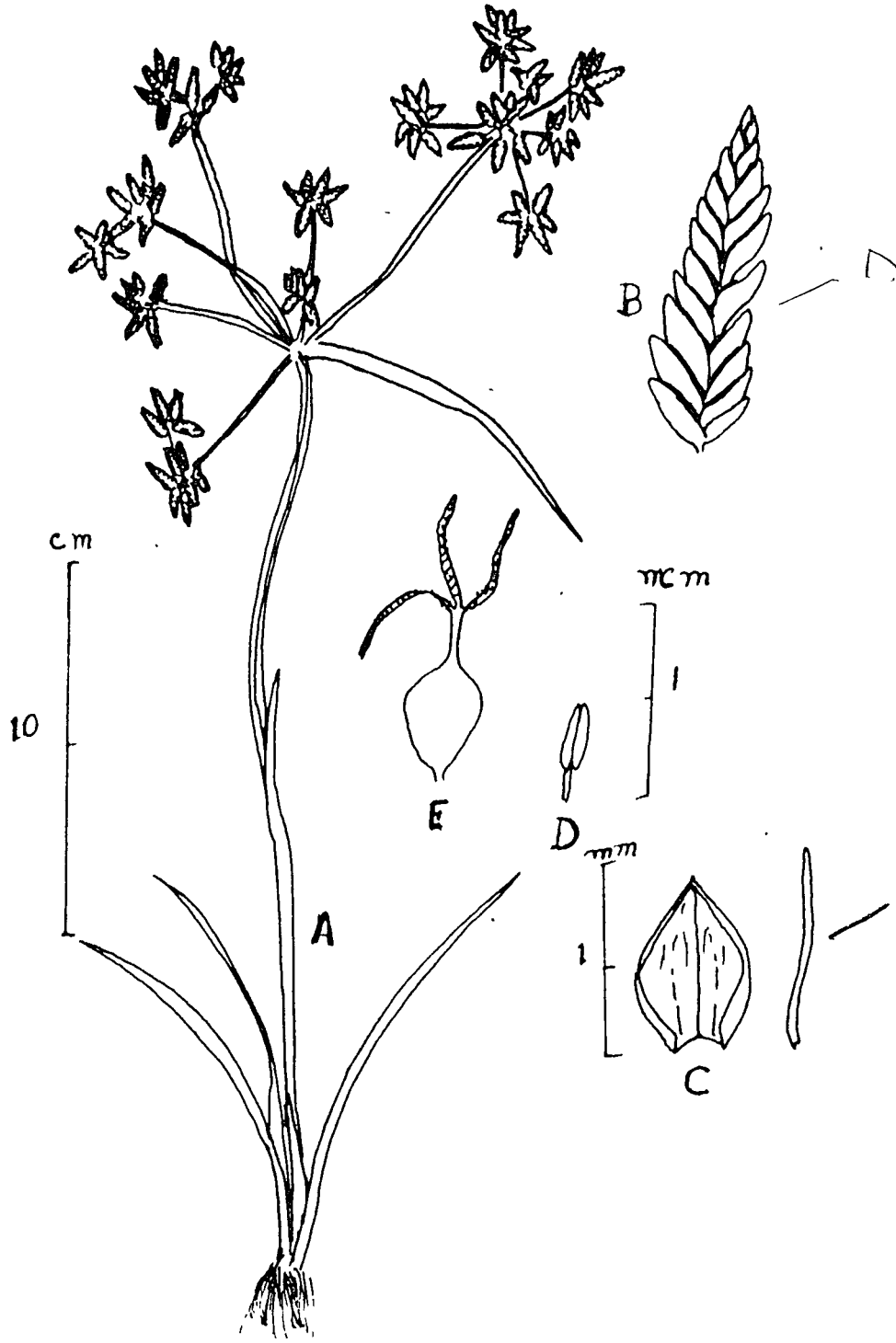

Plate 18 Cyperus haspan Linn., A.Habit, B.Spikelet, C.Glume, D.Stamen, E.Nut with persistent style.

Cyperus haspan Linn. Sp. Pl. 45. 1753p Cl. in Hook.f. Fl. Brit. India 6: 600. 1893; Kern in Reinwardtia 2: 116. 1952; Koyama in Hara Fl. East. Himal. 386. 1966 et in Gard. Bull. Sing. 30: 142. 1977 (Plate 18).

Rhizomes long or short, covered with brown, ovate scales. Culms variable, 15-60 cm high, trigonous. Leaves short, glabrous, obtuse. Umbels compound. Spikelets linear, many-flowered, arranged in 2 rows. Glumes 1-2 mm long, acute, ovate. Stamens 1, erect, about 1 mm long; filaments shorter than anthers; anthers 1 mm long, truncate. Styles 3-fid, linear , curved. Nuts trigonous, pale brown, pointed or beaked.

Common in marshes, in open areas and a weed of paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1096 Barapani (Khasi Hills); 3007 Songsak (Garo Hills); Hynniewta 2131 Shillong.

Cyperus iria Linn. Sp. Pl. 45. 1753; Cl. in Hook.f. Fl. Brit. India 6: 606. 1893; Babu Herb. Fl. Dehra Dun 557. 1977; Koyama in Hara Fl. East. Himal. 387. 1966 et in Gard. Bull. Sing. 30: 139. 1977 (Plate 19).

Culms erect, 30-50 cm high, tufted. Leaves as long as the culms, linear, acute. Sheaths papery. Bracts leaf-like, 3-5, much longer than the umbels. Spikelets lax, brownish yellow, compressed. Glumes 1 mm long, acute, obscurely nerved, ovate, Stamens 2-3; filaments short; anthers cuneate, minute; styles very short, 3-fid. Nuts trigonous, ovate or elliptic, 1.5 mm long.

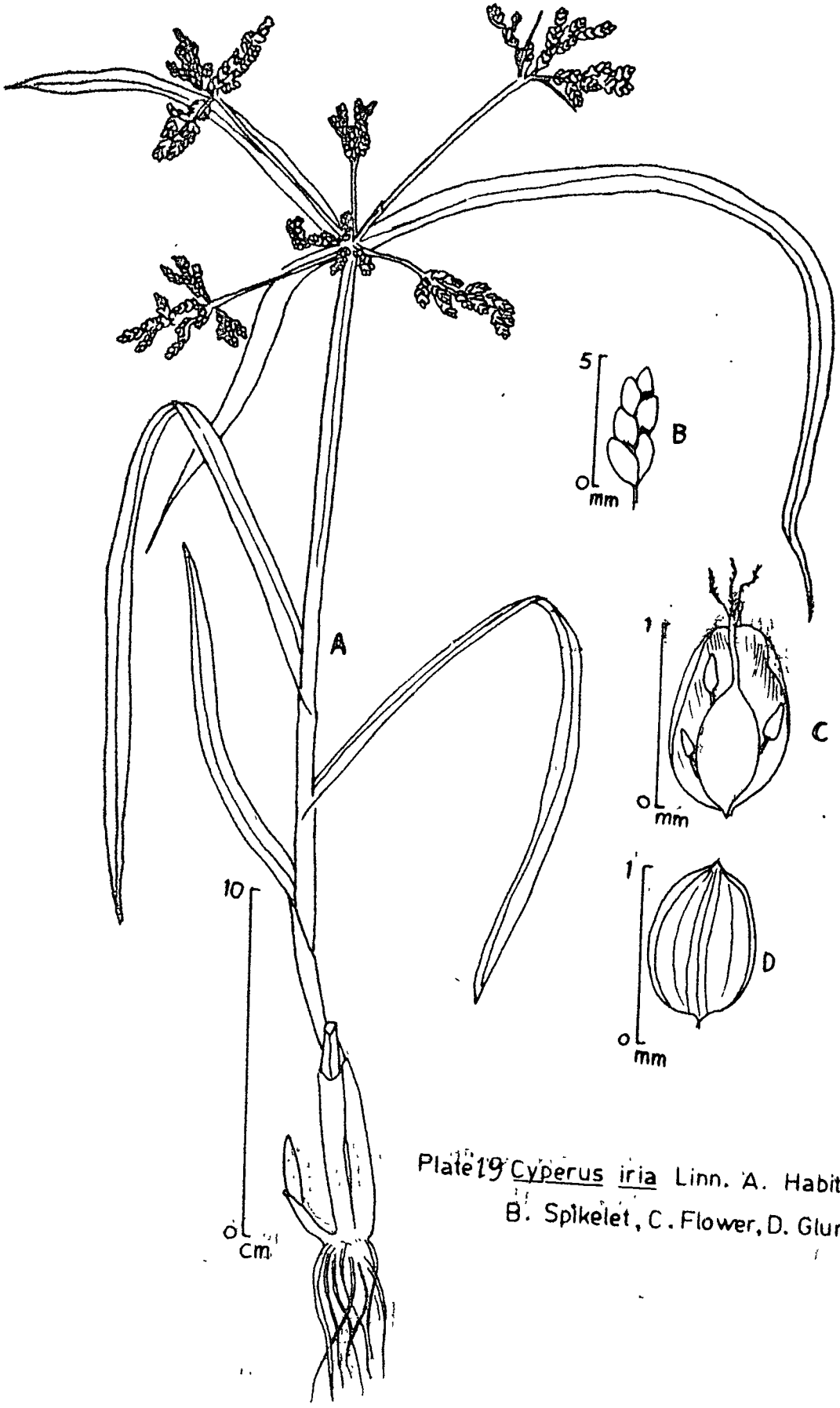

Plate 19 Cyperus iria Linn. A. Habit,
B. Spikelet, C. Flower, D. Glume.

Common in paddy fields and in marshes.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1065 Shillong; 1693 Umling (Khasi Hills).

Cyperus nutans Vahl/ Enum. Pl. 2: 363. 1806; Cl. in Hook. f. Fl. Brit. India 6: 607. 1893; Kern Fl. Males. 1, 7(3): 609. 1952; Babu Herb. Fl. Dehra Dun 558. 1977; Koyama in Gard. Bull. Sing. 30: 136. 1977.

Rhizome woody, short. Culms 60-120 cm high, trigonous. Leaves shorter than the culms, 0.6-1 cm across, scabrid on the margin and on the nerves, apex rounded. Primary bracts leaf-like, 4-5, unequal, 10-30 cm long, imbricate. Secondary bracts filiform, shorter than the rays. Umbels decompound. Spikelets linear. Glumes close, suberect, pale brown, 1.5-2 mm long, nerves obscure, margin hyaline; apex with a stout mucro, as long as or longer than the apex of the glumes. Stamens 3; filaments 0.5 mm long; anthers as long as filaments, cylindric, truncate or subacute; styles short, 3-fid. Nuts straw-coloured, 1-1.5 mm long.

Common in fallows and marshes specially on sandy soils.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1678 Umling (Khasi Hills).

Cyperus pilosus Vahl Enum. Pl. 2: 354. 1806; Cl. in Hook. f. Fl. Brit. India 6: 609. 1893; Babu Herb. Fl. Dehra Dun 559. 1977; Koyma in Hara Fl. East. Himal. 387. 1966 et in Gard. Bull. Sing. 30: 138. 1977.

Rhizome stoloniferous. Roots wiry. Culms 30-60 cm high, trigonous. Leaves as long as or longer than the culms, 5-8 mm across, distinctly 1-nerved, serrate. Bracts leaf-like, 1 cm across, serrate. Umbels compound, 4-25 cm across; secondary umbels with long or short rays. Spikelets pointed downwards, distichously arranged on hispid rhachis, lanceolate, 5-8 x 2-3 mm, acute, compressed. Glumes ovate, 2 mm long, mucronate, keels hyaline; stamens 3; filaments very short; anthers 0.5 mm long, longer than the filaments; styles filiform, shorter than the nuts, 3-fid. Nuts trigonous, suboblong, 1.5 mm long.

Common weed of paddy fields and in marshes.

Fls. & Frts. : August to December.

Specimens examined: Kyrthong 1266 Sohkha (Jaintia Hills); 1089, 3058 Shillong; 1696 Umling (Khasi Hills).

Cyperus pubisquama Steud. Syn. Pl. Glum. 2: 20. 1854; Cl. in Hook.f. Fl. Brit. India 6: 604. 1893; - - C. diffusus ? ? & Vahl var. macrostachyus Boeck. Linnaea 35: 534. 1868.

Rhizome 0. Roots fibrous straw-coloured. Culms 50 cm high, trigonous, glabrous. Leaves radical, as long as the culms, 5-8 mm broad, flat, finely acuminate, margin serrate, sheaths purple. Bracts leaf-like, overtopping the umbels, apex acute or acuminate; margin serrate, 0.5-1 cm across. Umbels compound,

anthelate with 4-6 spikelets; spikelets 6-8 x 2 mm, linear, elongate, slightly compressed, many flowered. Glumes 2 mm long, ovate, mucronate; margin membranous. Bristles 3, strap-shaped, as long as nuts. Stamens 1, anthers very short, brownish yellow. Styles shorter than nuts, 3-fid. Nuts elliptic, trigonous, pointed at both ends, black.

Common in forests, under shrubs or bushes.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1362 Lailad (Khasi Hills).

Cyperus rotundus Linn. Sp. Pl. 45. 1753; Cl. in Hook.f. Fl. Brit. India 6: 614. 1893; Babu Herb. Fl. Dehra Dun 560. 1977; Koyama in Hara Fl. East. Himal. 388. 1966/et in Gard. Bull. Sing. 30: 132. 1977.

Roots fibrous. Culms 20-30 cm high, trigonous. Leaves sub-radical, shorter than the culms, channelled, apiculate, hairy. Bracts leaf-like, longer than umbels. Umbels reduced or congested into a head or with many spikelets with distinct rays. Spikelets sub-cylinaric, 1-2 cm long, chestnut brown with many yellow pendulous anthers. Glumes amplexicual, truncate, shortly lobed, 3-nerved. Stamens 3, filaments short; anthers elongate, cylindric, longer than the filaments, basifixed; styles filiform, 3-fid. Nuts trigonous, smooth.

Common on roadsides, in ditches and in grasslands especially on sandy soils.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1628 Dawki (Jaintia Hills); 1682 Umling (Khasi Hills).

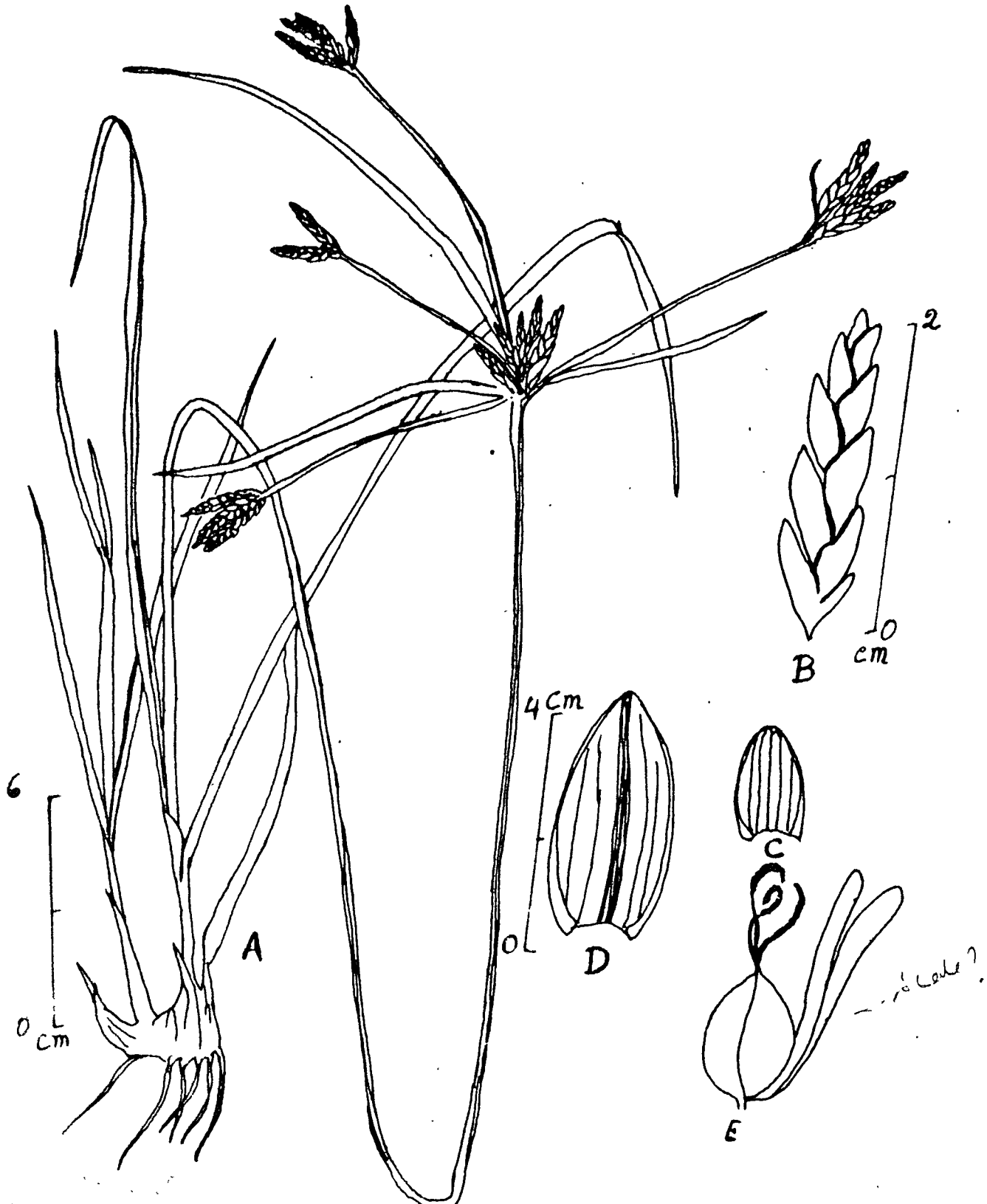

Plate 20 Cyperus tenuiculmis Bock. A.Habit, B.Spikelet, C.Prophyll, D.Glume, E.Gynoecium with bracteoles.

Cyperus tenuiculmis Bock. in Linaea 36: 286. 1870; Kern, Reinwardtia 3: 30. 1954 et in Fl. Males. 7(3): 608. 1974; Koyama in Hara Fl. East. Himal. 3 rep. 126. 1975 et in Gard. Bull. Sing. 30: 135. 1977(Plate 20).

Stolon short. Roots fibrous. Culms 30-80 cm high, trigonous. Leaves shorter than the culms, radical, 4-5 mm across, acute. Bracts leaf-like, longer than umbel. Umbels compound, 4-6 rayed. Spikelets crowded, 2-4 cm long, sub-cylindric, 5-12-flowered. Prophyll about 1 mm long, obtuse, obscurely 2-nerved. Glumes 4-5 mm long, laterally compressed, many nerved, margin hyaline. Stamens 3, anthers linear, yellow; styles filiform, 3-fid, branches coiled. Nuts trigonous, oblong, ovoid.

Common along roadsides, in grasslands and in ditches.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1860 Mawmluh, 1930 May to Turo Peak (Garo Hills); Kharlukhi 6 Shillong.

Cyperus tenuispica Steud. Syn. Glum. 2: 11. 1855; Kern, Reinwardtia 2: 116. 1952; Babu Herb. Fl. Dehra Dun 560. 1977; Koyama in Hara Fl. East. Himal. 389. 1966 et in Gard. Bull. Sing. 30: 143. 1977.

Roots fibrous. Culms 10-25 cm high, tufted, trigonous. Leaves as long as or shorter than the culms, 2 mm across. Bracts leaf-like, as long as or longer than umbels, rays 3-10. Spikelets 3-4 mm long, acute, compressed, brown. Glumes 1.5 mm long, obtuse, median nerve obscure or distinct. Bristles strap-shaped. Stamens 2; anthers obtuse; styles filiform, longer than nuts.

3-fid. Nuts trigonous, ovoid, 1 mm long.

A weed of paddy cultivation.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1638 Jowai (Jaintia Hills); Hynniewta 2108 Shillong(Khasi Hills).

Cyperus tuberosus Rottb. Descr. Icon. Rar. Nov. Pl. 28, t. 7, f. 1. 1773; Cl. in Hook.f. Fl. Brit. India 6: 616. 1893; Koyama,in Gard. Bull. Sing. 30: 133. 1977.

Rhizome slender, woody. Culms 30-40 cm high, trigonous, with sharp angles, glabrous. Leaves 20-30 x 0.2-0.4 cm, scabrid on the margin and on the nerve. Bracts leaf-like, as long as the compound umbel. Rays 6-15, 5-20 cm long. Spikelets linear-lanceolate, 3-4 cm long, slightly compressed, 15-20-flowered. Glumes closely imbricate, nuts not exposed, brown, 7-11-nerved, apex obtuse or mucronate, cymbiform. Stamens 3, filaments 1 mm long; anthers as long as filaments; styles 3-fid. Nuts 2 mm long, oblong, trigonous.

Common in ditches and in grasslands.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 2950 Shillong.

Cyperus zollingeri Steud. Syn. Pl. Glum. 2: 17. 1855; Cl. in Hook.f. Fl. Brit. India 6: 613. 1893; Kern, Reinwardtia 3: 28. 1954 et in Fl Males. 1, 7(3): 608. 1974; Koyama, in Gard. Bull. Sing. 30: 135. 1977.

Stolons short. Culms solitary, 30-50 cm high, trigonous, glabrous, base thickened with 1-2 offshoots. Leaves shorter than culms, 3-5 mm across, convolute when dry, striate with numerous hexagonal cells inbetween the striations, scabrid on the margins. Bracts leaf-like, as long as or longer than the umbel. Umbels 3-5 rayed. Spikelets few, 1-2 cm long, sub-compressed, linear, acute, few flowered, green or pale green. Glumes 2-3 mm long, cymbiform, 7-11-nerved, obtuse, keel glabrous, green. stamens 3, filaments flat, anthers 2 mm long; styles 2-fid, branches as long as or longer than the nuts. Nuts oblong, triquetrous, 2 mm long.

Common in ditches and marshes, in association with grasses. Frequent weed of paddy fields too.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 2949 Shillong.

Eleocharis R. Br.

Perennial herbs, culms embraced by sheaths. Leaves 0. Inflorescence a solitary, terminal (rarely more) spikelet. Spikelets many flowered, ovoid, cylindric or sometimes proliferous. Glumes membranous. Basal ones empty. Hypogynous bristles 5-8, scabrid. Stamens 1-3; anther linear, oblong, not crested. styles 2-3-fid; style base swollen, conical, persistent. Nuts ovoid, plano-convex.

K E Y T O S P E C I E S

1a. Culms more than 4 mm across.
  2a. Culms distinctly septate when dry; nuts smooth . . . . . dulcis
  2b. Culms not septate; nuts reticulate or tuberculate.
    3a. Culms triquetrous below the spikelet, bristles 6; nuts unequally bi-convex . . . . . acutangula
    3b. Culms nearly terete; bristles 7; nuts otherwise . . . . . variegata
1b. Culms less than 4 mm across.
  4a. Styles 2-fid . . . . . palustris
  4b. Styles 3-fid.
    5a. Culms subterete, striat. spikelets lanceolate; glumes closely imbricate . . . . . congesta
    5b. Culms triquetrous; spikelets ellipsoid or oblong; glumes rather lax . . . . . tetraquetra

Eleocharis acutangula (Roxb.) Schult. Mant. Syst. 2: 91. 1824; Babu Herb. Fl. Dehra Dun 562. 1977. - - Scirpus acutangula Roxb. Fl. Ind. ed Carey & Wall. 1: 213. 1820. - - Eleocharis fistulosa Schult. Rar. 1804 non Forsk. 1775. - - E. fistulosa Schult. Mant. 2: 89. 1824; Cl. in Hook.f. Fl. Brit. India 6: 626. 1893.

Rhizomes short. Culms caespitose up to 60 x 0.4-0.6 cm, triquetrous below the spikelets. Leaves 0. Sheaths hyaline, membranous, oblique. Spikelets 2-4 cm long. Glumes imbricate, 3 mm long, ovate-oblong, many nerved. Bristles 6, as long as

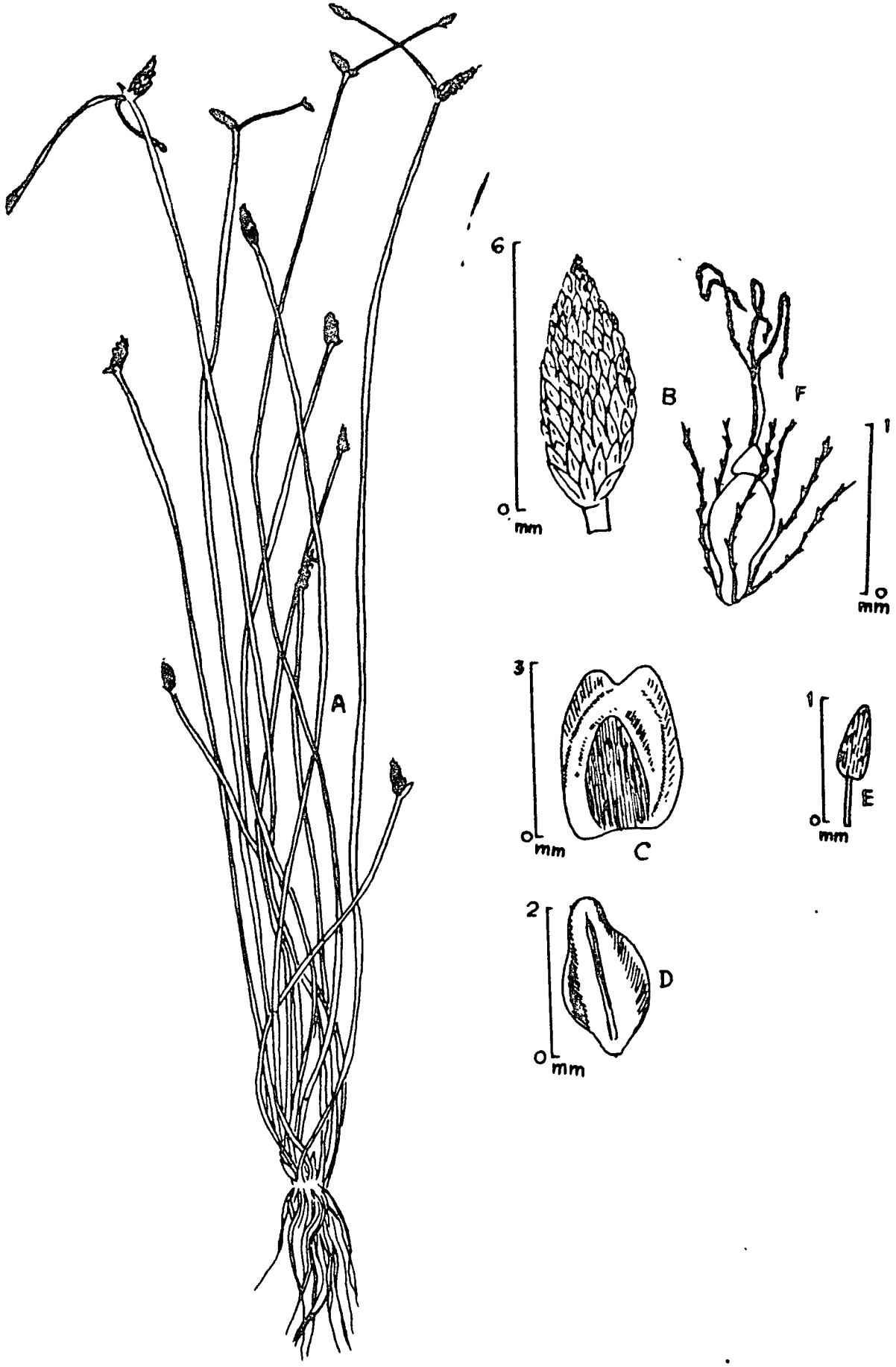

Plate 21 Eleocharis congesta D. Don A. Habit, B. Spikelet, C. Prophyll, D. Glume, E. Stamen, F. Nut with presistent style and Bristles at the base.

the cancellate nuts, scabrous. Stamen 1; filaments very short; anthers linear, 1 mm long; styles 3-fid; style base conic. Nuts 1 mm long, cuneate, base narrow, with many longitudinal striations.

Rare; occur in shallow water, ponds in lower elavations.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1968 Baghmara (Garo Hills).

Eleocharis congesta D. Don Prodr. Fl. Nepal. 41. 1825; Cl. in Hook.f. Fl. Brit. India 6: 630. 1893; Kern, Reinwardtia 6(1): 35. 1961; Koyama in Hara Fl. East. Himal. 390. 1966. - - E. afflata Steud. Syn.Pl. Glum. 2: 76. 1855; Cl. in Hook.f. Fl. Brit. India 6: 629. 1893 (Plate 21).

Vern.-' Langsymputjem ' (K).

Culms tufted, slender, triquetrous, striate, basal portion with brown colour; upper sheath truncate with a lateral tooth-like. Leaves 0. Spikelets oblong, terminal, acute. Glumes dense, imbricate. Lowest one ovate, obtuse, obscurely 2-lobed, mottled with pinkish brown spots all over. Upper ones lanceolate, 2 mm long, obtuse, 1-nerved. Bristles 6-7, spinous. Stamens 1, filaments flat; anthers 1 mm long, cuneate; styles filiform, bulbous at the base, 3-fid, branches coiled. Nuts ovate-lanceolate, narrowed from both ends, with a distinct style base.

Common in paddy fields, marshes and in sources of springs.

Fls. & Frts. : June to February.

Specimens examined: Myrthong 1589 Jowai (Jaintia Hills); 1098 Barapani (Khasi Hills).

Eleocharis dulcis (Burm.f.) Trin. ex Hens. Vita Rumph. 186. 1833; Koyama in Hara Fl. East. Himal. 390. 1966. - - Andropogon dulce Burm.f. Fl. Ind. 219. 1768. - - Eleocharis plantaginea (Retz.) Rom. et Schult. Syst. Veg. 2: 150. 1817; Cl. in Hook.f. Fl. Brit. India 6: 625. 1893.

Rhizome 0. Culms 80 cm high or more, terete and distinctly septate when dry, striate. Sheaths membranous, close. Spikelets 2-6 cm long, hardly broader than culms, terete, pale straw coloured. Glumes numerous, densely imbricate; lowest one as if a continuation of the culm, wholly or partly surrounding the culms, sterile. Fertile glumes 4 mm long, oblong, apex rounded, 1-nerved, margin crested, hyaline. Bristles 7, scabrid; stamens 3; filaments short; anthers linear, 2 mm long, pointed or beaked; styles 3-fid, branches hairy or plumose, 2 mm long. Nuts 1.5 mm long, obscurely trigonous.

Occur in shallow water ponds and paddy fields.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1975 Baghmara (Garo Hills).

Eleocharis palustris (Linn.) R. Br. Prodr. Fl. Nov. Holl. 224. 1810; Cl. in Hook.f. Fl. Brit. India 6: 628. 1893. - - Scirpus palustris Linn. Sp. Pl. 70. 1753.

Rhizomes short, brown. Culms 15-30 x 0.1-0.2 cm, terete, striate. Spikelets 0.5-1.5 cm long, pointed, many flowered. Glumes 2.5 mm long, ovate-oblong, loosely imbricate, reddish brown with broad translucent, whitish margins and a green keel, nerveless. Stamens 1-3, filaments short; anthers nearly straight,

1 mm long. Bristles 4-7, scabrid. Stamens 1-3, filaments 0.5 mm long, white; anthers 1 mm long, constricted near the apex and expanded; styles 2-fid. Nuts 1 mm long.

Common in paddy fields and in marshes, usually associated with grasses.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1460 Phulbari (Garo Hills).

Eleocharis tetraquetra Nees in Wight Contrib. 113. 1834; Cl. in Hook.f. Fl. Brit. India 6: 630. 1893.

Rhizomes stout, ascending. Culms 20-30 cm high, tufted, striate, subterete . Base covered with rusty brown violet sheaths; uppermost sheaths triangular, with a mucro. Spikelets 0.8-1.5 cm long, blackish brown. Glumes 2 mm long, ovate-oblong, keel brown at the base, green above, 1-nerved, toothed above. Stamens 3, filaments less than half a milimeter; anthers 1 mm long, penicellate or beaked, subcylindric; styles 3-fid, flat, expanding above, branches hairy below and plumose at the tip; bristles 7, scabrid. Nuts as long as or shorter than stamens.

A weed of cultivation; and in marshes forming green patches.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1512 Shillong.

Eleocharis variegata (Poir.) Presl. in Oken Isis 21:269. 1828; Cl. in Hook.f. Fl. Brit. India 6: 626. 1893; Kern in Reinwardtia 4(1): 95. 1956.

Culms erect, distinctly trigonous, 30-40 cm high. Leaves reduced to sheaths; sheaths membranous, violet brown. Spikelets 3-4 cm long, hardly broader than culms. Lowest glume sterile. other glumes ovate, with 1 stout prominent nerve and 3-5 marginal nerves on each side; margin hyaline. Bristles 7, longer than nuts, with retrorse hairs. Anthers linear; styles 3-fid; style base conic. Nuts 1 mm long, oblong, ovoid, base narrow, broader in the shoulder, truncate, striate; outer surface cancellate.

Common in marshes, in shallow water ponds and in stagnant waters.

Fls. & Frts, : August to October.

Specimens examined: Myrthong 1018 Barapani (Khasi Hills).

Fimbristylis Vahl

Perennial or annual herbs. Leaves subradical, linear, narrow or filiform. Inflorescence a decompound or supra-decompound umbels or reduced to a few spikelets. Spikelets solitary or in clusters, cylindric or cuneate or ovid, many flowered. Glumes imbricate, spirally arranged on the rhachilla . Stamens 1-2, anterior. Bristles 0. Styles flat, 2-3-fid, compressed at least below the bi or tri-furcation; style base persistent, if deciduous not leaving a tumour on the nuts.

K E Y T O S P E C I E S

1a. Glumes glandular, all over . . . . cinnamomentorum

1b. Glumes not glandular.

2a. Terrestrials;

3a. Styles 2-fid.

4a. Spikelets green, glumes loosely packed towards the apex with filiform tip . . . . . hookeriana

4b. Spikelets brown, glumes equally packed.

5a. Culms and leaves very hairy; rarely glabrous; style base trichome-like . . . . . dichotoma

5b. Culms and leaves glabrous; style base not trichome-like. . falcata

3b. Styles 3-fid.

6a. Spikelets 1-5, clustered . . . tenera

6b. Spikelets numerous.

7a. Spikelets fusiform, angular, glumes keeled . . . . complanata

7b. Spikelets terete; glumes not keeled . . . . . thomsonii

2b. Marshy or semi-aquatic plants.

8a. Spikelets globose.

9a. Inflorescence a simple umbel of few spikelets; spikelets 2-5 mm long; pale or straw coloured . . globosus

9b. Inflorescence decompound and supra-decompound; spikelets usually many, 1-2 mm long. . . . . miliacea

8b. Spikelets cylindric or fusiform.

10a. Spikelet solitary; nut transversely wrinkled.

11a. Spikelets 1-1.5 cm long, terete, acute, pale green; styles 2-fid . . . acuminata

11b. Spikelets subglobose, less than 1 cm long; obtuse; styles 3-fid. . tetragona

10b. Spikelets clustered.

12a. Culms tufted, 2-15 cm high, spreading from base; spikelets minute, 2-3 mm long; glumes 1 mm long, 1-nerved, aristate. . . . aestivalis

12b. Culms more than 15 cm high; spikelets 0.5-1.5 cm long; glumes more than 2 mm long, many nerved, not aristate. . . . . schoenoides

Fimbristylis acuminata Vahl. Enum. Pl. 2: 285. 1805; Cl. in Hook.f. Fl. Brit. India 6: 631. 1893.

Rhizome 0. Roots fibrous, tufted. Culms 20-30 cm high, tufted, angular, terete. Leaves 0. Sheaths brown. Spikelets terminal, solitary, 1-1.5 cm long, terete, acute, pale green. Glumes 4 mm long, lanceolate, cymbiform, faintly spotted near the median nerve, 1-nerved; apex rounded or mucronate. Stamens 1-3, short, about as long as the nuts, filaments shorter than the short anthers; styles 2-fid, thickened towards the base, longer than the nuts. Nuts ovoid, oblong, about 1 mm long, truncate.

Common in marshes and in paddy fields.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1408 Baghmara, 1960 Way to Baghmara (Garo Hills).

Fimbristylis aestivalis (Retz.) Vahl. Enum. Pl. 2: 288. 1805 et in Hook.f. Fl. Brit. India 6: 637. 1893; Koyama in Hara Fl. East. Himal. 390. 1966. - - Scirpus aestivalis Retz. Obs. 4: 12. 1786.

Tufted plants. Culms 2-15 cm high, spreading from base, trigonous. Leaves as long as or shorter than the culm, apex rounded, margin scabrid. Bracts leaf-like, setaceous. Umbels simple or compound with few spikelets. Spikelets clustered or solitary, 2-3 mm long. Glumes 1 mm long, ovate, aristate, with 1 distinct median nerve, margin membranous. Stamens 2, filaments less than 1 mm; anthers yellow, shorter than filaments; styles 2-fid. Nuts minutely reticulate, 0.5 mm long.

Common in fallows and in marshes; also a weed of cultivation.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1505 , 1508 Umsning (Khasi Hills).

Fimbristylis cinnamometorum (Vahl) Kunth Enum. 2: 229. 1837; Kern in Blumea 15(2): 433. 1967. —— Banerjee & Bhattacharyya.

Rhizomes short. Culms filiform, 30-50 cm high, trigonous, twisted, glabrous. Leaves as long as or longer than stem, channelled, apex oblique, rounded, margin sparsely scabrid. Bracts leaf-like, much shorter than the umbels. Umbels decompound and supra-decompound, branches filiform, glabrous. Spikelets few flowered, 4-5 mm long, linear, acute. Glumes lanceolate, 1 mm long, acute, with membranous brown warts all over the surface. Stamens 3, filaments very short; anthers cylindric, about 1 mm long, beaked, basifixed; styles filiform, 3-fid, 2 mm long, branches brown, coiled. Nuts cylindric, 1 mm long with transverse cells.

Common in grasslands, in moist situations.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1097 Shillong; 3294 Nongpoh (Khasi Hills).

Fimbristylis complanata (Retz.) Link. Hort. Bot. Beral. 1: 292. 1827; Cl. in Hook.f. Fl. Brit. India 6: 646. 1893; Koyama in Hara Fl. East. Himal. 390. 1966; Babu Herb. Fl. Dehra Dun 564. 1977.- - Scirpus complanatus Retz. Obs. Bot. 5: 14. 1789.

Rhizomes very short. Culms 15-60 cm high, trigonous, flat at least below the umbels, glabrous. Leaves as long as the culms, glabrous, margin scabrous, apex acuminate. Bracts leaf-like, shorter than umbels. Inflorescence a decompound and supra-decompound umbel. Spikelets fusiform, 0.5-1 cm long, angular, chestnut brown, acute. Glumes ovate, 2 mm long, acute, keeled, glabrous. Stamens 3, filaments shorter than anthers; anthers minute, .5 mm long: styles 3-fid, 1.5 mm long. Nuts ovoid, oblong or cuneate, verrucose, .5 mm long.

Common in abandoned cultivated lands, in marshes usually associated with grasses and other sedges.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1084 , 1019, 3059 Shillong; 1306 Dawki (Jaintia Hills).

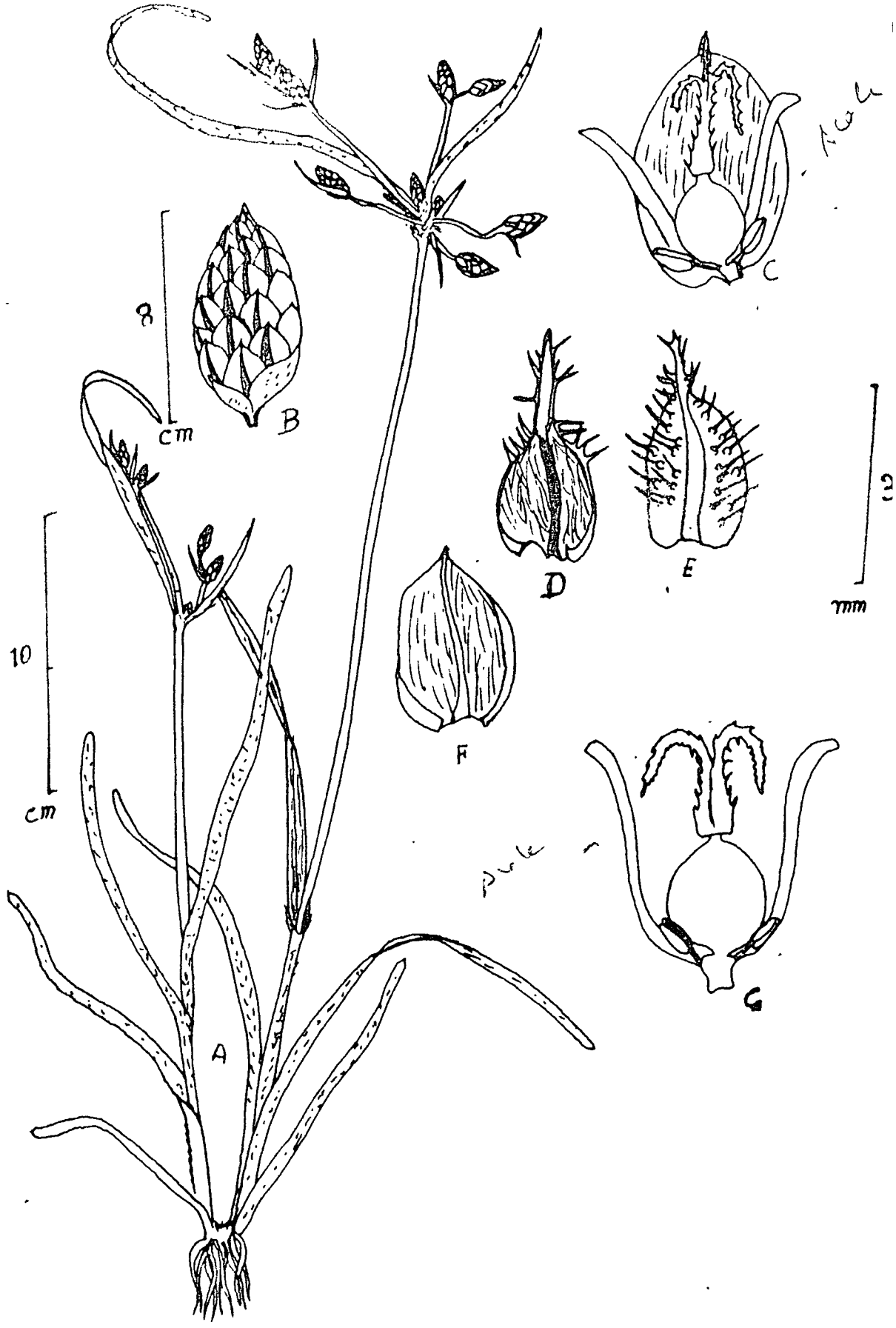

Plate 22 Fimbristylis dichotoma Vahl. A.Habit B.Spikelet, C.Flower, D.Empty Glume (ventral view), E. Same (dorsal view), F.Fertile Glume, G. Pistil with Androecium and 2 strapshaped reduced glumes.

Fimbritylis dichotoma (Linn.) Vahl/ Enum. 2: 287. 1806; Kern in Reinwardtia 6: 46. 1961; Koyama in Hara Fl. East. Himal. 3 rep. 1975; Babu Herb. Fl. Dehra Dun 565. 1977. - - Scirpus dichotomus Linn. Sp. Pl. 50. 1753. - - S. diphyllus Retz. Obs. 5: 15. 1789.- - Fimbristylis diphylla (Retz.) Vahl/ Enum. Pl. 2: 287. 1805; Cl. in Hook.f. Fl. Brit. India 6: 636. 1893(Plate 22).

Annual grass-like herbs. Culms solitary or tufted, 20-40 cm high, striate, slightly compressed, hairy below the umbel. Leaves 6-15 x 0.1-0.2 cm, upper ones very hairy, margin scabrid, apex obtuse, sheaths close, glabrous below and densely hairy near the junction. Ligule a ring of cilia. Bracts leaf-like. Umbels with few spikelets, central spikelets sessile, cylindric, acute, fusiform, 4-8 mm long; basal glumes empty, very hairy with spinous tubercle based hairs, on the dorsal face, 2-3 mm long, broader at base, strongly 1-nerved; other glumes glabrous, 3 mm long, acute, strongly 1-nerved. Stamens 1-3, filaments 1 mm long, anthers longer than filaments; styles 2-fid, hairy. Nuts ovoid, 2 mm long, beaked, covered with thick membrane on the edges.

Common in marshes and paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 3005 Tasak (Garo Hills); 3298 Umsning (Khasi Hills).

Fimbristylis falcata (Vahl.) Kunth Enum.Pl. 2: 239. 1837; Koyama in Hara Fl. East. Himal. 3 rep. 127. 1975. - - Scirpus falcatus Vahl. Enum. Pl. 2: 275. 1806. - - Fimbristylis junciformis (Nees) Kunth Enum. Pl. 2: 239. 1837; Cl. in Hook.f. Fl. Brit. India 6: 647. 1893.

Rhizomes stout, prostrate or 0. Culms 15-40 cm high, trigonous, profusely spreading or erect. Leaves as long as or shorter than the stem, flat, undulated, glabrous, margins scabrid, apex rounded, with 1 distinct nerve. Bracts leaf-like, as long as umbels or shorter. Umbels decompound or supra-decompound. Spikelets chestnut brown, cylindric, acute, 3-6 mm long. Glumes 2 mm long, ovate, apex rounded, margin chestnut brown, nerve green or brown. Stamens 1, filaments long, 1 mm long; anthers 5 mm long; styles 2-fid, 2 mm long, very hairy, below the bifurcation, flat, base subconic, branches short, reflexed. Nuts oblong, longitudinally striated, 1 mm long.

Common in grasslands in association with many herbaceous plants.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1538 Shillong; 1248 Mawmluh; 1549 Lailad, 1818 Markasa (Khasi Hills); 1636 Jowai (Jaintia Hills).

Fimbristylis globulosa Kunth Enum. Pl. 2: 231. 1837; Cl. in Hook.f. Fl. Brit. India 6: 644. 1893.

Rhizomes thick, woody. Culms tufted, 30-50 cm high, terete, fleshy, striate. Leaves reduced to sheaths at the base of the culm. Bracts very short, glumaceous, 0.5-1 cm long. Umbels simple or compound, of few spikelets. Spikelets globose or subglobose, 2-5 x 2-3 mm, many flowered. Glumes about 2 mm long, flat, concave, 1-nerved, brown, margin hyaline, membranous, apex rounded. Stamens 3; filaments very short; anthers 1 mm long, slightly curved; styles 3-fid, 5-8 mm long, branches more than half of the style. Nuts ovoid, rough, 3-4 mm long, cuneate.

A weed of paddy cultivation, in warmer parts of Meghalaya.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1722 Burnihat (Khasi Hills); 1984 Baghmara (Garo Hills).

Fimbristylis hookeriana Boeck. in Linnaea 37: 22. 1873; Cl. in Hook.f. Fl. Brit. India 6: 641. 1893.

Annual herbs. Roots fibrous. Culms tufted, 5-20 cm high, striate. Leaves as long as or longer than the culms, 1-2 mm broad, apex subacute or rounded, glabrous or slightly hairy on the dorsal face. Bracts leaf-like, twice as long as the umbels; bracteoles shorter than umbels. Umbels with few spikelets, 0.5-1 cm long, cylindric, green, erect or horizontal. Glumes lax towards the apex. Lowest glume empty, 4 mm long, acute, strip with interrupted brown striations. Flowering glumes similar in texture as the empty glumes, lanceolate,

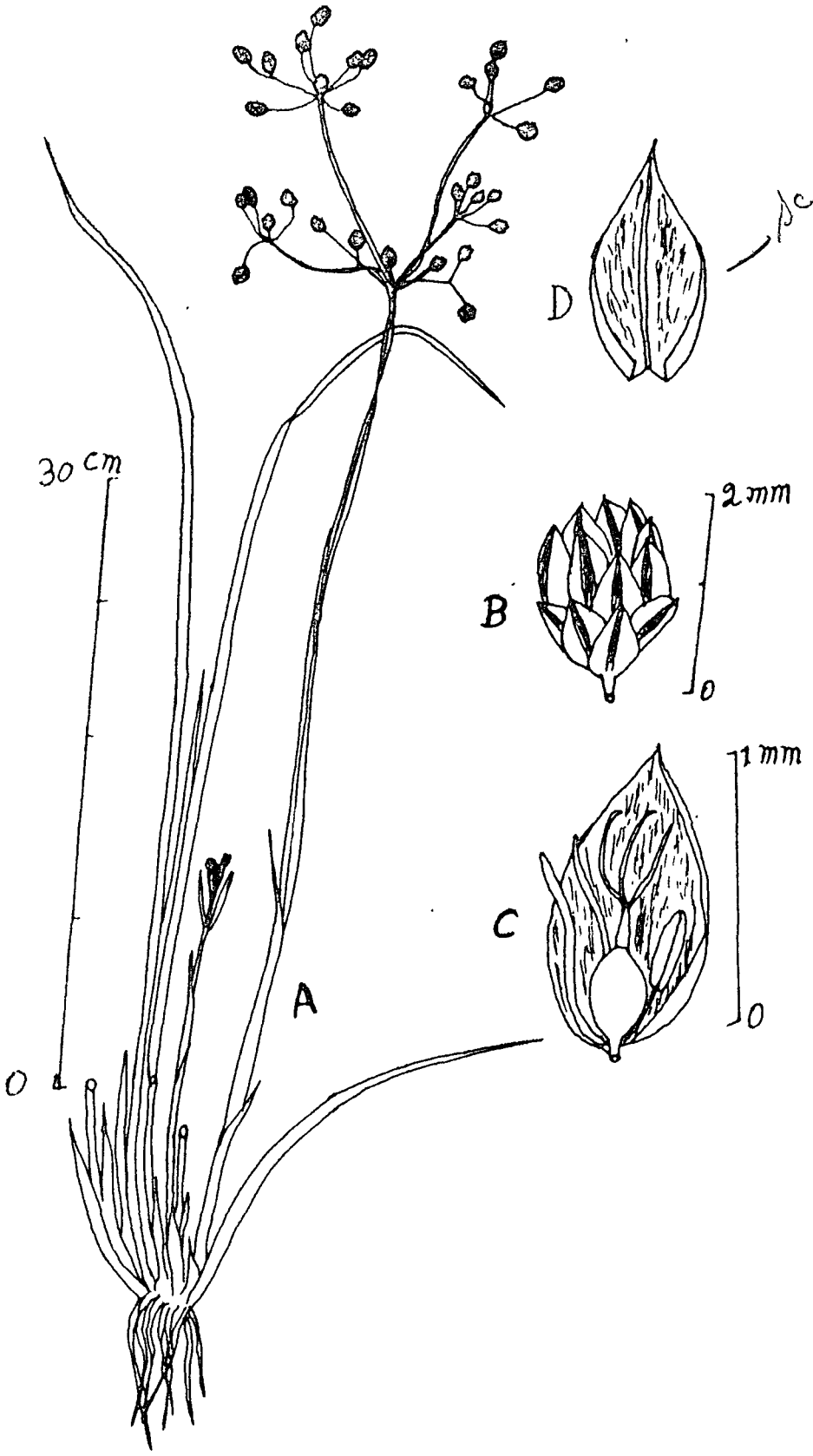

Plate 32 Fimbristylis miliacea (Linn.) Vahl. A. Habit, B. Spikelet, C. Flower, D. Glume

caudate. Stamens 2; filaments 2 mm long; anthers 1 mm long, subcylindric, truncate, 2-celled; styles 2-fid, flat, style base brown, bulbous, deciduous, hairy; stigmatic branches brown. Nuts elliptic or cuneate, 1.5 mm long.

Common on grass-covered rocky surfaces.

Fls. & Frts.:& August to October.

Specimens examined: Myrthong 1232 Mawmluh (Khasi Hills).

Fimbristylis miliacea (Linn.) Vahl Enum. Pl. 2: 287. Cl. in Hook.f. Fl. Brit. India 6: 644. 1893; Kern Taxon 3: 246. 1954; Koyama in Hara Fl. East. Himal. 391. 1966; Babu Herb. Fl. Dehra Dun 565. 1977. - - Scirpus miliaceus Linn. Syst. Nat. ed 10: 868. 1759 (Plate 32).

Vern. - ' Dum ' (K).

Culms tufted, 10-40 cm high, terete, longitudinally striate. Leaves variable, longer or very much shorter than the culms or sometimes reduced to sheaths, closely nerved, apex rounded. Umbels decoumpound or supra-decompound. Spikelets many to few, globose, 1-2 mm long, many-flowered. Glumes cymbiform, brown, lanceolate, apex rounded, about 0.5 mm long, with a median, green nerve. Stamens 3, very short, less than half a milimeter; anthers cylindric; styles 3-fid, base swollen. Nuts trigonous with numerous transverse cells and longitudinal striations, very minute, oblong, cuneate.

Common in paddy fields and in marshes.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1099 Shillong; 1560, 1681 Umling, 1741 Burnihat (Khasi Hills).

Fimbristylis schoenoides (Retz.) Vahl, Enum. Pl. 2: 286. 1806; Cl. in Hook.f. Fl. Brit. India 6: 634. 1893; Koyama in Hara Fl. East. Himal. 391. 1966; Babu Herb. Fl. Dehra Dun 566. 1977. - - Scirpus schoenoides Retz. Obs. Bot. 5: 14. 1789

Rhizome short, bulbous, clothed with fibrous scales. Culms 30-40 cm high, terete, longitudinally striate. Leaves radical, shorter than culms, 1-1.5 mm broad, apex rounded, unequally oblique, margin scabrous. Spikelets 1-3, on each culm, terminal, 0.5-2 x 0.5 cm, many flowered, ovoid, or elongate, usually brown when dry. Glumes 2-4 mm long, many nerved, apex rounded or mucronate, many-celled in between the nerves. Stamens 3, about 1 mm long; filaments as long as the anthers; styles 2-fid. Nuts sub-compressed, punctate, ovoid, oblong, narrowed at base, shining or granular.

Common in paddy fields and in marshes in association with grasses and other sedges.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1092 Shillong, 1204 Cherrapunjee (Khasi Hills).

Fimbristylis tenera Roem. et Schult. Mant. Syst. 2: 57. 1824; Cl. in Hook.f. Fl. Brit. India 6: 642. 1893; Babu Herb. Fl. Dehra Dun 566. 1977.

Rhizomes thick, short. Roots fibrous. Culms 20-40 cm high, trigonous, rough. Leaves 10-15 cm long, glabrous, abruptly acute at apex. Bracts leaf-like, very short, 1-2 cm long, Umbels simple. Spikelets 1-6, 5-8 mm long, chestnut brown,acute. Glumes 2-3 mm long, ovate, brown, distinctly 1-nerved, apex mucronate. Stamens 3; filaments 8 mm long; anthers about 1 mm long, 2-celled, linear acute, yellowish; styles 3-fid, 1-5 cm long, slightly scabrid, branches coiled, as long as style, rough. Nuts dirty white, ovoid, shorter than style.

Common in grasslands in open areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1579 Jowai (Jaintia Hills); 1715 Shillong (Khasi Hills).

Fimbristylis tetragona R. Br. Prodr. 226. 1810; Cl. in Hook.f. Fl. Brit. India 6: 631. 1893.

Culms few, filiform, 20-30 cm high, trigonous, slightly compressed,scabrid. Leaves reduced to sheaths at the base of culms. Spikelets solitary, terminal, subglobose or elongate, 0.5-1 cm long, obtuse. Bracts glumaceous. Glumes oblong, rounded, 2 mm long, membranous, obscurely nerved or with a black median nerve. Stamens 3 (-2), filaments short; anthers flat or cylindric, 1 mm long; styles 3-fid, 1 mm long, flat, hairy, especially below the trifurcation, base thickened, Nuts linear, nearly straight

with transverse outer cells.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1982 Baghmara (Garo Hills).

Fimbristylis thomsonii Bock. in Linnaea 36: 37. 1870; Cl. in Hook.f. Fl. Brit. India 6: 646. 1893.

Rootstock stout, condensed. Culms 30-50 cm high, triquetrous, subterete, striate, glabrous. Leaves 15-30 x 0.2-0.4 cm, glabrous, margin scabrid, apex rounded. Bracts leaf-like, much shorter than the umbel. Umbels decompound. Spikelets 8 mm long, lanceolate or cylindric, chestnut brown. Glumes ovate-lanceolate, 2.5 mm long, mucronate, cymbiform, margin membranous, striate. Stamens 1-3, filaments less than half a milimeter; anthers 1.5-2 mm long, linear; styles 3-fid, branches as long as anthers, undulated, brown. Nuts trigonous, oblong or cuneate.

Common in open areas, and in grasslands.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1554 Umling; 1716 Shillong, (Khasi Hills); 1615 Nongtalang; 3108 Garumpani (Jaintia Hills).

Fuirena Rottb.

Perennial or annual glabrous or pubescent sedges. Culms terete, striate, jointed, enclosed by the leaf sheaths in most part. Leaves subulate or linear with serrated margins. Spikelets in clusters, terminal and axillary, many flowered. Glumes imbricate all round the rhachilla, strongly carinate. Hypogynous bristles 3-6, in 2-series or 0. Glumes perianth-like,

6, in 2 series; stamens 3 (-2); styles long, slender 3-fid. Nuts small, obovoid or ovoid, trigonous, stipitate, reticulate or tuberculate, beaked.

K E Y T O S P E C I E S

1a. Spikelets in clusters of 3-10; inner bristles stalked, sagittate at base . . . . ciliaris

1b. Spikelets more than 10; inner bristles sessile, not sagittate base . . . . . umbellata

Fuirena ciliaris (Linn.) Roxb. Fl. Ind. 1: 184. 1820; Scirpus ciliaris Linn. Mant. Alt. 182. 1771. - - Fuirena glomerata auct. non Lamk. 1791. Cl. in Hook.f. Fl. Brit. India 6: 666. 1893.

Roots fibrous. Culms 20-50 cm high, terete with longitudinal striations. Leaves with hispid sheaths, 4-10 x 0.3-0.5 cm, pubescent, acute. Bracts leaf-like, longer than the umbel. Inflorescence terminal or axillary with many spikelets, usually 3-10, in each umbel. Spikelets terete, acute, deep green. Glumes aristate, base sagittate, stalked. Stamens 3, anthers yellow, cuneate. Bristles 3, clavate, sagittate at base, glume-like; styles filiform, 3-fid, branches very short. Nuts trigonous, 1 mm long.

Common weeds in paddy fields.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1410 Baghmara (Garo Hills).

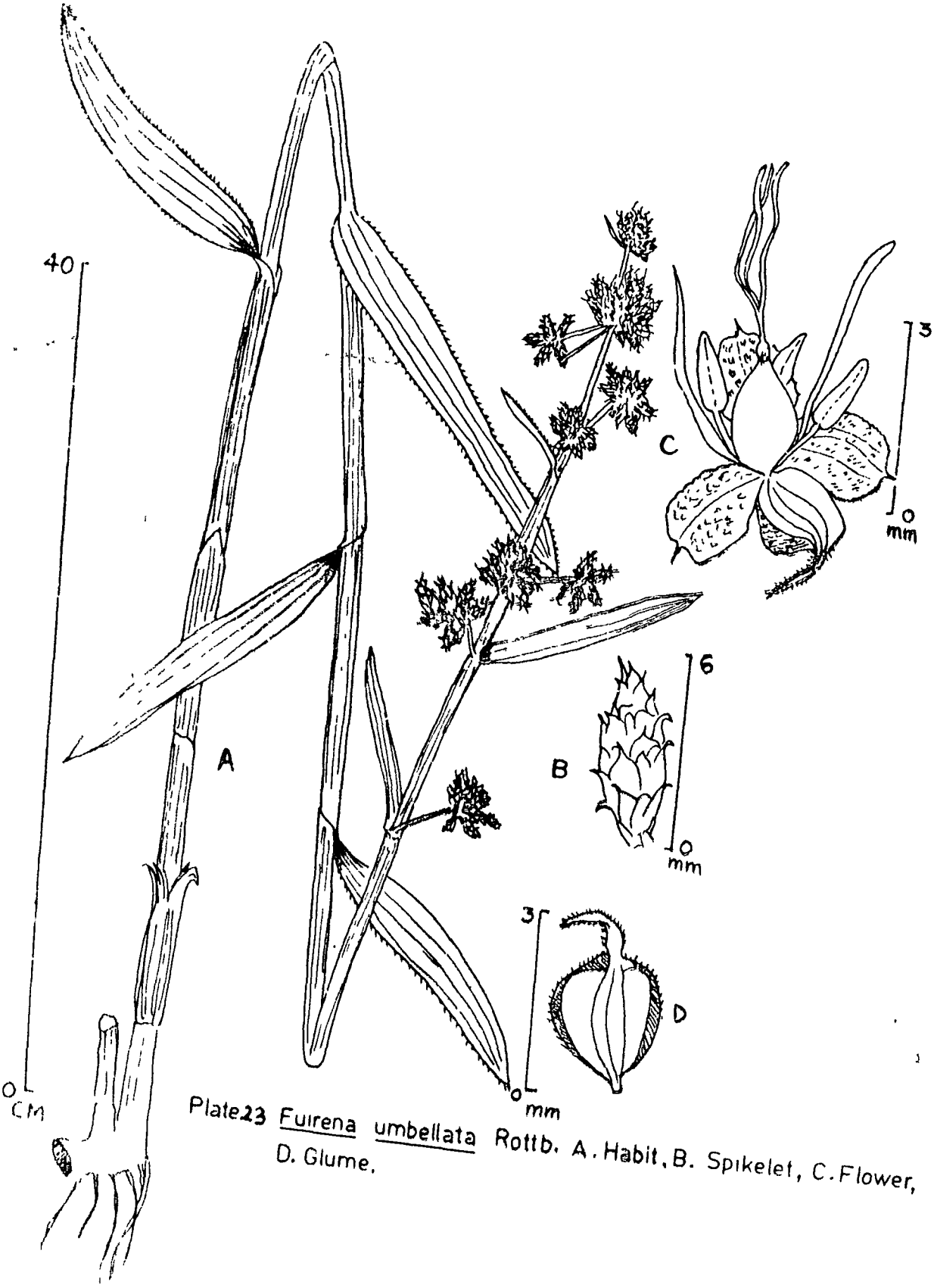

Plate 23 Fuirena umbellata Rottb. A. Habit, B. Spikelet, C. Flower, D. Glume.

Fuirena umbellata Rottb. Descr. Icon Pl. 70,t. 19,f.3. 1773; Cl. in Hook.f. Fl. Brit. India 6: 666. 1893 (Plate 23).

Rhizomes creeping. Culms 1.5 m high, 5-angled, sheaths completely covering the internode, hairy. Leaves lanceolate, 15 x 1 cm, tomentose, 5-nerved, acuminate, margin serrate. Bracts leaf-like, much longer than the umbel. Spikes axillary, umbellate, at the axil of each bract. Spikelets clustered, deciduous, lanceolate, acute, 6 mm long, many flowered. Glumes 3 mm long, aristate, 3-nerved; inner glumes reduced to oblong membranous scales with a short mucro at the apex of the notch. Stamens 3, filaments 1 mm long; anthers cuneate, as long as filaments. Styles short, 3-fid, base bulbous.

Common in marshes and in abandoned cultivated lands

Fls. & Frts. : February to December.

Specimens examined: Myrthong 1360 Lailad; 1504 Unsning (Khasi Hills); 1434 Baghmara (Garo Hills).

Kyllinga Rottb.

Perennials. Culms sharply trigonous. Leaves subradical. Spikelets small, condensed in globose head; 1-2-flowered. Glumes 4-5, distichous on the rhachilla, keeled or not. Stamens 1-3, styles 2-fid. Nuts laterally compressed.

K E Y T O S P E C I E S

1a. Glumes winged. . . . . nemoralis

1b. Glumes not winged.

2a. Rhizomes short; culms tufted, thickened at base;

central spikes globose or ovoid. . . triceps

2b. Rhizomes long, prostrate; culms distantly or closely arranged along the prostrate rhizomes; central spike cylindric, elongate.

3a. Culms 20-40 cm high; closely arranged on rhizomes . . . . . : melanosperma

3b. Culms hardly up to 20 cm high, distantly placed on rhizome . . brevifolia

Kyllinga brevifolia Rottb. Descr. Icon. Rar. Nov. Pl. 3: t. 4. f. 3, 1773; Cl. in Hook.f. Fl. Brit. India 6: 588. 1893; Koyama in Gard. Bull. Sing. 30: 163. 1977.

Rhizomes prostrate. Culms 7-30 cm high, leafy above. Leaves 5-15 x 0.3-0.5 cm, glabrous, median nerve prominent, margin scabrid. Bracts leaf-like, as long as or longer than the leaves. Spikes reduced to a single globose head, 5-8 mm long. Flowers bisexual, 2 mm long, ovate-lanceolate, oblique, acute. Sterile glumes about 1 mm long, acute, margin hyaline, 3-nerved at base, obscure towards the apex, median nerve prominent. Fertile glumes ovate-lanceolate, with 1 prominent median nerve, mottled with brown longitudinal stripes, margin hyaline, apex ending in a stout subcylindric mucro, keel scabrid. Stamen 1, filament flat, hyaline, less than half a milimeter; anthers 1 mm, subcylindric; styles 2-fid. Nuts 1 mm long, oblong, ovoid.

Common in ditches and embankment in the fields.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 2949 Shillong.

Kyllinga melanosperma Nees in Wight Contrib. 91. 1834; Cl. in Hook.f. Fl. Brit. India 6: 588. 1893; Koyama in Gard. Bull. Sing. 30: 159. 1977.

Rhizomes short, 5 cm long. Culms arranged on one side of the rhizome, 20-40 cm high, trigonous below the inflorescence. Leaves shorter than the culms, 2-4 mm across. Bracts 2-3, leaf-like, 2-15 cm long, unequal. Heads globose, 6-8 x 4-6 mm, Sterile glumes about 2 mm long, 3-nerved on either side of the keel, mucronate, keel green, with 3-4 stout prickles. Fertile glumes as long as the sterile ones. Stamens 3, filaments less than a milimeter; anthers .5 mm long, cylindric, beaked; styles including the style branches 2 mm long. Nuts ovoid, 1 mm long.

Common in marshes and in paddy fields, associated with grasses and other sedges.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1542 Lailad, 1562 Umling(Khasi Hills).

Kyllinga nemoralis (Forst.) Dandy ex Hutch. & Dalz. Fl. W. Trop. Afr. 2: 486. 1936; Koyama in Gard. Bull. Sing. 30: 163. 1977. - - Kyllinga monocephala Rottb. Descr. Icon. Rar. Nov. Pl. 13, t. 4. f. 4,1773; Cl. in Hook.f. Fl. Brit. India 6: 588. 1893. - - Thryocephalon nemoralis Forst. Char. Gen. Pl. 130. 1776(Plate 24).

Rhizomes creeping, elongate, covered with brown scales. Culms leafy at the base, trigonous, 20-45 cm high. Leaves shorter than culms, with saw toothed margin. Bracts 3-4, leaf-like,

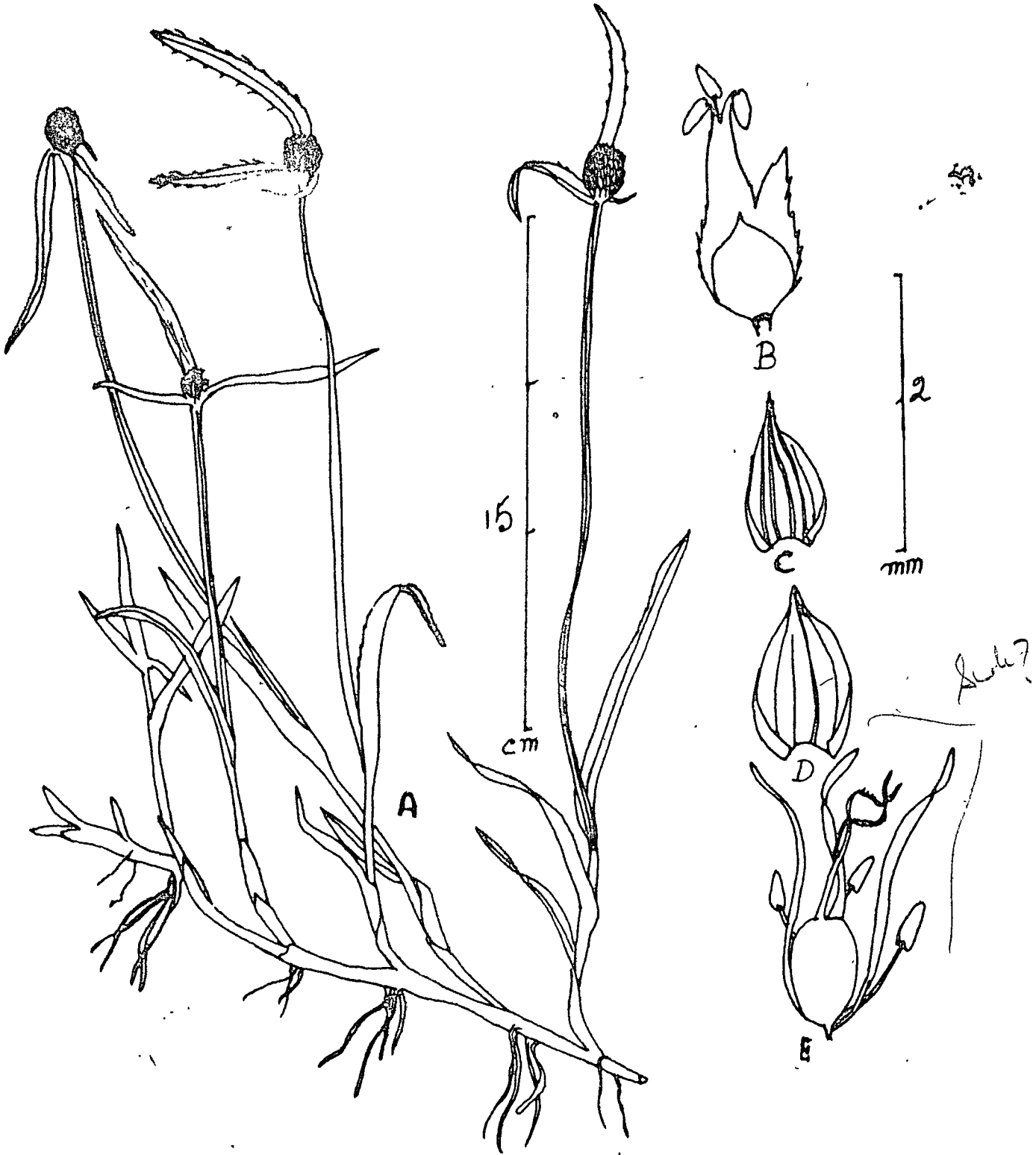

Plate 24 Kyllinga nemoralis (Forster) Dandy ex Hutch. A. Habit, B. Flower, C. Sterile Glume, D. Flowering Glume, E. Pistil with Stamens & Bristles.

acute. Spikelets condensed in a globose head. Glumes hyaline with brown ribs, winged or keeled. Keels spinous. Filaments elongate; anthers yellow, shorter than filaments; styles 2-fid, linear. Nuts ovoid or oblong, compressed with white coat and many black spots.

Common in open areas, in marshes and in ditches.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1026 Shillong; 1363 Lailad (Khasi Hills); 1269 Sohkha (Jaintia Hills).

Kyllinga triceps (Endl.) Rottb. Descr. Icon. 14, t. 4. f. 6, 1773; Cl. in Hook.f. Fl. Brit. India 6: 587. 1893; Koyama in Gard. Bull. Sing. 30: 162. 1977. - - Cyperus triceps Endl. Cat. Hort. Ac. Vindb. 1: 94. 1842; Babu Herb. Fl. Dehra Dun.561.1977.

Rhizome short. Culms 5-30 cm high, thickened at base. Leaves as long as or much shorter than culms, 3-5 mm across, acute, longitudinally striated, median nerve conspicuous, scabrid. Bracts leaf-like,3, 2-8 cm long. Spikes 1-3, central one globose, ovoid, 4-6 x 3-4 mm, sterile glume 3 mm long,cymbiform, mucronate or acute, 7-9-nerved. Keel scabrid. Fertile glumes as long as or longer than the sterile ones, keel glabrous, apex mucronate. Stamens 2, filaments strap-shaped, 1 mm long; anthers 7 mm long, subcylindric, basifixed; styles very short, 2-fid, branches coiled. Nuts 1 mm long, ovoid, truncate, apiculate, grey or turning black when mature, minutely pectinate.

Common in fields both in open and shady areas.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1706 Shillong; 1599 Jowai.

Hypolytrum Rich.

Hypolytrum nemorum (Vahl.) Spreng. Syst. Veg. 1: 233. 1824; Schoenus nemorum Vahl. Symb. Bot. 3: 8. 1794; - - Hypolytrum latifolium Rich. ex Pers. Syn. Pl. 1: 70. 1805; Cl. in Hook.f. Fl. Brit. India 6: 678. 1894.

Rhizomes short or long, woody, with thick roots. Culms jointed, tufted, 30-50 cm high, distinctly trigonous, glabrous. Leaves tufted, mostly radical, stem leaves 1 at each node, glabrous, twice longer than the stem, ensiform, flat, nerves raised up, margin toothed. Bracts longer than the umbel. Spikelets numerous, clustered, brown, 2 mm long, ovate-lanceolate or oblong. Pedicels as long as the spikelets, usually with glume-like bracteoles. Glumes 1-1.5 mm long, ovate, rounded or shallowly notched, nerveless. Filaments 6 mm long; anthers 5 mm long, cylindric. Nuts conic, longer than the glume with broad, persistent style base.

Commin in forests under tall trees.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1969 Baghmara; 3146 Way to Baghmara (Garo Hills).

Lipocarpha R. Br.

Lipocarpha chinensis (Osb.) Kern in Blumea, Suppl. 4: 167. 1958; Koyama in Hara Fl. East. Himal. 392. 1966; Babu Herb. Fl. Dehra Dun 567. 1977. - - Scirpus chinensis Osb. Dagb. Ostind.

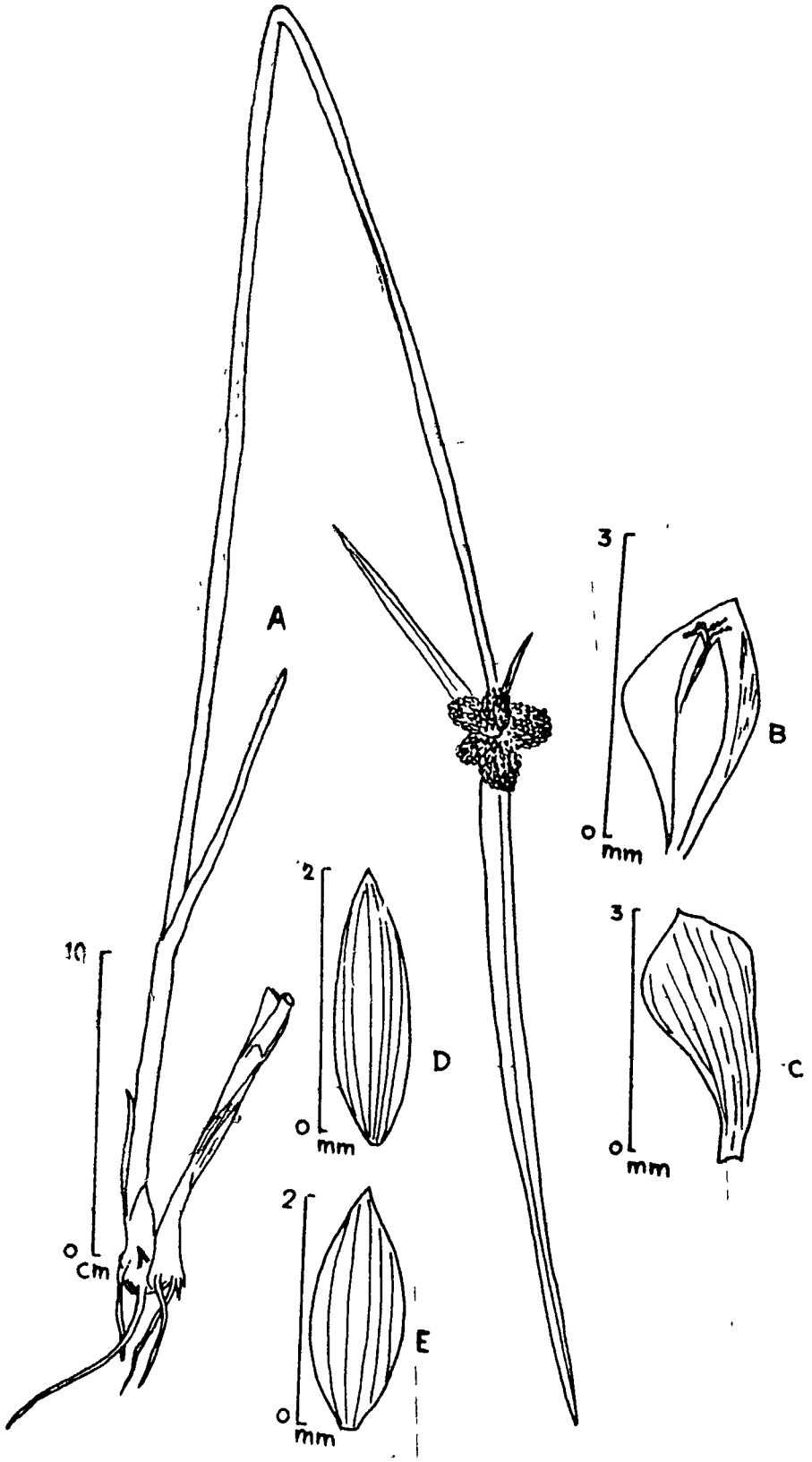

Plate 25 Lipocarpha chinensis (Osbeck.) Kern. A. Habit, B. Flower, C & D. Non-flowering Glumes, E. Flowering Glume.

Resa 220. 1757. - - Hypaelyptum argenteum Vahl. Enum. Pl. 2: 283. 1805. - - Lipocarpha argentea (Vahl.) R. Br. in Tuckey. Merr. Exp. Congo 477. 1819; Cl. im Hook.f. Fl. Brit. India 6: 667. 1893, et Ill. Cyp. t. 60. f. 4-7. 1909 (Plate 25).

Vern.-'U Dum' (K).

Roots fibrous; stems 20-40 cm high, obtusely trigonous. Leaves as long as or shorter than the stem. Bracts leaf-like, usually 3, one longer and erect. Spikes 3-5 together, globose, white, condensed at the tip of the stem into punctate heads. Spikelets spathulate, 3 mm long, base cuneate, apex subacute. Glumes spathulate, strongly 1-nerved, as long as spikelets, base narrow, expanding above, apex acute. Upper glumes lanceolate, 2 mm long, obscurely 7-nerved; flowering glumes similar to sterile glumes. Stamens 3, sometimes 1, anthers cuneate; styles 3-fid; stigmas coiled. Nut trigonous, ellipsoid or ovoid.

Common in all types of soils, both in open areas as well as in forests. A common weed of paddy field.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1012 Shillong, 1230 Cherrapunjee (Khasi Hills); 1600 Jowai (Jaintia Hills).

Mariscus Gaertn.

Perennial, rarely annual herbs. Stolons present or 0. Leaves mostly radical. Involucral bracts leaf-like. Inflorescence an umbellate panicle with long or short rays. Spikes cylindric. Rhachilla disarticulating above the two lowest empty glumes. Stamens 3. Styles short, 3-fid. Nuts trigonous.

K E Y T O S P E C I E S

1a. Spikes globose, brown or reddish brown. . . . . compactus

1b. Spikes cylindric, green.

2a. Spikes sessile, congested . . . cyperinus

2b. Spikes pedunculate . . . . . sumatrensis

Mariscus compactus (Retz.) Boldingh, Zakfl. Landb. Java. 77. 1916; Babu Herb. Fl. Dehra Dun 554. 1977; Koyama in Gard. Bull. Sing. 30: 153. 1977. - - Cyperus compactus Retz. Obs. Bot. 5: 10. 1789. - - Mariscus dilutus (Vahl.) Nees ex Wight Contrib. bot. Ind. 90. 1834. - - Cyperus dilutus Vahl. Enum. Pl. 2: 357. 1806. - - Mariscus microcephalus Prescl. Rel. Haenk. 1: 182. 1830; Cl. in Hook.f. Fl. Brit. India 6: 624. 1893.

Rhizomes short, covered with brown striate leaf sheaths. Culms 30-50 cm high, obtusely trigonous or sometimes terete. Leaves long, spongy, longer than culms, 5-8 mm broad, acute. Bracts leaf-like, acute, much longer than the umbel. Spikelets linear, terete, 4-20-flowered, reddish brown or chestnut brown. Glumes cymbiform, obtuse. Stamens 3, short, embraced by the glume, attached to the base of the nut; styles 3-fid. Nut trigonous.

Common in marshes and in paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1361 Lailad (Khasi Hills); 1420 Baghmara (Garo Hills); 1624 Dawki (Jaintia Hills).

Mariscus cyperinus (Retz.) Vahl. Enum. Pl. 2: 377. 1806; Cl. in Hook.f. Fl. Brit. India 6: 621. 1893; Koyama in Gard. Bull. Sing. 30: 157. 1977. - - Kyllinga cyperina Retz. Obs. Bot. 6: 21. 1791. - - Cyperus cyperinus (Retz.) Sur. Het. Gesl. Cyper. Mal. Archip. 154. t. 6.f. 10, 1898.

Stolon short or absent. Roots fibrous, tufted, brown. Culms 30-50 cm high, trigonous. Leaves as long as or shorter than culms, 4-5 mm across, tapering towards the apex. Bracts leaf-like. Spikes sessile, or subcapitate, 1-2 cm long, truncate. Spikelets 6 mm long, terete, acute, 2-3-flowered. Glumes ovate-lanceolate, 4 mm long, keel membranous, apex rounded. Stamens 1-3, filaments short; anthers longer than the filaments; styles short, stout, 3-fid, coiled. Nuts linear, trigonous, slightly curved.

Common in grasslands and in betel-nut plantations, in moist shady places.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1617 Sohkha (Jaintia Hills); 1704 Shillong; 1900 Mawmluh (Khasi Hills).

Plate 26 Mariscus sumatrensis (Retz.) T. Koyama, A. Habit, B. Flower, C, & D. Sterile Glumes, E & F. Flowering Glumes.

Mariscus sumatrensis (Petz.) Koyama in Gard. Bull. Sing. 30: 154. 1977. - Scirpus cyperoides Linn. Mant. Alt. 181. 1771. - Mariscus cyperoides (Roxb.) Dietrich Sp. Pl. 2: 438. 1833. - - M. sieberianus Nees ex Cl. in Hook.f. Fl. Brit. India 6: 622. 1893. - - Kyllinga sumatrensis Retz. Obs. Bot. 4: 13. 1786 (Plate 26).

Rhizomes short, covered with thin brown scales. Culms 40-60 cm high, trigonous, glabrous. Leaves 10-30 cm, linear, acute. Bracts leaf-like, 5-10, unequal. Spikes cylindric many spikelets. Spikelets lanceoalte, 3 mm long; lower glumes 8 mm long, apex linear, strongly 1-nerved, upper glumes equaling the lower ones, broad. Fertile glumes lanceolate, 3 mm long, strongly 1-nerved. Styles 3-fid. Nuts linear.

Very common in grasslands.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1003, 1705 Shillong; 1815 Pariong (Khasi Hills); 1616 Sohkha (Jaintia Hills).

Pycreus P. Beauv.

Annual or perennial marshy herbs. Rhizomes slender or 0. Culms trigonous or slightly compressed, rarely jointed. Leaves radical (or cauline in species with jointed culms). Leafy bracts long, much longer than umbels. Umbels with or without rays. Spikelets laterally compressed; glumes distichous; stamens 1-3, anthers 2-celled. Styles 2-3-fid. Nuts flat.

K E Y T O S P E C I E S

1a. Nuts transversely wrinkled.
  2a. Spikelets straw-coloured, suberect or erect . . . . . stramineus
  2b. Spikelets chestnut brown, spreading . . latispicatus
1b. Nuts not wrinkled.
  3a. Culms with nodes . . . . . sanguinolentus
  3b. Culms without nodes.
    4a. Culms 1-10 cm high; glumes glistening on nerve side; nuts obtuse, black. . . pumilus
    4b. Culms more than 10 cm high; glumes and nuts otherwise.
      5a. Inflorescence congested forming heads . . . . . nitens
      5b. Inflorescence distinctly rayed.
        6a. Lowest bracts twice longer than umbels.
          7a. Spikelets rusty brown to yellowish brown; nuts ovate . . . . . polystchyus
          7b. Spikelets brown or red; nuts oblong . . . . . angulatus
        6b. Lowest bracts more than twice as long as umbels.
          8a. Spikelets dark purplish or chestnut brown . . . . . flavidus
          8b. Spikelets pale brown or straw-coloured.
            9a. Spikelets with looser glumes, slightly compressed; nuts 1 mm long, oblong . . . flavidus var. stricta
            9b. Spikelets with closely imbricate glumes, strongly compressed; nuts 0.5 mm long, ovate. . flavidus forma khasiana

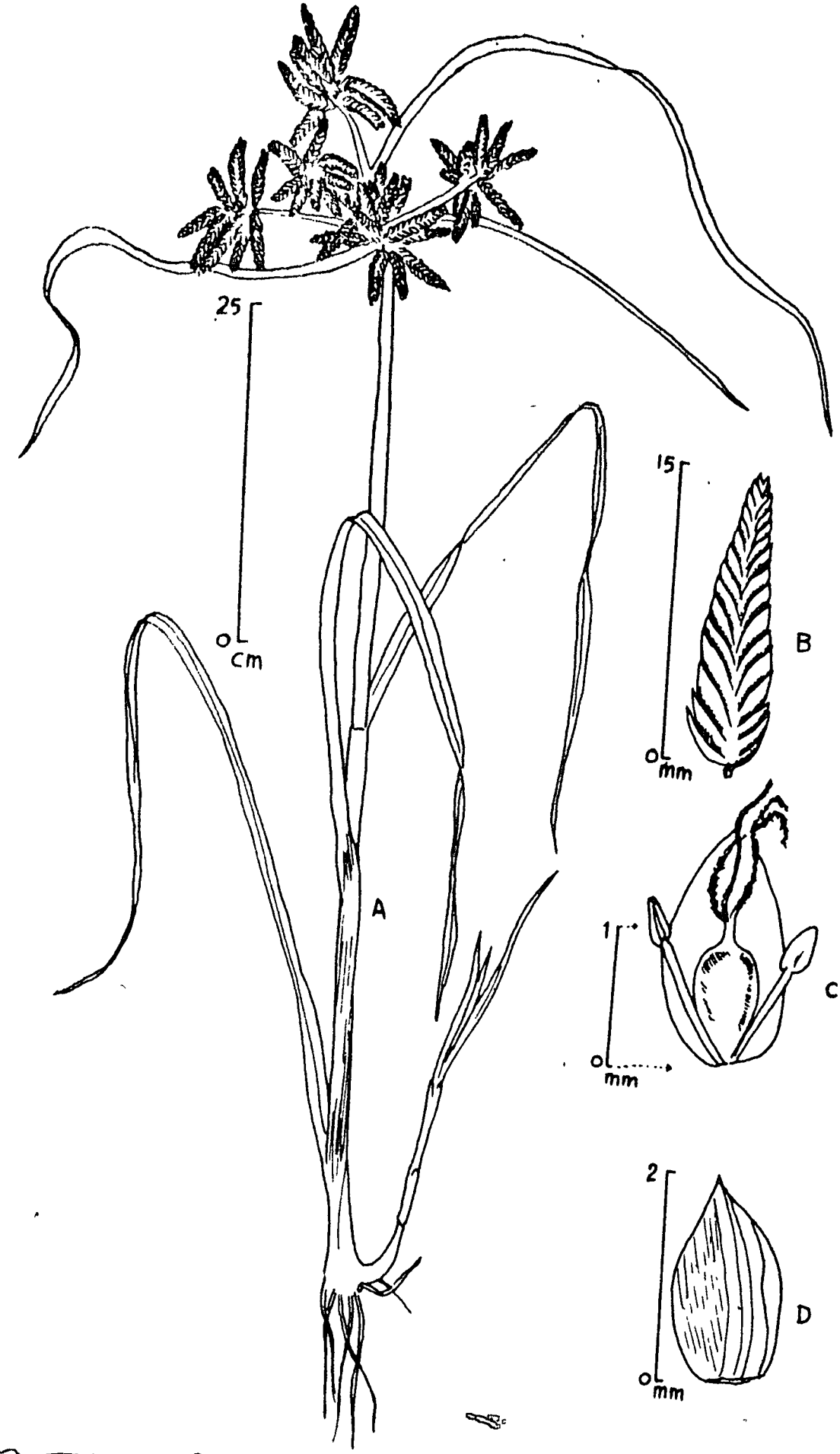

Plate 27. Pycreus flavidus (Retz.) Koyama A. Habit, B. B. Spikelet, C. Flower, D. Glume.

Pycreus angulatus Nees in Linnaea 9: 283. 1835; Cl. in Hook.f. Fl. Brit. India 6: 593. 1893.

Roots fibrous, rhizomes short. Culms 50-60 cm high, slightly compressed, trigonous, glabrous. Leaves radical, 20-30 x 0.4-0.6 cm, channelled, acute, sheaths close, glabrous. Bracts leaf-like, as long as umbels. Spikelets compressed, 1-1.5 cm long, ovate-lanceolate; glumes distichous, ovate 3-3.5 mm long, acute, with prominent median nerve, glabrous. Stamens 3, sometimes 2 reduced into strap-shaped bristles; filaments short, anthers long, 3 mm long, strap-shaped; styles filiform, 2-fid. Nuts oblong, ovoid.

Common in marshes and along water courses in association with grasses and other sedges.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 3055 Shillong; 1873 Mawmluh (Khasi Hills); 3211 Sutnga (Jaintia Hills).

Pycreus flavidus (Retz.) Koyama Journ. Jap. Bot. 51(10): 313. 1976 et in Gard. Bull. Sing. 30: 150. 1977. - - Cyperus globosus Retz. Obs. Bot. 5: 13. 1788; Vahl. Enum. Pl. 2: 334. 1806; Kern Fl. Males. ser. 1, 7(3): 648. 1974. - - C. globosus All. auct. Fl. Pedem. 49. 1789. - - Pycreus globosus (All.) Reichb. Fl. Germ. Excurs. 140. 1830. - - P. capillaris (Konig ex Roxb.) Nees ex Cl. in Hook.f. Fl. Brit. India 6: 591. 1893 (Plate 27).

Stoloniferous herbs. Culms variable, 30-80 cm high, glabrous, obtusely trigonous. Leaves radical, shorter than culms. Sheaths membranous, close. Bracts leaf-like, much longer than umbels. Spikelets clustered, 2.5 x 0.3-0.5 cm, cuneate, olive grey. Glumes 2 mm long, 3-nerved, acute; stamens 2, filaments 1 mm long; anthers minute shorter than filaments; styles stout, 3-fid, branches plumose. Nuts oblong, ovoid, apiculate.

Common in marshes, ditches and in paddy fields. One of the dominant sedges of Meghalaya and can be noticed from a distance on account of its black or olive grey spikelets.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1002 Shillong.

forma khasiana C. bohmeri ?

This taxon differs from the type species in having strongly compressed spikelets, which are pale straw-coloured and in having small glumes and nuts of 1.5 mm and 0.5 mm long, respectively.

Common in marshes and along the water channels in paddy fields.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1680 Umling (Khasi Hills).

var. stricta C. brevis

This variety differs from the above [illegible] taxon forma khasiana in having looser glumes, truncate spikelets, pale chestnut brown and nuts with rough surface.

Common in paddy fields and in marshes.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1109 Shillong.

Pycreus latispicatus Cl. in Hook.f. Fl. Brit. India 6: 590. 1893.

Rhizomes slender. Culms 15-30 cm high, subterete, striate. Leaves as long as or very much shorter than culms, 1-3 mm broad, glabrous, longitudinally striate, median nerve more parominent, margin scabrid. Bracts leaf-like, 3, 5-20 cm long. Inflorescence reduced to a single head, sometimes rayed. Spikelets 0.5-1.5 cm long, chestnut brown. Glumes 2 mm long, ovate, cymbiform, truncate, chestnut brown, 3-nerved; margin hyaline; stamens 2; filaments long, strap-shaped, 2 mm long; anthers short 0.5 mm long; styles 2-fid. Nuts 1 mm long, ovate, black with close, punctate, longitudinal cells, base stout.

Common in marshes and in paddy fields.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1113 Shillong.

Pycreus nitens Nees in Linnaea 9: 283. 1835; Cl. in Hook. f. Fl. Brit. India 6: 591. 1893.

Culms 5-20 cm high, trigonous at least below the umbels, striate. Leaves as long as culms, broad, glabrous, margin scabrid towards the apex. Bracts leaf-like, 3-5, unequal. Spikelets many, clustered, 4-8 mm long, compressed. Glumes imbricate, 1 mm long, keel strongly compressed, margin hyaline, apex mucronate. Stamens 1; filaments very short; anthers less than half a milimeter,

yellow; styles very short, 2-fid. Nuts 0.5 mm long, ovoid, black with many punctate transverse cells.

Common marshes and in paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1917 Agarobadha (Garo Hills).

Pycreus polystachyus (Rottb.) P. Beauv. Fl. Owar. 2: 48. t. 86. f. 2, 1807; Cl. in Hook.f. Fl. Brit. India 6: 592. 1893; Koyama in Gard. Bull. Sing. 30: 149. 1977. - - Cyperus polystachyus Rottb. Descr. Icon. Rar. Nov. Pl. Ill. 39, t. 11. f. 1, 1773.

Roots fibrous, tufted. Culms 10-40 cm high, trigonous. Leaves as long as or shorter than culms, 2-4 mm across, shortly scabrid on the margin. Bracts leaf-like, 5-15 cm long. Umbels compound, sometimes reduced to a single head; rays 1-6. Spikelets 0.5-2 x 0.4-0.5 cm, deciduous. Glumes 2.5 mm long, ovate-lanceolate, apex rounded or subacute, pale straw-coloured. Stamens 2; filaments short, less than half a milimeter, stout; anthers 1 mm long, triquetrous, subterete, obtuse; styles 2-fid, branches longer than styles. Nuts ovoid, ovate, striate, 1 mm long, beaked.

Common in marshes associated with grasses and other sedges.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1873 Mawmluh (Khasi Hills); 3211 Sutnga (Jaintia Hills).

Pycreus pumilus (Linn.) Nees ex Cl. in Hook.f. Fl. Brit. India 6: 591. 1893; Koyama in Gard. Bull. Sing. 30: 151. 1977. - Cyperus pumilus Linn. Cent. Pl. 2: 6. 1756; Babu Herb. Fl. Dehra Dun 559. 1977.

Roots fibrous. Culms 3-8 cm high, trigonous. Leaves as long as culms, scabrid on margins. Bracts leaf-like, unequal, 2-6 cm long. Spikelets 5-8 mm long, compressed. Glumes distichously imbricate, 1 mm long, apex rounded with a stout mucro at the apex, hyaline with brown streaks in the centre. Stamens 1, very short; anthers 2-celled; styles 2-fid. Nuts 0.5 mm long, ovoid, truncate, compressed, rough.

Common in paddy fields along channels, associated with grasses.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1917 Agarobadha (Garo Hills).

Pycreus sanguinolentus (Vahl.) Nees in Linnaea 9: 283. 1835; Cl. in Hook.f. Fl. Brit. India 6: 590. 1893; Koyama in Gard. Bull. Sing. 30: 147. 1977. - - Cyperus sanguinolentus Vahl. Enum. Pl. 2: 351. 1805; Babu Herb. Fl. Dehra Dun 560. 1977.

Culms erect or spreading, 30-40 cm high, glabrous. Leaves shorter than culms, obtuse, scabrid. Bracts leaf-like. Inflorescence digitate or condensed into a congested head, brownish black or yellow; spikelets oblong, 0.5-2 cm long, 3-4 mm across, compressed, many flowers, deciduous. Glumes 1.5-2 mm long, ovate, margin brown, 5-nerved, obtuse. Stamens 3; filaments about 1 mm

long; anthers shorter than filaments, nearly straight, yellow; styles 2-fid, about 1 mm long. Nuts ovoid, suboblong, shorter than style, truncate.

Common in paddy fields, in marshes and along the banks of water courses.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1685 Umling; 1721 Burnihat (Khasi Hills).

Pycreus stramineus (Nees) Cl. in Hook.f. Fl. Brit. India 6: 589. 1893; Koyama in Card. Bull. Sing. 30: 147. 1977. - - Cyperus stramineus Nees in Wight Contrib. bot. Ind. 74. 1834.

Roots tufted, capillary. Culms 30 cm high, trigonous. Leaves up to 25 cm long, glabrous, tip pointe with 2-teeth-like, on each side near the apex. Bracts leaf-like, longer than the head. Spikelets few, straw coloured, about 1 x 0.2 cm , compressed. Glumes closely imbricate, 1.5 mm long, deltoid with a short mucro at the apex, 3-nerved. Stamens 2; filaments less than half a milimeter; styles 2-fid. Nuts about 1 mm long, ovoid, oblong with obscure(?) transverse cells.

Weed of paddy fields .

Fls. & Frts.: August to January.

Specimens examined: Myrthong 1974 Baghmara (Garo Hills).

Rhynchospora Vahl.

Short or tall perennial sedges. Culms simple, leafy all over or not. Inflorescence capitate or spreading. Bracts leaf-like. Glumes many; lower distichous and upper spirally imbricate. Basal and uppermost glumes sterile. Hypogynous bristles 6 or 0, scabrid. Stamens 1-3; styles slender, 2-fid; style base conical, persistent. Nuts biconvex, ovoid, smooth or transversely wrinkled, beaked by the persistent style base.

K E Y T O S P E C I E S

1a. Inflorescence capitate, terminal. . . . wallichiana
1b. Inflorescence of spreading corymbs or panicles.
  2a. Culms slender, 50-100 cm high; leaves setaceous; inflorescence paniculate . . . griffithii
  2b. Culms stout, 30-50 cm high; leaves broad; inflorescence corymbose . . . . aurea

Rhynchospora aurea Vahl (Tritton) Enum. Pl. 2: 229. 1805; Cl. in Hook.f. Fl. Brit. India 6: 670. 1893. - - R. corymbosa (Linn.) Britton in Trans. New York Acad. Sci. 11: 84. 1892. - - Scirpus corymbosus Linn. in Torner Cent. Pl. 2: 7. 1756.

Culms obtusely trigonous, robust about 50 x 0.5 cm. Leaves as long as culms, serrate. Panicle 4-5 cm across, brown. Lower glumes short, mucronate; other glumes 5 mm long, acute. Bristles 6, as long as or longer than nuts, brown. Stamens 6; filaments as long as glumes; style conic, persistent. Nuts cylindric, glabrous, truncate with conic style base.

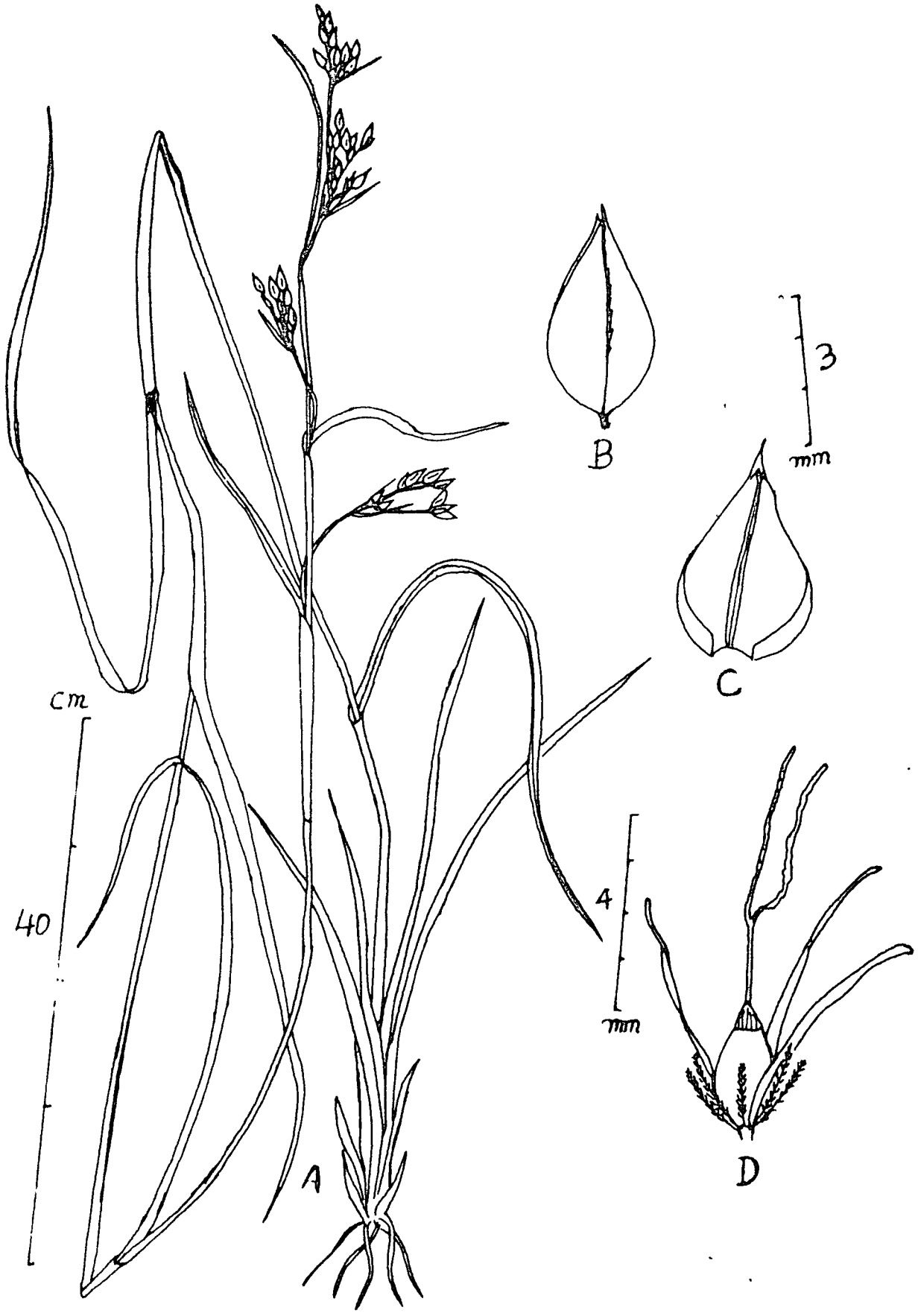

Plate 28. Rhynchospora griffithii Boeck. A.Habit, B.Glume (dorsal view) C.Glume (ventral view) D.Nut with style & bristles.

Common in marshes, on black soils and along the banks of rivers, streams, etc. and also in abandoned paddy fields.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1423 Baghmara (Garo Hills); 1671 Umling (Khasi Hills).

Rhynchospora griffithii Boeck. in Linnaea 38: 404. 1874; Cl. in Hook.f. Fl. Brit. India 6: 672. 1893 (Plate 28).

Rhizomes short, scaly. Culms 50-100 cm high, obtusely trigonous. Leaves shorter than culms, channelled, scabrid. Panicle compound. Spikelets 3 mm long. Glumes as long as spikelets, cymbiform, acute or hispid. Stamens 2; anthers yellow, strap-shaped. Bristles 6, Styles 2-fid, branches linear, brown. Nuts slightly compressed, wrinkled, rounded at apex with short beak.

Common in grasslands and in shrubby places.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1237 Cherrapunjee; 1506 Umsning, 1714 Shillong (Khasi Hills); 3161 Garumpani (Jaintia Hills).

Rhynchospora wallichiana Kunth/ Enum. 2: 289. 1837; Cl. in Hook.f.Fl. Brit. India 6: 668. 1893.

Culms slender, 20-60 cm high, trigonous. Leaves shorter than culms, glabrous or hairy, sharp pointed. Bracts leaf-like. Spikes capitate. Flowering glumes 5 mm long. Stamens with yellow anthers; styles 2-fid. Nuts ovoid.

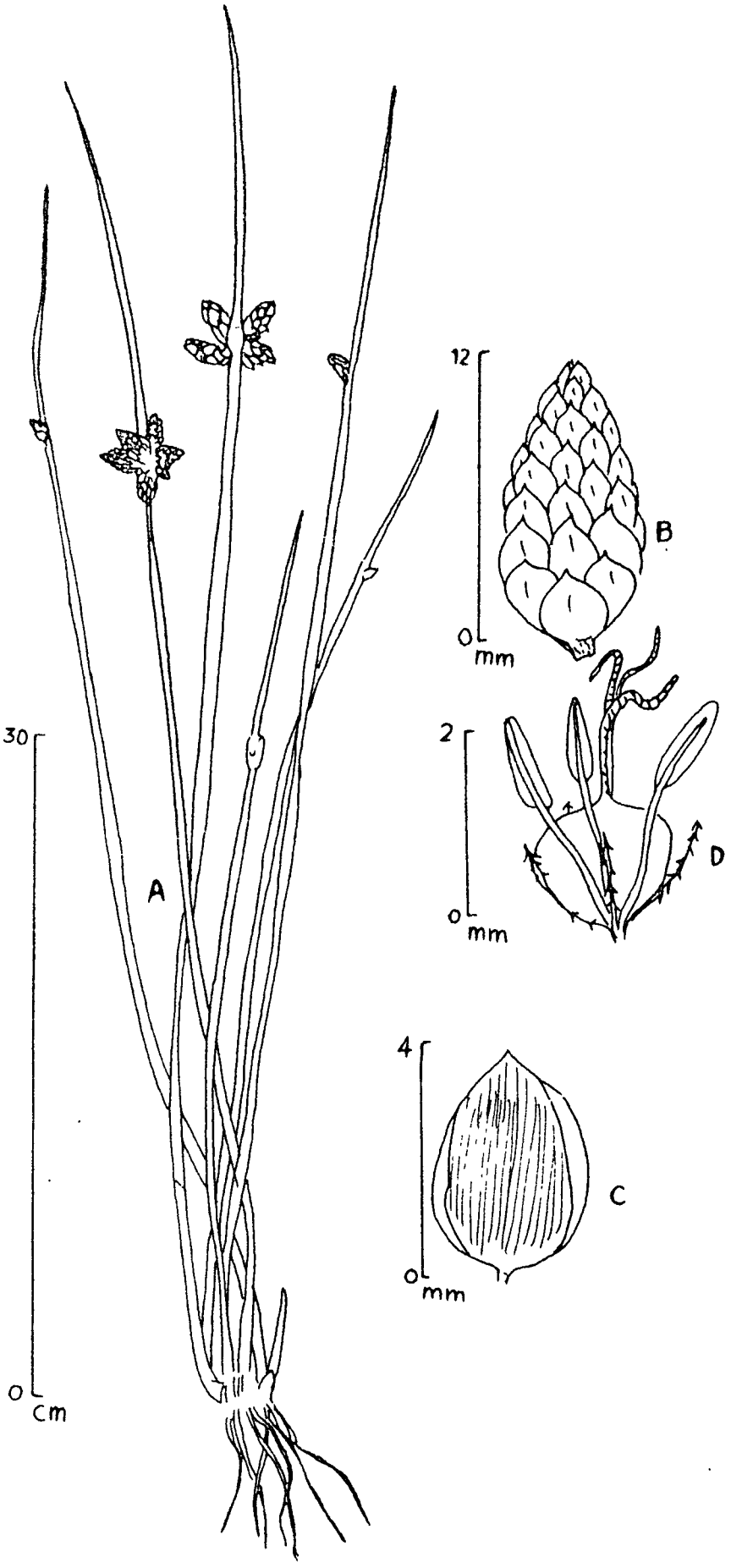

Plate 29 Schoenoplectus juncoides (Roxb.) Palla A. Habit, B. Spikelet, C. Glume, D. Nut with style at the apex and stamens with bristles at the base.

Common in grasslands and in open situations.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1094 Barapani; 1302 Pongtung (Khasi Hills); 3219 Sutnga, 3164 Garumpani (Jaintia Hills).

Schoenoplectus

Perennial or annual sedges. Rhizomes thick. Culms slender terete or strongly trigonous. Leaves reduced to sheaths. Bracts culm-like, acute. Spikelets 1-9 together, cuneate. Glumes spirally arranged and closely imbricate. Bristles 6-7, spinous. Stamens 1-3, anthers sagittate or cuneate. Styles 3-fid rarely 2-fid, style base persistent, conic. Nuts glabrous or striate.

K E Y T O S P E C I E S

1a. Culms terete, 1-2 mm across. . . . juncoides
1b. Culms strongly trigonous, 1-2 cm across. . . . . mucronatus

Schoenoplectus juncoides (Roxb.) Palla bot. Jahrb. Syst. 10: 299. 1888. - - Scirpus juncoides Roxb. Fl. Ind. 1: 218. 1820; Koyama in Hara Fl. East. Himal. 392. 1966; Babu Herb. Fl. Dehra Dun 568. 1977. - - S. erectus auct. non Poir. Cl. in Hook.f. Fl. Brit. India 6: 656. 1893 (Plate 29).

Roots fibrous. Culms 30-50 cm high, tufted, terete, apex acute. Leaves reduced to sheaths. Spikelets, 1-7, in a single lateral head, cylindric or globose, acute, many flowered. Glumes 4 mm long, ovate, with membranous margin, base rounded, truncate at the apex. Bristles 6, as long as nuts, brown with retrorsely

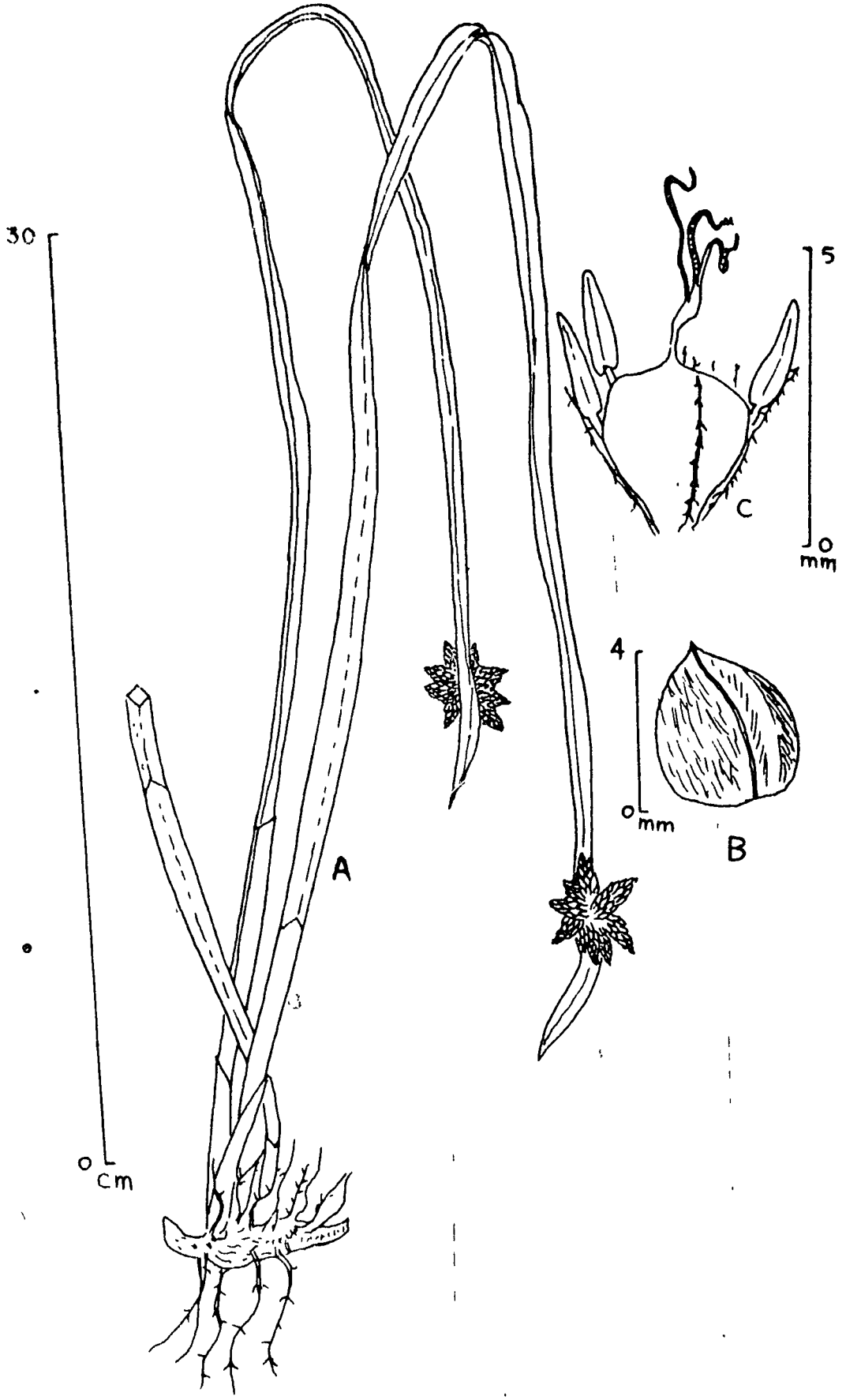

Plate 30 Schoenoplectus mucronatus (Linn.) Palla A. Habit, B. Glume, C. Nut with Style, Stamen and Bristles.

pointed spines; stamens 3; filaments long; anthers stout, cuneate; styles stout, 3-fid, slightly coiled. Nuts convex, truncate with inconspicuous undulation.

Common in marshes and in paddy fields as weeds.

Fls. & Frts. : May to January.

Specimens examined: Myrthong 1018 Shillong, 1077 Barapani; 1249 Mawmluh; 1829 Markasa (Khasi Hills); 1406 Baghmara (Garo Hills); 1572 Jowai (Jaintia Hills).

Schoenoplectus mucronatus (Linn.) Palla Verh. K.K. Zool. bot. Ges. Wien. 38, sitzb. 49. 1888. - - Scirpus mucronatus Linn. Sp. Pl. 50. 1753; Babu Herb. Fl. Dehra Dun 569. 1977 (Plate 30).

Rhizomes stout, prostrate. Culms tufted, 60-100 cm high, ending in lateral spikes, strongly trigonous. Leaves reduced to sheaths at the base. Spikelets 5-9, together, in a single lateral head, bracts short, cuneate. Glumes 4 mm long, subovate, acute. Bristles 7, spinous, as long as nuts. Stamens 3; filaments stout; anthers stout, sagittate, basifixed; styles 3-fid, slightly curved. Nuts expanded at the apex, brown, shining.

Common in marshes and swamps forming a dense vegetation.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1178 Shillong; 1246 Mawmluh; 1700 Mawsmai; 1796 Pariong (Khasi Hills); 1611 Jarain (Jaintia Hills).

Scirpus Linn.

Usually aquatic plants. Culms terete or trigonous. Inflorescence compound panicles or reduced to 0 solitary spikelets. Spikelets ovoid, many flowered. Glumes spirally imbricate. Hypogynous bristles 2-7 or 0. Stamens 1-3; anthers linear, oblong, crested or not. Ovary ovoid; styles slender 2-3-fid. Nuts obovoid, trigonous or plano-convex.

K E Y T O S P E C I E S

1a. Small immersed or submerged plants; spikelets solitary; hypogynous bristles 0; styles 2-fid . . . . . fluitans

1b. Large emergent plants; spikelets numerous; hypogynous bristles present; styles 3-fid. . . . . eriophorum

Scirpus eriophorum Mich. Fl. Bor. Am. 1: 93. 1865 ; Cl. in Hook.f. Fl. Brit. India 6: 661. 1893.

Vern. - ' Jalyeit ' (K).

Rhizomes stout. Culms tufted, erect, 60-150 cm high, shining, trigonous. Leaves 40-70 x 0.6-1.5 cm, margin very scabrid. Bracts leaf-like. Panicles pendulous. Spikelets numerous, in clusters, globose, 4-5 x 3-4 mm, many flowered. Glumes 2 mm long, ovate-lanceolate, 1-nerved, acute. Bristles 6-7, slender, brown, thickened near the apex, papillose, glabrous. Stamens with pendulous yellow anthers; styles filiform, short, 3-fid. Nuts trigonous, oblong, beaked.

Common in marshes and along the banks of streams, rivers, etc. The sharply serrated or scabrid margin of leaves and bracts can cut the fingers while collecting.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1079 Shillong.

Scirpus fluitans Linn. Sp. Pl. 71. 1753; Cl. in Hook.f. Fl. Brit. India 6: 653. 1893.

Rhizomes stout, with tufts of fibrous roots. Culms very weak, branched, leafy above, terete, 20-40 cm long. Leaves as long as culms, strap-shaped, 3-nerved, glabrous. Sheaths hyaline. Spikelets solitary at the apex of the long peduncle, oblong-lanceolate, 4-5 mm long, green or pale green. Glumes 2 mm long, ovate-lanceolate, green, cymbiform, many nerved. Bristles 0. Styles 2-fid, about 1 mm long, style base thickened. Nuts 1 mm long, oblong, convex, smooth.

Submerged in ponds. The stamens at maturity look like bristles.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1762 Nongkrem; 3084 Umkrem (Khasi Hills).

Scleria Berg.

Perennial or annual, erect leafy herbs. Culms trigonous. Leaves sheathing at the base. Bracts leaf-like. Bracteoles setaceous. Inflorescence terminal or axillary panicles. Flowers unisexual rarely bisexual, in androgynous spikelets usually with

1 female flower at the base and several males above. In male spikelets, glumes numerous; stamens 1-3; pistillode sometimes present. In female spikelets glumes 6; styles 3-fid. Nuts with gynophore-like stalks at the base, osseous, shining.

K E Y T O S P E C I E S

1a. Culms 3-15 cm high, prostrate or suberect; nuts flutted longitudinally . . . . . caricina

1b. Culms 0.5-2 m high, erect or straggling; nuts otherwise.

2a. Panicles spreading with numerous spikelets; nuts glabrous . . . . terrestris

2b. Panicles otherwise with fewer spikelets; nuts hairy or glabrous.

3a. Nuts hairy.

4a. Nuts convered with conical, tubercle based hairs at the top; plants very hairy. . . . khasiana

4b. Nuts covered with ferruginous hairs on the raised portions; plants glabrous. . . . . parvula

3b. Nuts glabrous, if hairy, hairs neither ferruginous nor conical.

5a. Lobes of disc margin lanceolate, acute or subulate . . . . . biflora

5b. Lobes of disc margin ovate . . . levis

Scleria biflora Roxb. Fl. Ind. 3: 573. 1832; Cl. in Hook. f. Fl. Brit. India 6: 687. 1893.

Roots fibrous, deep brown. Culms 30-50 cm high, trigonous, glabrous. Leaves 15-30 cm long, glabrous, subacute, 3-nerved. Sheaths loose, truncate. Panicles branched. Bracteoles filiform. Spikelets 4 mm long. Glumes 3, acuminate; margin brown. Stamens 3; filaments short; anthers long; styles 3-fid, scabrous. Nuts globose, white, tesselate, with distinct ridges and furrows.

Common in wet places, specially in partially shaded areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1055 Shillong; 1115 Upper Shillong.

Scleria caricina (R. Br.) Benth. Fl. Austr. 7: 426. 1878; Cl. in Hook.f. Fl. Brit. India 6: 688. 1893; Kern in Blumea 11: 208. 1911; Babu Herb. Fl. Dehra Dun 571. 1977. - - Displocrum caricinum R. Br. Prodr. 241. 1810.

Roots deep brown or red, fibrous. Culms decumbent, 5-15 cm high, trigonous, shortly jointed. Leaves 2-4 x 0.4-0.5 cm, lanceolate, striate, glabrous, acuminate. Sheaths with obliquely truncate mouth, glabrous. Bracts shorter than leaves, narrower, subulate, lanceolate, acute. Inflorescence clustered at the axils of leafy bracts; bracteoles glumaceous, cymbiform. Spikelets sessile at the axils or on short peduncle, 0.5-4 cm long. Female spikelets 2 mm long, with 1-2 males on either side.

Fertile glumes opposite, about 1 mm long, ovate, acute, 5-7-nerved; male glumes same as in females, but smaller and more acute; stamen 1. Styles very short, 3-fid. Nuts 1 mm long, subovoid, many nerved or with longitudinal striations all over.

Rare. Occurs in wet places under grasses.

Fls. & Frts.: October.

Specimens examined: Myrthong 3162 Garumpani (Jaintia Hills).

Scleria khasiana Cl. in Hook.f. Fl. Brit. India 6: 692. 1893.

Rhizomes condensed, short, woody with brown scales. Culms 0.5-1 m high, sharply trigonous, Leaves 30 x 0.6 cm, densely hairy, very scabrid. Sheaths winged, hairy. Panicles 10-15 cm long. Bracts leaf-like; bracteoles as long as the secondary branches or longer , setaceous. Spikelets few. Male flowers 3 mm long, linear-lanceolate, acute; stamens 3. Female flowers 5-8 mm long, with 1-2 males adpressed to its base; first 3 glumes empty, shorter than half the length of spikelets. Flowering glumes 4 mm long, ovate, cymbiform, acute, nerveless; keels slightly scabrid; styles 3-fid, branches tapering towards the apex, hairy. Nuts elliptic, trigonous with stout style base, obscurely tessellate, with few tubercle based hairs at the top.

Occasional.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2908 Tasak (Garo Hills).

Scleria levis Retz. Obs. Bot. 4: 13. 1786; Cl. in Hook.f. Fl. Brit. India 6: 694. 1893; Kern in Blumea 11: 164. 1964; Koyama in Hara Fl. East. Himal. 393. 1966; Babu Herb. Fl. Dehra Dun 571. 1977.

Tufted, perennial sedges. Rhizomes prostrate. Culms erect, trigonous 1-2 m high, sometimes straggling. Leaves linear, scabrid on the margin, shorter than culms. Ligule short, indistinct. Sheaths trigonous with a truncate mouth, winged and scabrid on the keels. Inflorescence terminal with erect branches; rhachis trigonous, scabrid on the margin Bracts leaf-like; bracteoles setaceous. Spikelets clustered. Male spikelets linear-lanceolate, glumes about 3-4 mm long, acute; stamens 3; anthers longer than filaments with beaked appendage. Female glumes ovate-lanceolate, 4-5 mm long, acuminate, 1-nerved; styles 3-fid. Nuts globose, obscurely trigonous, finely reticulate or smooth.

Common in grasslands as well as in scrub jungles in marshy places.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 2064, 1773 Shillong; 1832 Markasa (Khasi Hills).

Scleria parvula Steud. Syn. 2: 174. 1855; Kern in Blumea 11: 202. 1961; Babu Herb. Fl. Dehra Dun 572. 1977.

Roots fibrous, brownish red. Culms tufted, trigonous, 30-50 cm high. Leaves scabrid , acuminate. Bracts leaf-like; bracteoles filiform. Panicles small with lower ones distant. Glumes 3-4 mm long, ovate, sharply acuminate, margin hyaline, 1-nerved.

Plate 3/ Scleria terrestris (Linn.) Foss. A.Habit, B. Female Spikelet, C. C, D&E. Female Glumes, F. Nut.

Stamens 3; filaments short; anthers longer than filaments, yellow Styles 3-fid, rough. Nuts elliptic, tessellate, shining and dotted, raised portions with feruginous ring of hairs.

Common both in open and shaded areas.

Fls. & Frts. : August to November.

Specimens examined: Myrthong

Scleria terrestris (Linn.) Fassett Rhodora 26: 159. 1924; Kern in Blumea 11: 170. 1961; Babu Herb. Fl. Dehra Dun 572. 1977. - - Zizania terrestris Linn. Sp. Pl. 991. 1753. - - Scleria elata Thw. Enum. 353. 1864; Cl. in Hook.f. Fl. Brit. India 6: 690.1893. 1893 (Plate 31).

Culms 1-1.2 m high, trigonous, winged. Leaves 40-60 x 0.5-1 cm, margin serrate. Primary bracts leaf-like and bracteoles filiform, scabrid. Panicles lax; spikelets globose; glumes about 1 mm long, finely acuminate, base rounded, strongly 1-nerved; upper glumes 4 mm long, obliquely ovate, acute, base rounded; flowering glumes as long as upper ones; sterile glume, ovate, apex retuse, faintly 3-nerved. Stamens with long filaments and exserted anthers; styles 3-fid. Nuts globose, white, reticulate, hairy on ridges and turning glabrous at maturity.

Common in forests associated with ferns and tall grasses.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1161 Shillong.

Poaceae

Barnhart, Bull. Torr. Cl. 22: 7. 1925 (Gramineae nom.alt.)

Annual or perennial herbs, rarely shrubs or trees. Stems mostly prostrate or creeping; culms cylindric, rarely flattened, jointed, usually hollow in the internodes and close at the nodes. Leaves linear-lanceolate, flat or narrow with close or open sheaths and a membranous or a ciliate ring in between the blade and the sheaths, called ligule. Ligule rarely absent. Inflorescence terminal of variously arranged spikelets, paniculate, racemose, capitate or spicate. Spikelets consisting of an axis called rhachilla and 3 or more alternate distichous bracts or glumes of which the lowest two empty, and the rest bearing in their axils flowers, subtended by the 2-keeled or nerved dorsal scales called palea. Flowers hermaphrodite or unisexual, consisting of 2 hyaline fleshy scales called lodicules representing a perianth, and of stamens or a pistil or both. In bisexual flowers stamens usually 3, hypogynous; filaments slender, usually free; anthers versatile, 2-celled; ovary entire, 1-celled; ovule erect, anatropous; styles 2, (rarely 3 or 1) free or connate at base usually exserted from the apex or side of the spikelet; stigmatic branches plumose. Fruit a caryopsis. Seeds erect, albumen copious, floury.

K E Y T O G E N E R A

1a. Spikelets 1-many-flowered, breaking up at maturity above the glumes, or if falling entire, then not 2-flowered, with the lower floret male or barren and the upper hermaphrodite.

2a. Shrubs or trees, often arborescent; leaves with petiole-like base.

3a. Culms less than 1 cm across, 2-3 m high; leaves tessellate; ultimate branches of inflorescence without bracts at base. . . Chimonobambusa

3b. Culms more than 1 cm across, 5-30 m high; leaves not tessellate; branches of inflorescence with distinct bracts at base.

4a. Inflorescence a terminal capitate spike on leafy branches; spikelets with a central hermaphrodite floret. . . . . Cephalostachyum

4b. Inflorescence an interrupted globose nodal spike or a loose panicle on leafless or leafy branches.

5a. Pericarps thin, adnate to the grains, adhering to the hilum only . . . . Bambusa

5b. Pericarps crustaceous or fleshy, separable from the grains.

6a. Paleas 2-keeled; spikelets in globose nodal spikes . . . . . Dendrocalamus

6b. Paleas not keeled; spikelets, in loose panicles . . . . . Melocanna

2b. Annual or perennial herbs; leaves sessile.

7a. Spikelets usually pedicelled, in open or contracted spike-like panicles.

8a. Spikelets usually with 2 or more fertile florets; if with 1 fertile floret, then sterile floret above it.

9a. Lemmas and rhachilla glabrous or hairy; if hairy then hairs not enveloping the lemma or if so then lemma bearing a geniculate awn; low or moderately tall grasses.

10a. Glumes shorter than lowest floret, rarely longer with margin similar to the lemma.

11a. Lemmas 5-many-nerved.

12a. Leaf-blades broad, many-nerved with transverse veins.

13a. Spikelets 2-several flowered . . Centotheca

13b. Spikelets with 1 fertile floret only . . . . . Lophatherum

12b. Leaf-blades linear, convolute or involute without transverse veins.

14a. Inflorescence a simple terminal spike or raceme.

15a. Spikelets terete, susually fragile . . . . . Brachypodium

15b. Spikelets compressed, persistent. . . . . Lolium

14b. Inflorescence a panicle.

16a. Panicles spreading; glumes and lemmas muticous, subequal.... Poa

16b. Panicles otherwise; glumes and lemmas caudate, aristate or awned.

17a. Spikelets in dense clusters of pyramidal panicles . . . Dactylis

17b. Spikelets loose.

18a. Spikelets laterally compressed; glumes tightly imbricate; lemmas keeled; ovary hairy at the top. . . . . Bromus

18b. Spikelets slightly compressed; glumes loosely imbricate; lemmas keeled above only; ovary glabrous.. ..... Festuca

11b. Lemmas 1-3-nerved.

19a. Spikelets in dense globose clusters; lemmas awned from the tip. . . Elytrophorus

19b. Spikelets otherwise; lemmas awnless or if awned, not from the tip.

20a. Lemmas entire or minutely lobed at the apex, awnless.

21a. Spikelets many-flowered, laterally compressed.

22a. Spikelets in loose or contracted panicles . . . . . Eragrostis

22b. Spikelets secund, on solitary terminal spikes . . . . . Eragrostiella

21b. Spikelets 1-few-flowered, not laterally compressed.

23a. Spikes digitate, grains with free pericarp.

24a. Axis terminating in a spikelet... ..... Eleusine

24b. Axis terminating in a mucro . . . . . Dactyloctenium

23b. Spikes not digitate; grains with adnate pericarp.. . . . Leptochloa

20b. Lemmas deeply lobed at the tip, usually awned.

25a. Spikelets in solitary spikes . . Tripogon

25b. Spikelets in panicles . . . . Neyraudia

10b. Glumes as long as or longer than the lowest floret, margin shining.

26a. Awn placed far below the tip; ovary hairy.

27a. Spikelets nodding; glumes 7-9-nerved . . Avena

27b. Spikelets upright; glumes 1-5-nerved. . . . . Helictotrichon

26b. Awn placed near the tip; ovary glabrous. . . . . Holcus

9b. Lemmas and rhachilla joints bearing long silky hairs which envelop the lemma; lemmas awnless or with a straight awn from the tip, often thin; tall grasses with usually large plume-like panicle.

28a. Lemmas glabrous; rhachilla bearded. . . . Phragmites

28b. Lemmas with silky hairs on the back.... Arundo

29b. Spikelets with 1 fertile floret, with or without 1 or 2 male or barren florets below it.

29a. Glumes very minute or suppressed; paleas 3-9-nerved; stamens usually 6; leaf-blades not transversely veined.

30a. Florets 3, the two lower sterile and reduced to lemmas; fertile lemma coriaceous. . . Oryza

30b. Floret 1; fertile lemma chartaceous. . . Leersia

29b. Glumes well developed, at least the upper, rarely minute or suppressed.

31a. Spikelets with 3 florets, the lower 2 male or barren and the terminal hermaphrodite.

32a. Spikelets subterete. . . . . Anthoxanthum

32b. Spikelets more or less flattened.

33a. Lower lemmas scale-like . . . . . Phalaris

33b. Lower lemmas well developed . . . Hierochloe

31b. Spikelets with 1 or 2 florets.

34a. Spikelets with 2 florets, the lower male or barren the upper hermaphrodite.

35a. Lower florets barren and without a palea; glumes up to half the length of the spikelets; rhachilla produced beyond the upper floret; spikelets disarticulating with part of the pedicel attached. . . Thysanolaena

35b. Lower florets male or barren, usually with a palea; upper glume as long as the spikelet; rhachilla disarticulating below the upper floret and not produced beyond it.

36a. Lemma of the upper floret glabrous or scaberulous, minutely 2-lobed . . . Arundinella

36b. Lemma of the upper floret hairy on the dorsal surface, deeply lobed..... Jansenella

34b. Spikelets with 1 floret.

37a. Lemmas usually 3-5-nerved, frequently awned; glumes firmer and longer than the hyaline lemma, or if shorter than the lemma, then herbaceous, membranous and dull; grain usually with adhering pericarp.

38a. Leaf-blades broad, ovate, cordate; spikelets disarticulating below the glumes. . . .. Sphaerocaryum

38b. Leaf-blades narrow, linear, flat, folded or rolled; spikelets disarticulating below or above the glumes.

39a. Spikelets disarticulating above the glumes, the latter persistent.

40a. Glumes equal or nearly so, longer than the lemma; lemma awned from the back or awnless.

41a. Lemmas glabrous or only with a few short hairs at the base; callus glabrous.

42a. Rhachilla produced, pectinate-ciliate . . . . . Deyeuxia

42b. Rhachilla not produced . . Agrostis

41b. Lemmas hairy or glabrous; callus-bearded. . . . . Calamagrostis

40b. Glumes unequal or nearly so, as long as the lemma or shorter; lemma awned from the tip . . . . . Muehlenbergia

39b. Spikelets disarticulating below the glumes and falling entire.

43a. Inflorescence a spike-like panicle . . . . . Alopecurus

43b. Inflorescence a loose or contracted panicle . . . . . Garnotia

37b. Lemmas 1-3-nerved, awnless; glumes and lemmas similar, hyaline or thinly membranous, shining; grain with a free pericarp. . .Sporobolus

7b. Spikelets sessile, or shortly pedicelled, along one side of the rhachis of solitary, digitate or scattered

spikes or spike-like racemes.

44a. Spikelets on opposite sides of the rhachis of solitary spike.

45a. Spikelets solitary, 2 or more-flowered. . Triticum

45b. Spikelets ir threes, 1-flowered. . . . Hordeum

44b. Spikelets in one or two rows on one side of the usually continuous rhachis of digitate or solitary spikes.

46a. Spikes digitate. . . . . Cynodon

46b. Spikes solitary. . . . . Microchloa

1b. Spikelets 2-flowered, falling entire at maturity, usually with the upper floret fertile and the lower male or barren and in the latter case often reduced to an empty lemma, all alike or different in size, shape, and structure, frequently dorsally compressed.

47a. Spikelets all hermaphrodite, with male or barren or hermaphrodite mixed in the same inflorescence.

48a. Spikelets solitary or paired, more or less similar; glumes usually membranous, lowest usually smaller or sometimes suppressed; lower lemma resembling the upper glume; upper lemma papery, awnless.

49a. Spikelets falling singly, not subtended by bristles, or if so, then the bristles persisting after the spikelets have fallen.

50a. Both florets fertile or if the lower male, then with the lemma hardened and similar to the upper glumes.

51a. Upper lemma and palea membranous, gapping at maturity. . . . . Coelachne

51b. Upper lemma and palea indurated, close at maturity. . . . . Isachne

50b. Upper floret alone fertile; lemma usually resembling the upper glumes and not hardened.

52a. Spikelets finely awned, or mucronate from the notched tip of the upper glumes and lower lemmas . . . . . Melinis

52b. Spikelets not awned or if awned then subsessile in false, secund, variously arranged and with awn from the entire tip of the upper glumes and lower lemma or from tips of both glumes.

53a. Spikelets arranged in more or less open panicles or with the panicles contracted and spike-like.

54a. Spikelets not subtended by bristle-like branchlets.

55a. Spikelets arranged in open or contracted panicles.

56a. Spikelets distinctly gibbous and laterally compressed. . . . Cyrtococcum

56b. Spikelets not or slightly gibbous.

57a. Fertile florets without lateral basal appendages or scars.

58a. Upper glumes as long as the spikelets. . . . . Panicum

58b. Upper glumes much shorter than the spikelets . . . . Ottochloa

57b. Fertile florets with lateral appendages or scars . . . . . Ichnanthus

55b. Spikelets arranged usually in cylindrical spike-like panicles.

59a. Upper lemma and palea close at apex; spikelets lanceolate . . . . Sacciolepis

59b. Upper lemma and palea gapping at apex . . . . . Hymenachne

54b. Spikelets subtended or replaced by one to many bristle-like branchlets which remain after the spikelets have fallen..... Setaria

53b. Spikelets arranged in one side of the spikes or spike-like racemes; spikes or racemes digitate or scattered, rarely solitary.

60a. Lemma of the upper floret more or less crustaceous or coriaceous, usually with

narrow inrolled margin, exposing the palea.

61a. Spikelets dorsally compressed or almost terete; the glumes and lower lemmas rounded on the back or only keeled at the tip.

62a. Lower glumes and lowest internodes of the rhachilla not forming a swollen callus at the base of the spikelets.

63a. Glumes and lemmas with laterally compressed and thickened apices. .Acroceras

63b. Glumes and lemmas not as above.

64a. Lower glumes (when present) turning away from the rhachis of the racemes or spikes; the back of the upper lemma facing it.

65a. Lower glumes developed.

66a. Glumes acuminate or awned, rarely only acute; upper lemma not mucronate.

67a. Leaf-blades linear; racemes dense; culms erect or sub-erect. . . . . Echinochloa

67b. Leaf-blades lanceolate to ovate; racemes loose to moderately dense; culms creeping or ascending . . . . . Oplismenus

66b. Glumes awnless; upper lemma acute . . . . . Paspalidium

65b. Lower glumes usually absent.. Paspalum

64b. Lower glumes turning towards the rhachis, the back of the upper lemma turned away from it.

68a. Lower glumes present . . . Brachiaria

68b. Lower glumes absent . . . Axonopus

62b. Lower glume and lowest internodes of the rhachilla forming a swollen callus at the base of the spikelets; upper lemma

mucronate or shortly awned . . . . . Eriochloa

61b. Spikelets laterally compressed, obliquely ovate, upper glumes boat-shaped, with rows of glands or hooked hairs or bristles between the nerves. . . . . Pseudochinolaena

60b. Lemma of the upper floret thinly cartilaginous, usually with flat, hyaline margins.

69a. Spikelets awned . . . . . Alloteropsis

69b. Spikelets awnless . . . . . Digitaria

49b. Spikelets with an involucre of bristles or subtended by a solitary bristle and falling with or without the bristle at maturity; . . . . . Pennisetum

48b. Spikelets often paired, with one sessile and the other pedicelled, those of each pair similar or more often dissimilar, rarely solitary and all alike; glumes as long as the spikelets and enclosing the florets more or less rigid and firmer than the lemma which are both hyaline or membranous; upper lemmas usually awned.

70a. Spikelets solitary, pedicelled or almost sessile at the nodes of the tough or fragile rhachis; inflorescence a single or of several racemes . . . .Dimeria

70b. Spikelets in pairs, rarely in threes, similar or dissimilar, a sessile and a pedicelled or one short, the other long-pedicelled, rarely the pedicelled one reduced or very rarely the sessile reduced to scales and the pedicelled spikelets developed.

71a. Spikelets of each pair similar, the sessile and the pedicelled hermaphrodite; the pedicelled very rarely female, rarely the sessile spikelet male and the pedicelled spikelet hermaphrodite; joints of the panicles thin, linear or somewhat expanded at the tip.

72a. Spikelets arranged in more or less ample panicles or compound racemes arranged along the central axis; upper lemma awnless or awned from the entire tip.

73a. Rhachis of racemes tough or tardily breaking up; spikelets dissimilar, deciduous from their pedicels.

74a. Upper lemma not or hardly 2-toothed.

75a. Panicles narrow, silvery; glumes very delicate; callus-hairs twice as long as the glumes or more . . . . Imperata

75b. Panicles broader or widely spreading; glumes indurated, brown or reddish brown; callus-hairs very short or absent; lemma awned.

76a. All spikelets pedicelled . . Miscanthus

76b. One spikelet pedicelled, the other sessile . . . . . Narenga

74b. Upper lemma cleft; branches of the panicle whorled . . . . . Eccoilopus

73b. Rhachis of the racemes breaking up; spikelets all similar . . . . . Saccharum

72 . Spikelets arranged in a single or in several racemes, the latter being digitate or arranged along a very short main axis; upper lemma usually awned.

77a. Lower glumes deeply or shallowly furrowed on the back . . . . . Microstegium

77b. Lower glumes more or less flat, very shallowly depressed, but not furrowed or rounded on the back.

78a. Lower glumes broadly truncate; pedicelled spikelets much reduced, usually represented by the pedicels only, very rarely present; stamens 2 . . . . . Apocopis

78b. Lower glumes not markedly truncate; pedicelled spikelets developed; stamens usually 3, rarely 2.

79a. Lower glumes 2-keeled, depressed between the keels.

80a. Upper glume not awned, or if awned the awn not more than 3 mm long. . . Eulalia

80b. Upper glume awned; awn 7-15 mm long . . . . . Pseudopogonatherum

79b. Lower glume convex on the back, at least at maturity. . . . . Pogonatherum

71b. Spikelets of each pair dissimilar, the sessile hermaphrodite and the pedicelled male or barren, or completely absent or if more or less similar, then the joints of the racemes and the pedicels thick and swollen.

81a. Joints of the rhachis and pedicel of the pedicelled spikelets swollen, 3-angled, rounded or flattened.

82a. Sessile spikelet with a male and a hermaphrodite floret; upper lemma awned, rarely awnless.

83a. Racemes many nodded, not contained in a spathe-like sheath; solitary, terminal, lower glume of sessile spikelets transversely grooved; coriaceous below, often wrinkled, furrowed or with nodules on the margin . . . . Ischaemum

83b. Racemes 1-nodded, reduced to three heteromorphous spikelets, enclosed in a boat-shaped sheath; lower glume otherwise . . . . . Apluda

82b. Sessile spikelets with a hermaphrodite floret only or occasionally with male floret below; upper lemma awned.

84a. Racemes several, at the tip of the peduncle. . . . . Thyrsia

84b. Racemes solitary, terminating the culm and branches.

85a. Sessile spikelets spherical; lower glume pitted all over.. . . Hackelochloa

85b. Sessile spikelets not spherical; lower glume not as above.

86a. Spikelets similar; rhachis very tough; joints and pedicels fused. . . . Hemarthria

86b. Spikelets more or less dissimilar; joints and pedicels free or fused.

87a. Spikelets paired, one sessile and the other pedicelled; spikelets in opposite rows; lower glumes of sessile spikelets entire at the tip....Rottboellia

87b. Spikelets solitary, sessile, the pedicelled suppressed; spikelets as above but with pedicels fused to the internodes; lower glumes of sessile spikelets entire with inflexed margin... ..... Ophiuros

81b. Joints of the rhachis and the pedicels narrow, seldom thickened upwards occasionally with a translucent longitudinal groove;

88a. Racemes not interrupted by spathes or solitary at the ends of the branches; the racemes collected into whorled panicles; joints and pedicels not furrowed.

89a. Spikelets dorsally compressed; rhachis-nodes and pedicels ciliate; lodicules hairy. . . . . Sorghum

89b. Spikelets compressed from the sides; rhachis and pedicels glabrous or hairy; lodicules glabrous.

90a. Spikelets in groups, each consisting of a sessile and 2 more or less reduced pedicelled spikelets or a raceme of several pairs; lower glumes smooth, not tuberculate . . . . . Chrysopogon

90b. Spikelets with many pairs of spikelets arranged in whorled racemes; lower glume

tuberculate. . . . . Vetiveria

88b. Panicles of racemes interrupted by spathes, or the espatheate racemes digitate or in pairs or solitary and terminal, sometimes the joints and pedicels with a translucent median furrow.

91a. Upper lemma of the sessile spikelet with a basal awn; sessile spikelet compressed from the side; pedicelled spikelets reduced .... Arthraxon

91b. Upper lemma of the sessile spikelet awned from the tip or from the cleft or upper lemma reduced to the hyaline base of the awn, very rarely awnless.

92a. Margins of the lower glume of the sessile spikelets sharply infolded, 2-keeled; awn glabrous.

93a. Upper lemma of the sessile spikelets not cleft, often stipitate and passing into the awn or not.

94a. Spikelets arranged in false racemes terminating the branches and branchlets of the true panicle; .... Capillipedium

94b. Spikelets arranged in false racemes which are either solitary and terminal or subsessile, arranged along a central axis but not at the tips of capillary branches.

95a. Joints and pedicels with a translucent longitudinal furrow. . . . . Bothriochloa

95b. Joints and pedicels without a translucent furrow.

96a. All pairs of spikelets heterogamous; upper lemma of sessile spikelets 2-fid. . . Pseudosorghum

96b. Lowest 1-3 pairs of spikelets homogamous; upper lemma of sessile spikelets reduced to the translucent base of an awn . . . Dichanthium

93b. Upper lemma of the sessile spikelets 2-lobed or 2-cleft, awned in the sinus.

97a. Aromatic grasses; racemes in pairs, supported by spathes, often collected into huge panicles; one pair of spikelets in each raceme homogamous, ... Cymbopogon

97b. Non aromatic grasses, racemes in pairs, or digitate or solitary;

98a. Racemes solitary at the end of the culm and branches; joints and pedicels often somewhat stout; pedicelled spikelets male, neuter or suppressed; pedicelled spikelets very small; upper glumes awnless; joints and pedicels clavate, 2-toothed.. . . . Schizachyrium

98b. Racemes 2-nate or more, rarely digitate, and all sessile spikelets hermaphrodite and alike, or the lowest more or less reduced and barren, but still resembling the upper fertile spikelets. . . . Andropogon

92b. Margins of the lower glumes inturned and rounded at the sides, at the most keeled upwards; callus mostly sharp and long; awn usually hairy.

99a. Racemes solitary at the ends of the branches, surrounded at the base by an involucre of homogamous spikelets; involucre spikelets sessile, not deciduous; callus of the fertile spikelets pointed. . . . . Themeda

99b. Racemes without an involucre; glumes often garnished with tubercle-based bristles; lower glumes of sessile spikelets terete, grooved or not on the back, usually covered with short hairs . . . . . Heteropogon

47b. Male and female spikelets in separate inflorescences, or in different parts of the same inflorescence and of different appearance.

100a. Female spikelets completely enclosed in a metamorphosed, leaf-sheaths; leaf-sheaths osseous or ivory beak-like structure . . . . . Coix

100b. Female spikelets not enclosed in a false involucre as above.

101a. Female spikelets in crowded longitudinal rows on a very thick axis; male spikelets in ample terminal panicles . . . . . Zea

101b. Female spikelets not as above; male spikelets axillary or terminal, in small panicle . . . . . Polytoca

Acroceras Stapf

Annuals or perennials, usually with long prostrate bases. Spikelets thickly crested in spiciform racemes, falling entire at maturity, solitary or 2-nate; lower florets male or barren with distinct palea; upper florets hermaphrodite; glumes subequal, pale below, with terminal crests placed at the end of the keels; the lower glumes 3-nerved and the upper 5-nerved; lower florets equalling the upper glumes; lemmas similar to the upper glumes; palea hyaline, 2-keeled or rounded at the back, laterally compressed, obscurely 5-nerved; palea similar to the lemmas. Lodicules 2, cuneate, fleshy. Stamens 3. Styles exserted; stigmas plumose. Caryopsis tightly enclosed by the lemma and palea.

KEY TO SPECIES

1a. Terrestrials; spikelets widely spaced or distant . . . . . tonkinense

1b. Marshy grasses; spikelets closely packed on panicle branches. . . . . zizanioides

Acroceras tonkinense (Balansa) C.E.Hubb. ex Bor in Ind. For. Rec. Bot. 1(3): 78. 1938 et in Fl. Assam 5: 201. 1940, & Grass. Burm. Ceyl. Ind. Pak. 275. 1960. - - Panicum tonkinense Balansa in Morot Journ. de Bot. 4: 140. 1890. - - P. latifolium Linn. var. majus Hook.f. Fl. Brit. India 7: 39. 1896.

Culms prostrate or erect from a prostrate base. Leaves linear-lanceolate with narrow base, margin wavy, dentate, sheaths hairy. Inflorescence a spreading panicle, axis scabrid, striate. Spikelets distant, lanceolate 4-6 x 2 mm. Lower glumes 4-5 mm long; upper glumes 4.5-5.5 mm long, 5-nerved; lower floret male; lemmas 4.5-5 mm long, coriaceous, hairy at apex; paleas 3.5-4 mm long, linear-lanceolate. Upper floret hermaphrodite: lemmas 5 mm long, glabrous, compressed, 5-nerved; paleas 3.5-4.5 mm long; lodicules 2, auricled. Stamens 3. Styles 2. Caryopsis oblong.

Common in dense forests, of low elevations.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1552 Lailad (Khasi Hills); 1971 Tura peak (Garo Hills).

Acroceras zizanioides (H.B.& K) Dandy in Journ. Bot. 69: 54. 1931; Bor in Fl. Assam 5: 199. 1940 et in Grass. Burm. Ceyl. Ind. Pak. 275. 1960. - - Panicum zizanioides H.B.& K. Nov. Gen. et Sp. Pl. 1: 100. 1896. - - P. latifolium Hook.f. Fl. Brit. India 7: 39. 1896 (Plate 33).

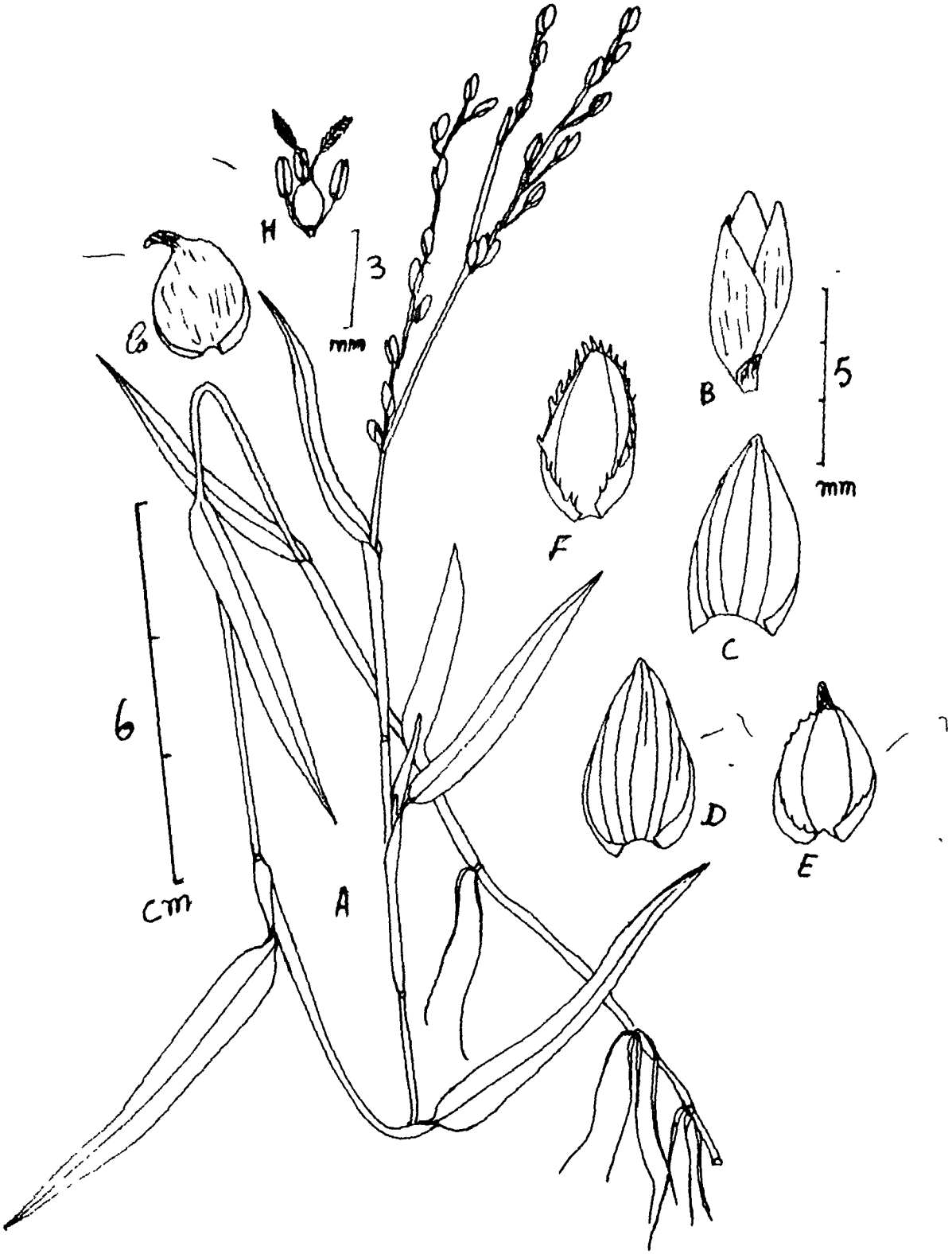

Plate 33 Acroceras zizanoides (H.B. & K.) Dandy A.Habit, B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lemma, F.Palea, G.Lodicule, H. Pistil with Androecium.

Culms erect or prostrate, 0.5-1 m high, rooting at the lower nodes, glabrous. Leaves 5-10 x 0.5-1 cm, acute, rounded at the base. Inflorescence a panicle. Spikelets dense, arranged on the main axis, 6 x 2 mm; lower glumes ovate-lanceolate, 1.5-2 mm long, 3-5-nerved. Upper glumes equal to the spikelet, 3-nerved, compressed. Lower floret barren: lemma same as the upper glume; palea reduced, scabrid. Upper floret hermaphrodite 5 mm long; lemma minute, mucronate, tip recurved; palea same in texture as the lemma. Stamens 3; anthers 2-3 mm long. Styles 2; stigmas feathery. Caryopsis compressed on one side, shining, 4 mm long.

Occasional in marshes and margins of tanks, lakes etc. in forests.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1992 Tasak (Garo Hills).

Agrostis Linn.

Annuals or perennials. Leaves flat. Spikelets small, 1-flowered, hermaphrodite, shorter than the glumes. Glumes equal, oblong, awnless, usually 1-nerved. Lemmas oblong, membranous, 3-5-nerved, awned from the back or awnless. Palea as long as lemmas, with ciliate keels, 2-nerved or nerveless. Lodicules 2, lanceolate, hyaline. Stamens 3. Ovary glabrous; stigmas plumose, laterally exserted. Caryopsis oblong, slightly compressed.

K E Y T O S P E C I E S

1a. Lemmas awnless, glabrous.

2a. Palea minute or absent, less than one-half the length of the lemma.

3a. Leaves narrow, not more than 3 mm wide; anthers 6 mm long . . . . . Micrantha

3b. Leaves 0.5-1 cm across; anthers less than 6 mm long. . . . . myriantha

2b. Palea half as long as the lemma or longer.

4a. Rhachilla produced. . . . . zenkeri

4b. Rhachilla not produced. . . . stolonifera

1b. Lemmas awned. . . . . filipes

Agrostis filipes Hook.f. Fl. Brit. India 7: 256. 1896; Bor in Fl. Assam 5: 140. 1940 et in Grass. Burm. Ceyl. Ind. Pak. 387. 1960.

Annual grasses. Culms tufted, branched at the base, 30-60 cm high. Leaves usually radical, blades 5-20 x 0.2-0.5 cm, glabrous or minutely scaberulous, acute, margin scabrid; sheaths loose, striate. Ligule membranous, ciliate. Panicles contracted, branches short, whorled; rhachilla capillary. Pedicels scabrid. Spikelets linear, acute, 2 mm long, usually purple. Lower glumes 2 mm long, 1-nerved, acute; upper glumes similar to the lower one. Lemmas 1.8 mm long, 5-nerved, awn geniculate from the back of the lemma; palea minute, hyaline. Stamens 3. Styles 2, with plumose stigmas. Caryopsis ovoid, lanceolate.

Frequent in open areas as well as along banks of streams and in wet soils.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 1517 Jowai (Jaintia Hills); 1576 Shillong (Khasi Hills).

Agrostis micrantha Steud. Syn. Gram. 1: 170. 1854; Hook.f. Fl. Brit. India 7: 256. 1896; Bor in Fl. Assam 5: 141. 1940 et in Grass. Burm. Ceyl. Ind. Pak. 388. 1960.

Tall slender grasses. Culms 50-80 cm high. Leaves linear, 5-20 x 0.2-0.4 cm, slightly scabrous, subobtuse. Ligules membranous, oblong, 2 mm long. Panicles spreading, 8-20 cm long; branches and branchlets capillary. Spikelets oblong, Glumes 1-2 mm long, cymbiform, slightly scabrous, on the dorsal face; lemmas as long as the glumes, membranous, hyaline. Loaicules linear, hyaline. Caryopsis lanceolate, brownish.

Common in marshy fields.

Fls. & Frts. : May to September.

Specimens examined: Myrthong 1718 Shillong.

Agrostis myriantha Hook.f. Fl. Brit. India 7: 257. 1896; Bor in Fl. Assam 5: 141. 1940 et in Grass. Burm. Ceyl. Ind. Pak. 388. 1960 (Plate 34).

Perennial grasses. Culms up to 1.5 m high, leafy. Leaves 10-30 x 0.5-1 cm, scaberulous. Ligules membranous. Panicles 20-30 cm long, contracted, dense flowered; branches fascicled or whorled. Pedicels short, clavate, glabrous. Spikelets 1.25 mm long, Glumes subequal, 1-nerved, keeled; lemmas glabrous, truncate 5-nerved, awnless. Palea minute. Stamens 3. Stigmas plumose. Caryopsis ovoid, shining.

Common in edges of scrub-jungles and along the banks of streams and rivulets in secondary forests.

Fls.& Frts. : August to December.

Specimens examined: Myrthong Shillong.

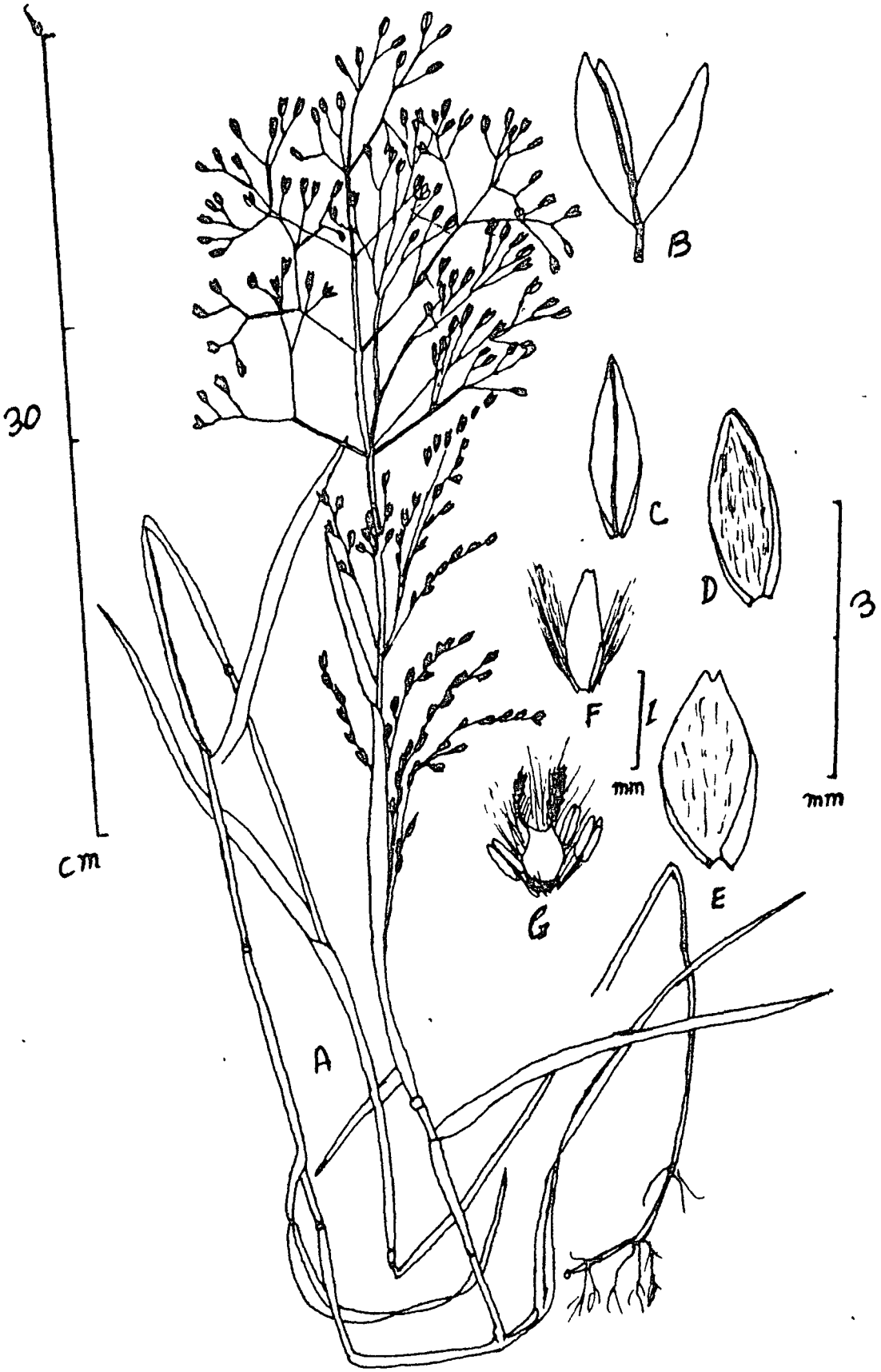

Plate 34 Agrostis myriantha Hook. f. A. Habit B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Pistil with Androecium.

Agrostis stolonifera Linn. Sp. Pl. 62. 1753; Bor in Fl. Assam 5: 139. 1940 et Grass. Burm. Ceyl. IndiaPak. 390. 1960.

Annuals. Culms prostrate or decumbent, from a rooting base. Leaves linear, acute, or subobtuse, scabrid on the ribs and on the margins; blades 20 x 0.3-0.5 cm; sheaths striate, loose, glabrous. Ligule a long white membrane up to 6 mm long. Panicles pyramidal, usually purple. Branches and branchlets very scabrid; lower branches 5-10 cm long, pedicels short or as long as the spikelets, scabrid, swoolen at the tip, acute, 1.8-2.5 mm long; lower glumes ovate, acute, 2 mm long, margin scabrid, 1-nerved, keels scabrid; upper glumes same in texture as the lower one. Lemma ovate, oblong, apex erose, hyaline, glabrous, obscurely 5-nerved, awnless. Palea hyaline, nerveless. Stamens 3, adnate when dry; anthers as long as the palea. Style short, stout; stigmas feathery.

Occasional in ditches, along the road sides and in fields.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 1859 Shillong.

Agrostis zenkeri Trin. in Mem. Acad. Sci. Petersb. Ser. 6, 6,2: 363. 1841; Bor Grass. Burm. Ceyl. Ind. Pak. 392. 1960. - - Deyeuxia abnormis Hook.f. Fl. Brit. India 7: 268. 1896. - - Agrostis abnormis Munro in Cat. Pl. Griffith, Falconer et Helfer, 57. 1865 nomen nudum; Bor in Fl. Assam 5: 142. 1940.

Annuals. Culms tufted or solitary, glabrous, up to 60 cm high. Leaves soft, 5-15 x 0.2-0.4 cm, scabrid on the margin,

sheaths loose, striate. Ligules truncate. Panicles effuse, branches, filiform, flexuous, 5-10 cm long, pedicels scabrid, clavate towards the tip. Spikelets 1.5-2.3 mm long, oblong, acute; glumes subequal, ovate, acute, keels scabrid, 1-nerved. Lemmas ovate, acute, obscurely nerved; callus bearded, as long as half the length of the lemma; palea hyaline, as long as the callus. Stamens 3; anthers short. Styles 2, short with feathery stigmas. Caryopsis elliptic, shining.

Common on the embankments and also in forests.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1045 Shillong.

Alloteropsis J.S. Presl. ex C.B. Presl.

Alloteropsis semialata (R.Br.) Hitch. in Contrib. U.S. Nat. Herb. 12: 210. 1909; Bor in Fl. Assam 5: 213. 1940 et Grass. Burm. Ceyl. Ind. Pak. 276. 1960. - - Panicum semialatum R.Br. Prodr. 192. 1810. - - Axonopus semialatus (R.Br.) Hook.f. Fl. Brit. India 7: 64. 1896.

Erect grasses. Culms 20-80 cm high, base thickened, with silky leaf-sheaths. Leaves linear, 5-30 x 0.5-0.8 cm, hairy, acute. Inflorescence of 2-4, false spike-like racemes, digitate, 4-8 cm long. Spikelets subsessile. Lower glumes small, hyaline, unequal at base; upper glumes larger, margin scaberulous, pinkish-green; lemma hairy, black or dark brown, acute. Palea similar to the lemma. Stamens 3; anthers 3 mm long, yellow. Styles 2; stigmas feathery.

Common in exposed slopy areas, often forming dense patches.

Fls. & Frts. : April to November.

Specimens examined: Myrthong 1709 Jowai (Jaintia Hills); 1573 Shillong (Khasi Hills).

Alopecurus Linn.

Alopecurus myosuroides Huds. Fl. Angl. 23. 1762; Bor Grass. Burm. Ceyl. Ind. Pak. 393. 1960.

Annuals. Culms solitary or tufted, erect from a slightly geniculate base, glabrous, 10-30 cm high. Leaves linear, obtuse, 3-20 x 0.5-0.8 cm, glabrous. Sheaths loose, striate; ligules membranous. Panicle cylindric, 3-8 cm long, tapering towards the apex. Spikelets condensed in rhachis, deciduous, ovate-oblong, 4-6 mm long, awned. Glumes equal and of the same texture; lemmas broad, twice as long as the glumes, glabrous, 5-nerved, obtuse, awned near the base of the lemma on the dorsal surface. Palea 0. Stamens 3. Stigmas feathery. Caryopsis globose, acute.

Profuse weeds of paddy fields; it forms a good fodder.

Fls. & Frts. : May to January.

Specimens examined: Myrthong 1516 Shillong; 1578 Jowai.

Andropogon Linn.

Andropogon ascinodis Cl. in Journ. Linn. Soc. Bot. 25: 87. t. 36. 1889; Bor in Fl. Assam 5: 330. 1940 et Grass. Burm. Ceyl. Ind. Pak. 90. 1960. - - A. apricus Trin. in Mem. Acad. Petersb. 4(6): 83. 1836; Hook.f. Fl. Brit. India 7: 169. 1896.

Perennials. Culms tufted, erect from a thick rootstock, 0.5-1.5 m high, glabrous, golden yellow. Leaves 40-80 x 0.1-0.5 cm, setaceous, finely acuminate; sheaths scabrid or glabrous, brown, membranous. Racemes enclosed by green spathes. Spikelets sessile, laterally compressed. Lower glumes membranous, truncate, with many white hairs, 2-5 mm long; upper glumes cymbiform, very hairy on the margins, 3-6 mm long, apex hispid. Lemmas white, hyaline, acute, awned; awn very long up to 5 cm long or sometimes more. Stamens 3; anthers brownish yellow, 2-celled. Stigmas feathery, yellow.

Common under pine forests associated with other tall grasses.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1345 Tura (Garo Hills); 1481 Shillong (Khasi Hills); S.R. Sherma 15982 Nartiang (Jaintia Hills) (ASSAM).

Anthoxanthum Linn.

Annuals or perennials. Leaves linear-lanceolate. Spikelets oblong to narrow lanceolate; rhachilla disarticulating above the upper glumes. Florets 3, lower 2 florets barren or male; the upper floret bisexual. Basal glumes unequal, persistent; lower small, 1-nerved; upper longer, 3-nerved. Lemmas of male or barren florets awned. Terminal lemma 1-7-nerved; lower 2 lemmas emarginate, membranous, 5-7-nerved; awn of lower lemma short; awn of the upper lemma longer and kneed near the base. Paleas present or absent. Lodicules absent. Stamens 3 in male florets and 2 in hermaphrodite. Stigmas exserted from the top of the spikelets, plumose.

K E Y T O S P E C I E S

1a. Annuals, culms geniculate; panicles with looser spikelets, , ... aristatum

1b. Perennials, culms not geniculate; panicles with dense spikelets.

2a. Spikelets secund, spreading; plants tall, up to 1.2 m high. . . . . clarkei

2b. Spikelets not secund; plants short, less than 1 m high . . . . . odoratum

Anthoxanthum aristatum Boiss. Voy. Bot. Esp. 2: 638. 1839; Bor in Fl. Assam 5: 164. 1940.

Roots fibrous. Culms glabrous, 12-40 cm high. Leaves with few scattered hairs, subacute. Ligule hyaline, truncate. Spikes 2-8 cm long. Spikelets loosely arranged, 5-8 mm long; pedicels short. Lower glumes 3 mm long, upper glumes 8 mm long, acute, hyaline and dorsal keels with spine-like hairs. Lemmas tomentose with silvery hairs and with long awn. Lodicules 2, hyaline, rounded. Stamens 2; anthers 2 mm long. Stigmas feathery, longer than the stamens.

Common on hills, in open areas.

Fls. & Frts. : March to July.

Specimens examined: Kyrthong 1528 Shillong (Khasi Hills).

Anthoxanthum clarkei (Hook.f.) Ohwi in Bull. Tokyo Sci. Mus. 18: 8. 1947; Bor Grass. Burm. Ceyl. Ind. Pak. 3431. 1960. - - Hierochloe clarkei Hook.f. Fl. Brit. India 7: 223. 1896; Bor in Fl. Assam 5: 167. 1940.

Annuals; culms up to 1 m high, erect from a geniculate base, glabrous, nodes swollen, hairy. Leaves 15-30 x 1-1.2 cm, hairy, apex acute; leaf-sheaths hairy; ligules membranous, ciliate, 2 mm long. Panicles secund; rhachis glabrous. Spikelets 6 mm long, acute. Pedicels clavate. Lower glumes 4-4.5 mm long, purple, near the median nerves, strongly 1-nerved, apex subacute, margin scabrid; upper glumes as long as the spikelets, 3-nerved, purple on one side, acute, margin hylaine, membranous. Lower lemma very hairy, 5 mm long, deeply 2-lobed, with stout awn at the back in between the lobes, nerveless, light yellow, awn up to 8 mm long; upper lemma same in texture as the lower one. Palea linear, hyaline, scaberulous, 2-lobed, 5-5.5 mm long. Lodicules 2, embracing the caryopsis, nerveless, one smaller. Stamens 3; anthers 3 mm long. Styles 2, with weak stigmas.

Rare, collected only from Nongkrem, along the bank of the streams.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3285 Nongkrem (Khasi Hills).

Anthoxanthum odoratum Linn. Sp. Pl. 28. 1753; Hook.f. Fl. Brit. India 7: 222. 1896; Bor in Fl. Assam 5: 164. 1940 et Grass. Burm. Ceyl. Ind. Pak. 431. 1960.

Perennials. Culms erect from a geniculate base, up to 60 cm high. Leaves flat, narrowed towards the apex; blades with tubercle-based hairs; sheaths striate, glabrous. Ligules membranous, 4 mm long. Panicles erect, 2-8 cm long. Spikelets linear-lanceolate, acute, up to 8 mm long ; pedicels short. Lower glumes 3.5 mm long, acute, distinctly 1-nerved, with 1-3 tubercle

based hairs on the keel. Upper glumes as long as the spikelets, broadly ovate-lanceolate, clasping, distinctly 3-nerved, apex sub-cuspidate, glandular. Lemmas oblong, 2-lobed, awned in between the lobes; lower lemma awned near the base, upper lemma awned near the apex, nerveless, ciliate. Paleas rounded, 1.5 mm long, obscurely nerved. Stamens 3; anthers 3.3 mm long; styles 2, flexuous, stigmas plumose.

Common in marshy areas.

Fls. & Frts. : March to November.

Specimens examined: Myrthong 2981 Shillong.

Apluda Linn.

Apluda mutica Linn. Sp. Pl. 82. 1753; Bor in Fl. Assam 5: 432. 1940 et Grass. Burm. Ceyl. Ind. Pak. 93. 1960; Babu Herb. Fl. Dehra Dun 582. 1977.

Vern.- ' Langphreit ' (K).

Perennials. Culms tall, 1-2 m high, glaucous, with swollen nodes. Leaves flat, acute, 15-40 x 1-2 cm, 8-14-nerved, hairy on the ventral face; sheaths spathe-like. Panicles terminal of many racemes, each raceme usually developing in the axil of a spathe-like leaf. Spikelets 3-nate, pedicelled, lower glumes cymbiform, thick, many-nerved; upper glumes hyaline, provided with twisted awn. Stamens 3; anthers long, 2-celled; styles 2; stigmas feathery.

Common in hills, associated with ferns, along banks of streams.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1340 Shillong (Khasi Hills), 3086 Sohkha (Jaintia Hills).

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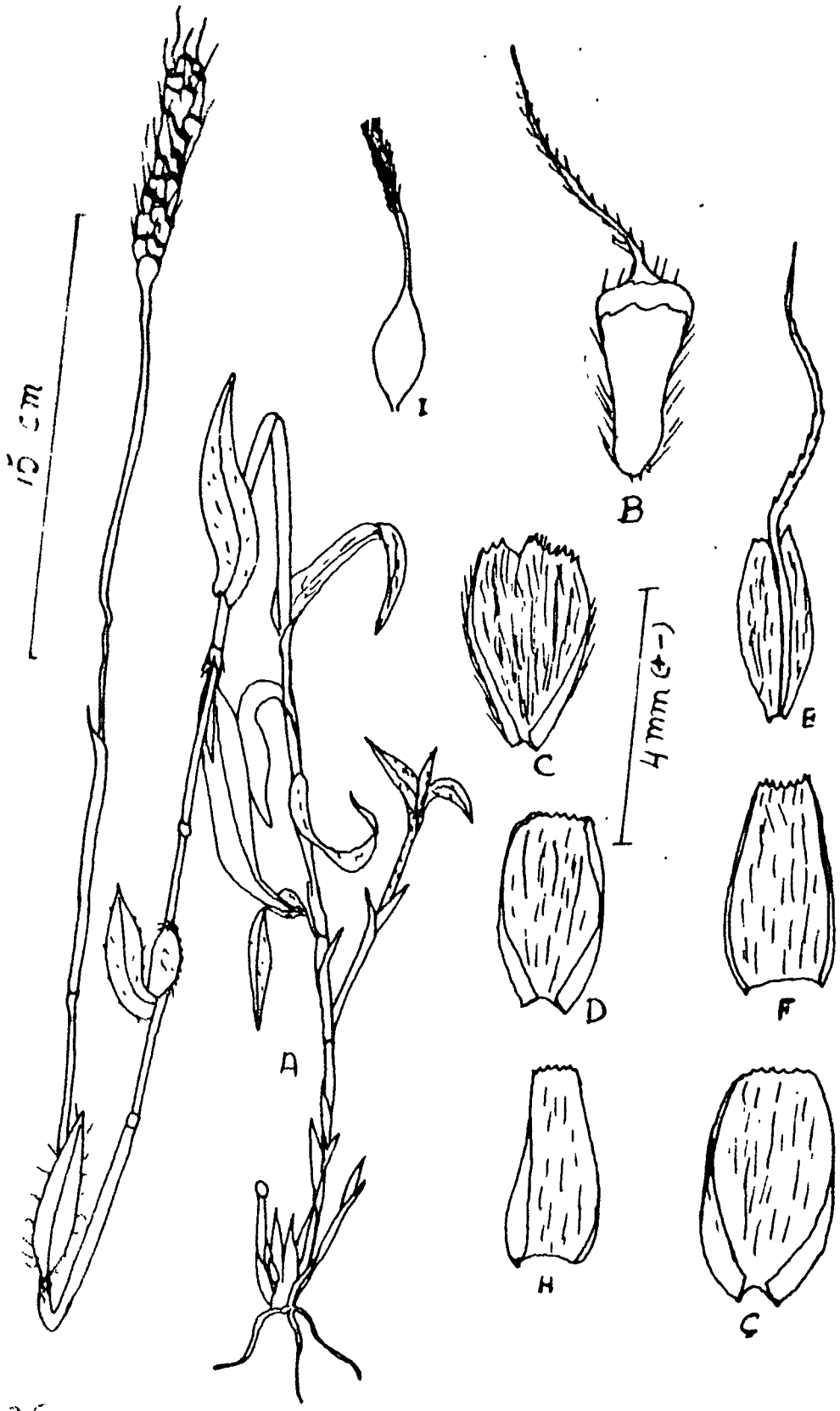


Plate 35 Apocopsis paleaceus (Trin.) Hochr. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. & H. Lodicules, I. Pistil.

Apocopis Nees

Apocopis paleacea (Trin.) Hochr. innBull. N. Y. bot. Gard. 6: 262. 1910; Bor in Fl. Assam 5: 349. 1940 et Grass. Burm. Ceyl. Ind. Pak. 96. 1960. - - Ischaemum paleaceum Trin. in Mem. Acad. Sci. Patersb. 2(6): 293. 1832 (Plate 35).

Culms 0.5-1 m high, tufted. Leaves linear-lanceolate, hairy, margin scabrid, acuminate, 4-15 x 0.5 cm. Ligule truncate. Spikes 2-5 x 0.5 cm. Spikelets sessile, streaked with purplish-brown. Lower glumes 4 mm long, truncate with a tuft of silvery hairs at the base; upper glumes brown, lanceolate, truncate, margin incurved, muticous. Lemma 4-5 mm long, 2-toothed, mucronate, or shortly awned, awn twisted at base, strongly 1-nerved. Palea equalling the lemma, nerveless. Stamens 2; anthers up to 2.5 mm long. Stigmas long, flexuous, slightly hairy. Caryopsis brown, oblong.

Common in marshy places specieally in water channels and embankments of the paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1083 Shillong; N.L. Bor 13984 Nongpogh (Khasi Hills); S.R. Sherma 15986 Nartiang (Jaintia Hills) (ASSAM).

Arthraxon P. Beauv.

Annuals or perennials. Leaves cordate with spinulose margin. Spikelets solitary or 2-nate, one sessile and the other pedicelled; male often reduced to pedicel; the other sessile, 2-flowered, hermaphrodito, awned. Lower glumes often mucronate, not embracing the upper glumes; upper glumes narrow, lanceolate,

3-nerved. Lower florets neuter; lemma hyaline; upper florets hermaphrodite awned from just above the base or sometimes reduced to a mucro. Palea small or absent. Lodicules 2, truncate, cuneiform. Stamens 1-3; stigmas plumose. Caryopsis narrow, fusiform.

K E Y T O S P E C I E S

1a. Stamens 3.
  2a. Pedicelled spikelets male, sessile one dorsally compressed.. . . . . echinatus
  2b. Pedicelled spikelets suppressed.
    3a. Anthers very long, as long as the spikelets; common peduncles glabrous. . . . . breviaristatus
    3b. Anthers much shorter than the spikelets; common peduncles sparsely hairy. . . . . nudus
1b. Stamens 2.
  4a. Pedicelled spikelets suppressed; pedicels reduced or completely suppressed. . . . . hispidus
  4b. Pedicelled spikelets at the upper nodes of the racemes; pedicels well developed, ciliate . . . . . lancifolius

Arthraxon breviaristatus Hack. in DC., Monogr. Phan. 6: 350. 1889; Hook.f. Fl. Brit.India 7:144.1896; Bor in Fl. Assam 5: 376. 1940 et Grass. Burm. Ceyl. Ind. Pak. 101. 1960.

Annuals or perennials. Culms decumbent, 40-50 cm high, branched above, flat on one side. Leaves amplexicual, elliptic, acute, margin ciliate or ciliolate. Leaf-sheaths clasping, glabrous or shortly hairy near the base of the leaf-blade. Ligules of long tufted hairs. Racemes 5-7, subdigitate, spreading. Spike-

lets 4-5 mm long, excluding the awn, lanceolate, convex, acute. Lower glumes oblong-lanceolate, as long as the spikelets, 7-9-nerved, acute, margin smooth, keels scaberulous; upper glumes as long as or longer than the lower glumes, 3-nerved, brownish-pink, apex with 3-unequal lobes stripped with pinkish brown on both sides; lemmas 3 mm long, shortly 2-lobed, 3-nerved, brownish pink; awns developing from the back near the base; palea oblanceolate, hyaline, 2.5 mm long. Lodicules 2, reduced to strap-like structures, ciliolate. Stamens 3; anthers yellow, 2.5-3 mm long. Styles 2; stigmas plumose.

Frequent in drains and water channels in open areas.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1146 Shillong.

Arthraxon echinatus (Nees) Hochst. in Fl. 391: 188. 1856; Bor in Fl. Assam 5: 375. 1940 et Grass. Burm. Ceyl. Ind. Pak. 99. 1960. — —

Annuals. Culms creeping for some distance and then erect, rooting at lower nodes. Leaves elliptic, acute, base cordate, amplexicual, glabrous, blades 2-5 x 1-2 cm, margin scabrid; sheaths loose, hairy. Ligules erose, membranous, 1-2 mm long. Racemes paniculate, subdigitate, about 6 cm long. Spikelets sessile, 4 mm long. Lower glumes elliptic-lanceolate, cuspidate, margin scabrid, 7-9-nerved; upper glumes linear-lanceolate, about 4.3 mm long, hyaline on both sides, 3-nerved, apex unequally 3-lobed, keel scabrid. Lemmas lanceolate, as long as half the spikelets, nerveless, awned. Palea reduced to small warty scales. Stamens 3; anthers 2-3 mm long. Styles 2, stigmas feathery.

Occasional in ditches and in abandoned agricultural lands.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1294 Dawki (Jaintia Hills).

Arthraxon hispidus (Thunb.) Makino. in Bot. Mag. Tokyo 26: 214. 1912; Bor in Fl. Assam 5: 378. 1940 et Grass. Burm. Ceyl. Ind. Pak. 99. 1960. - ~~7~~ Phalaris hispida Thunb. Fl. Jap. 44. 1784.

Culms prostrate for some distance and then erect, rooting at the nodes. Leaves ovate, sparsely hairy, base rounded, 2-3 x 1-2 cm. Racemes in panicle, digitate, 2-8, 4-8 cm long. Spikelets solitary at the nodes of the rhachis. Lower glumes 3-4 mm long, scabrid, pinkish brown; upper glumes hyaline, with twisted awn, Stamens 2-3. Stigmas feathery.

Common in marshy places; a weed of paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1130 Shillong; 1240 Mawsmai (khasi hills) 1817 Sohkha (Jaintia Hills).

Arthraxon lanceifolius (Trin.) Hochst. Fl. 39: 188. 1856; Bor in Fl. Assam 5: 378. 1940 et Grass. Burm. Ceyl. Ind. Pak. 100. 1960; Babu Herb. Fl. Dehra Dun 583. 1977. - - Andropogon lancifolius Trin. Mem. Acad. Imp. Sci. St. Petersb. 2(6): 271. 1832. - - Arthraxon microphyllus Hochst. in Fl. 39: 188. 1856; Hook.f. Fl. Brit. India 7: 147. 1896.

Culms decumbent, branched, 15-30 cm high, rooting at lower prostrate nodes. Leaves amplexicual, hairy on both sides, blades 1-2 x 0.2-0.8 cm, acute. Racemes terminal, linear, 2-10, covered with dense, white cottony hairs. Spikelets 4 mm long, hairy.

Glumes scabrid, acute;awn about 1.2 cm long,adpressed to the groove of the lower lemma. Stamens 2. Styles filiform.

Common on rock crevices.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1124 Shillong; 1206 Mawmluh (Khasi Hills).

Arthraxon nudus (Steud.) Hochst. in Fl. 39: 188. 1856; Bor in Fl. Assam 5: 377. 1940 et Grass. Burm. Ceyl. Ind. Pak. 101. 1960; Babu Herb. Fl. Dehra Dun 584. 1977 - - Andropogon nudus Steud. Syn. Pl. Glum. 1: 383. 1854 nomen.

Culms prostrate, rooting at lower nodes. Leaves ovate-lanceolate, cordate, amplexicual, tomentose, ciliate on margins. Blades 4-8 x 1-2 cm, acute; sheaths ciliate on the outer margin. Ligules membranous, 2 mm long. Inflorescence a digitate panicle of false spike or racemes, 6-8, exserted out from the the leaf-like spathes. Spikelets pedicelled, dirty brown with long twisted awns. Lower glumes 3 mm long, dirty brown, scabrid, cymbiform; upper glumes glabrous. Lemmas membranous, hyaline, 2-toothed, awned. Stamens 2. Stigmas plumose, brown.

A weed of marshes and ditches both in open and shaded localities.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1313 Shillong; G.K.Deka 13871 Tharia (Khasi Hills) (ASSAM).

Arundinella Raddi.

Annuals or perennials. Culms erect, tufted or solitary. Leaves linear-lanceolate. Ligules short, truncate. Panicles erect. Spikelets unequally pedicelled, continuous with or imperfectly jointed on slender branches of panicles. Florets 2, dissimilar in structure and sex; lower male or sterile, rarely bisexual; upper bisexual, smaller than lower. Glumes persistent, subequal or unequal. Lower lemmas 3-7-nerved; palea narrow, 2-keeled; upper lemma awned from the tip or sinus when cleft. Lodicules 2. Stamens 3. Ovary glabrous. Styles distinct, stigmas laterally exserted. Caryopsis oblong or ellipsoid, slightly compressed.

K E Y T O S P E C I E S

1a. Upper lemma with 2 setae, on each side of the awn.
  2a. Spikelets loose, distinctly pedicelled.... setosa
  2b. Spikelets crowded, subsessile or very shortly pedicelled. . . . . khaseana
1b. Upper lemma with a single awn or without awn; setae absent.
  3a. Panicle cylindric, with secund spikelets; awn not more than 2 mm long. . . . bengalensis
  3b. Panicle spreading, with scattered spikelets; awn when present longer than 5 mm long.
    4a. Panicle contracted; rhachis long ciliate . . . . . intricata
    4b. Panicle effuse, rhachis often scaberulous . . . . . nepalensis

Arundinella bengalensis (Spreng.) Druce in Rep. Bot. Exchng. Club. Brit. Isles 605. 1916; Bor in Fl. Assam 5: 185. 1940 et Grass. Burm. Ceyl. Ind. Pak. 421. 1960; Babu Herb. Fl. Dehra Dun 585. 1977. - - Panicum bengalense Spreng. Syst. Veg. 1: 311. 1825.

Vern.- ' Langtylli ' (K).

Culms 1 m high, erect, glabrous or sometimes hairy at nodes. Leaves tomentose, linear, 5-30 x 0.5-1 cm, acute, convolute when dry; sheaths very hairy, striate. Panicles cylindric. Spikelets secund, axis angular, scabrid; pedicelled spikelets elliptic, acute, 3 mm long, 2-flowered. Lower glumes ovate, 3-nerved, toothed at the apex; upper glumes cymbiform, slightly longer than the lower, acute. Lemma same as the upper glumes . Palea membranous, hyaline. Stamens 3; anthers 1 mm long. Stigmas feathery.

Common in pine forests and fallows.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1009, 1177, 1330 Shillong; 1243 Mawmluh (Khasi Hills).

Arundinella intricata Hughes in Kew Bull. 1920: 112. 1920; Bor in Fl. Assam 5: 183. 1940 et Grass. Burm. Ceyl. Ind. Pak. 422. 1960.

Perennials. Culms 0.5-1.25 m high, tufted. Leaves 5-20 x 0.2-0.5 cm, convolute, glabrous, apex subacute; sheaths glabrous, except at the mouth. Ligules membranous with a ring of hairs on margin. Panicles 10-15 cm long, branches subsolitary; rhachis angular, scabrid. Pedicels clavate, shorter or longer than the spikelets, scabrid. Spikelets 4-5 mm long. Lower glumes 3 mm long

3-nerved, acute, setaceous; upper glumes as long as the lower one, ovate, acute or subaristate, 5-nerved. Lemma ovate-lanceolate, 3-nerved, acute; palea linear, nerveless, apex erose. Lodicules 2, 2 mm long, nerveless. Stamens 3. Styles 2. Caryopsis elliptic, acute.

Grows on rock crevices on the beds of rivers, streams, etc.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 2990 Pongtung (Khasi Hills).

Arundinella khaseana Nees ex Steud. Syn. Pl. Glum 1: 115. 1854; Hook.f. Fl. Brit. India 7: 71. 1896; Bor in Fl. Assam 5: 181. 1940 et Grass. Burm. Ceyl. Ind. Pak. 422. 1960.

Vern.- ' Jalyeit ' (K).

Tufted plants. Culms robust 1-2 m high, glabrous, ribbed. Leaves 10-40 x 0.2-1.5 cm, hairy, margin rough , apex acute. Ligules reduced to a hairy ring. Panicles thyrsiform, branches subverticillate; rhachis villous. Spikelets 6-8 mm long, 1-flowered Lower glumes lanceolate, 5-nerved, acute with long tubercle based hairs; upper glumes similar to the lower ones. Lemmas hyaline, 2-keeled, with geniculate awn. Palea hyaline, nerveless. Stamens 3. Stigmas feathery.

Common in marshes, rarely in forests.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1121 Shillong; 1798 Pariong (Khasi Hills).

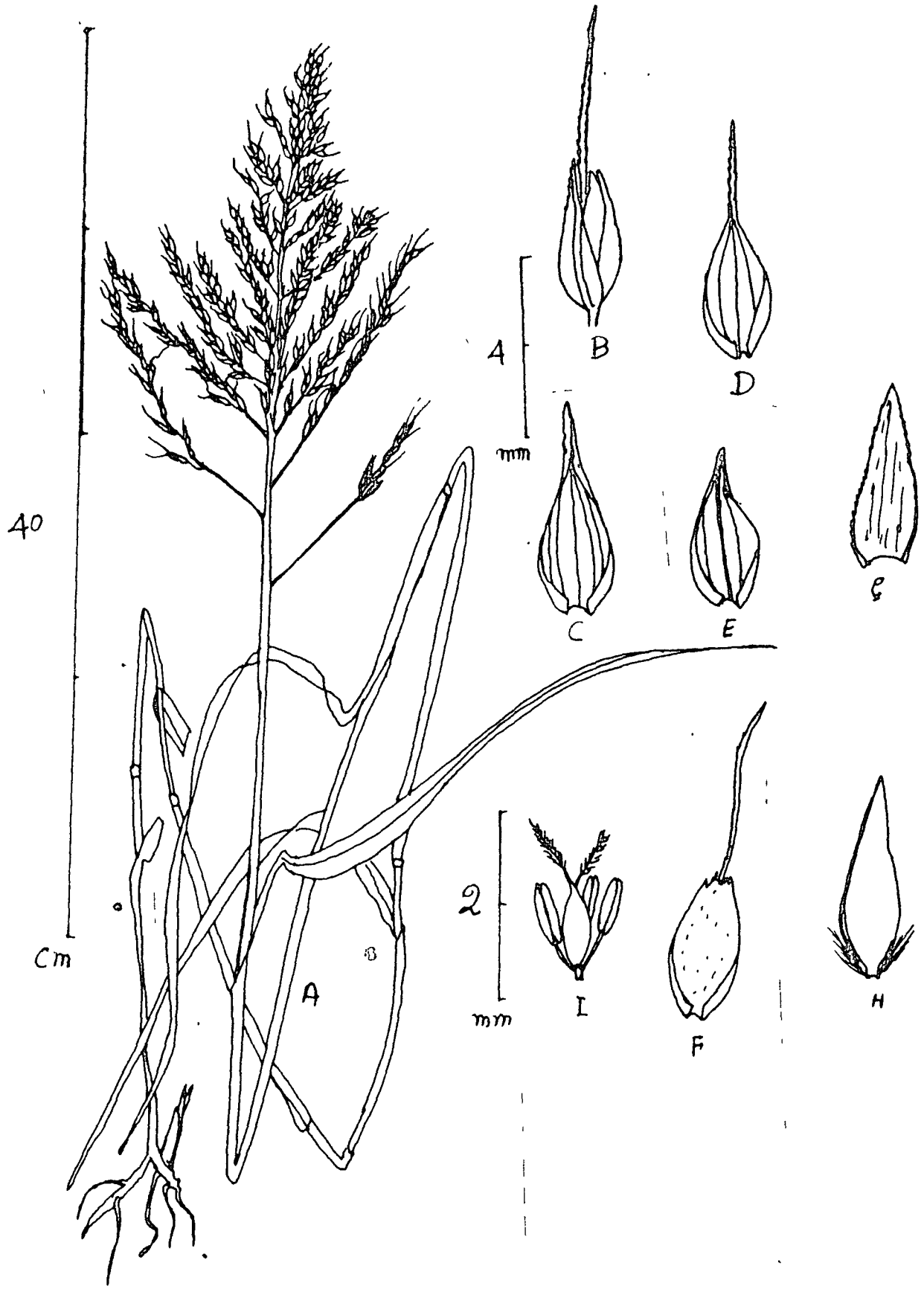


Plate 36 Arundinella nepalensis Trin. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glun , E. Lower Lemma, F. Upper Lemma, G. Palea, H. Lodicule, I. Androecium & Gynoecium.

Arundinella nepalensis Trin. Gram. Panic. 62. 1826; Bor in Fl. Assam 5: 183. 1940 et Grass. Burm. Ceyl. Ind. Pak. 423. 1960; Jain in Rec. bot. Surv. India 20(2): 233. 1973; Babu Herb. Fl. Dehra Dun 586. 1977 (Plate 36).

Vern.- ' Langtylli ' (K).

Rootstock stout, condensed, with many erect culms. Culms tall up to 2 m high, glabrous. Leaves variable 15-35 x 0.5-1.5 cm, obtuse, very hairy with tubercle based hairs; base rounded; sheaths loose, villous; ligules a ring of short hairs. Panicles 10-40 cm long. Spikelets elongate, 4-5 mm long; rhachis scabrid. Lower glumes 3 mm long, keels scabrid, 3-nerved; upper glumes linear, lanceolate, triangular, glabrous, about 4 mm long. Lemma hyaline, 2 mm long, awned. Palea hyaline, smaller than the lemma. Stamens 3; anthers stout, Stigmas filiform.

Common undergrowth in pine forests.

Fls. & Frts. : August to December.

Specimens examined : Myrthong 1329 Shillong (Khasi Hills); N.L.Bor 10425 Jowai (Jaintia Hills).

Arundinella setosa Trin. Diss. Gram. Panic. 63. 1826; Hook. f. Fl. Brit. India 7: 70. 1896; Bor in Fl. Assam 5: 180. 1940 et Grass. Burm. Ceyl. Ind. Pak. 425. 1960.

Perennials. Rootstock stout, with dry hairy sheaths. Culms erect, tall, up to 1 m high, glabrous. Leaves linear, broad, 20-60 x 0.8-1.5 cm, with tubercle based hairs on both surfaces, margin scabrid , blades tapering towards the apex; sheaths loose. Ligule reduced to a hairy ring. Panicle lax, branches up to 20 cm long. Spikelets 5-7 mm long, seated on scabrid pedicels, often

in pairs. Lower glumes ovate, scabrid on the keels, 3-nerved; upper glumes 6 mm long, glabrous, 5-nerved. Lower florets male; lemma 5-7-nerved, glabrous. Palea lanceolate, hyaline. Stamens 3, anthers yellow. Upper florets hermaphrodite, bearded on the callus: lemma 4 mm long, 5-nerved, awn geniculate, 7-8 mm long. Styles 2, stigmas plumose.

Frequent in fallows and forest margins.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1049 Shillong.

Arundo Linn.

Arundo donax Linn. Sp. Pl. 81. 1753; Hook.f. Fl. Brit. India 7: 302. 1896; Bor in Fl. Assam 5: 89. 1940 et Grass. Burm. Ceyl. Ind. Pak. 413. 1960; Babu Herb. Fl. Dehra Dun 587. 1977.

Vern.-' Pungkhar ' (K).

Rhizomes prostrate. Culms erect, tufted, tall, 4-6 m high, jointed, cylindric, fistular. Leaves broad, ovate-lanceolate, acute, 20-60 x 2-8 cm, upper surface rough, margin scabrid or spinulose; sheaths loose, striate, glabrous. Ligules rounded, hyaline, membranous. Panicles terminal, decompound plumose, 20-80 x 10-15 cm, white cottony when dry. Axis striate, stout, jointed. Pedicels 2-8 mm long, scabrid, swollen at the top. Spikelets linear, 0.5-1 cm long, 2-8-flowered. Glumes linear, 1 cm long, acute, 3-nerved, jointed at the apex. Lemmas as long as glumes, callus bearded. Palea shorter than the lemmas. Lodicules 2, ovate. Stamens 3. Styles with feathery stigmas.

A common hedge plant. The culms are used for fencing and in making mats and hats after spliting open.

Fls. & Frts. : October to February.

Specimens examined : Myrthong 1066 Shillong.

Avena Linn.

Avena sativa Linn. Sp. Pl. 79. 1753; Hook.f. Fl. Brit. India 7: 275. 1896; Bor in Fl. Assam 5: 130. 1940 et Grass. Burm. Ceyl. Ind. Pak. 434. 1960.

Annuals. Culms glabrous, Leaves glabrous, shining, 30-50 x 1-1.5 cm, acute; sheaths loose, glabrous, striate. Ligule membranous. Panicles spreading. Spikelets elongate, 3 cm long, acute. Rhachis scabrid on the keels. Pedicels short, glabrous or scabrid, swollen at the tip. Glumes broadly lanceolate, cymbiform, 10-nerved. Lower florets awned; upper florets awnless. Lemmas stout, 6-nerved, 2 cm long. Palea linear, with a row of hairs on one margin; stamens 3, with pendulous anthers. Ovary villous all over, with longitudinal groove. Stigmas plumose.

Cultivated in fields for their grains.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1851 Upper Shillong.

Axonopus P. Beauv.

Axonopus compressus (Sw.) P. Beauv. Ess. Agrost. 12, 154, 167. 1812; Bor in Fl. Assam 5: 269. 1940 et Grass. Burm. Ceyl. Ind. Pak. 278. 1960; Babu Herb. Fl. Dehra Dun 587. 1977. - - Milium compressum Sw. Prodr. 24. 1788 (Plate 37).

Rootstock prostrate. Culms 20-40 cm long, glabrous. Leaves 3-15 x 0.5-1 cm, obtuse, base rounded. Radical leaves dense; sheaths

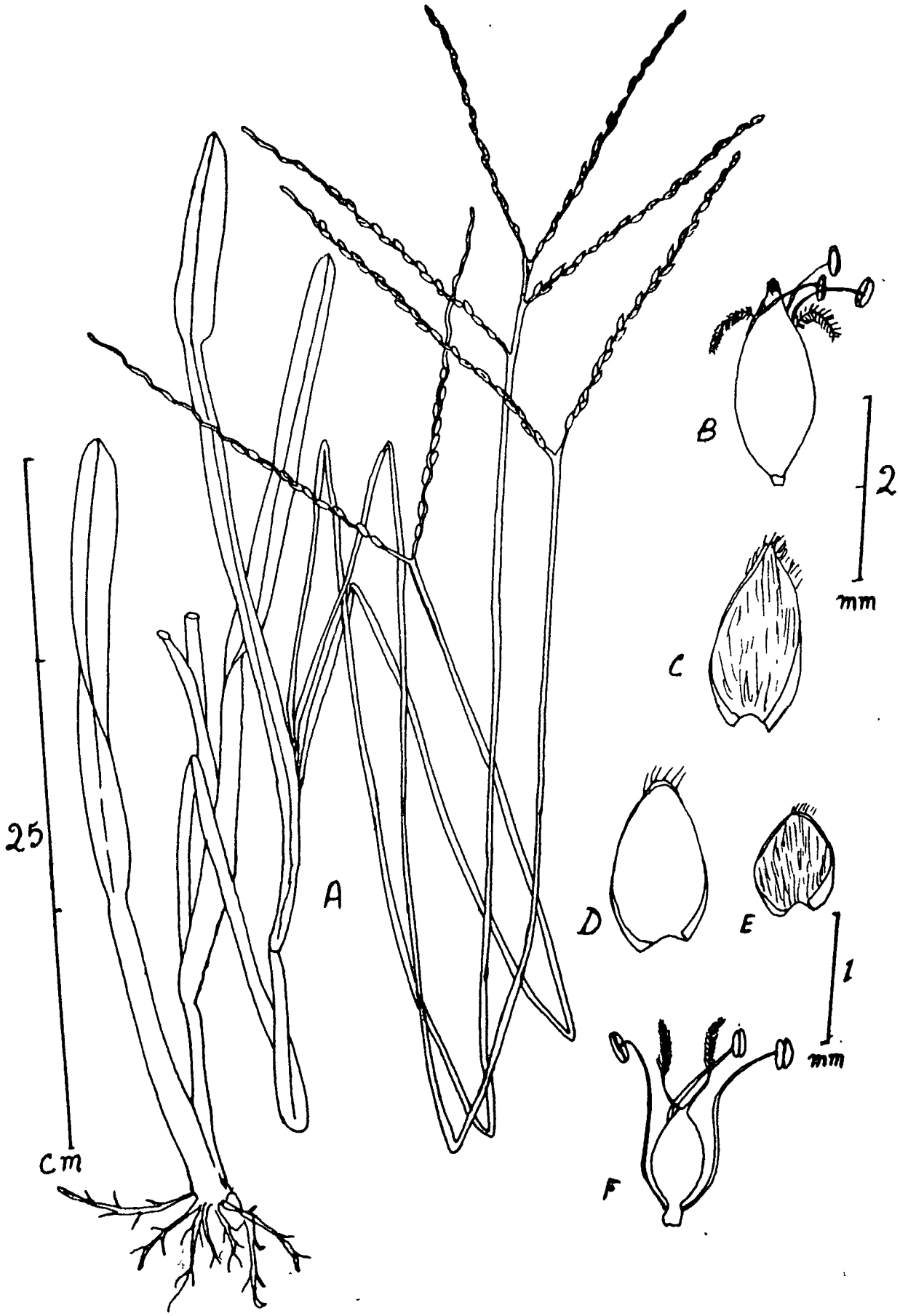


Plate 37 Axonopus compressus (Sw.) P. Beauv. A. Habit, B. Spikelet, C. Glume, D. Lemma, E. Lodicule, F. Pistil with Androecium.

hairy. Ligules membranous . Inflorescence a digitate of 2-4 racemes, Spikelets compressed, sessile, deciduous, finely arranged on the rhachis, tip pink. Lower glumes shining, cymbiform with tufts of hairs ; upper glumes similar to lower one. Lemma hoary white. Stamens 3, anthers brown. Styles 2, stigmas feathery.

Common in the open areas both in low and high elevations specially in abandoned cultivated fields.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1008, 1861 Shillong; 1416 Tura (Garo Hills); 1645 Jowai (Jaintia Hills).

Bambusa Schreber.

Arborescent or shrubby or rarely climbing bamboos. Culms terete, usually tufted, jointed with hollow internodes, developing from thich rhizomes. Culms sheaths broad, auriculate. Leaves not square netted by transverse veinlets, sometimes pellucid punctate. Inflorescence a large leafless compound panicle. Spikelets many-flowered, rarely few-flowered. Glumes 1-3; lemmas ovate-lanceolate, usually mucronate, many-nerved; paleas 2-3, 2-keeled; lodicules 3, obtuse. Stamens 6; filaments free, exserted; anthers narrow, tip obtuse or apiculate. Ovary oblong or obovate. Caryopsis oblong or linear, acute or obtuse, furrowed on one side; pericarp thin adherent; embryo conspicuous.

K E Y T O S P E C I E S

1a. Culms without spines; culm-sheath with rounded auricle, provided with dense black hairs. . . pallida

1b. Culms with spikes; culm-sheath with small auricle, densely covered by golden hairs. . . bambos

Bambusa bambos (Linn.) Voss in Vilmorin Blumengarten 1: 1189. 1896. - - B. arundinaceae auct. non Willd. Sp. Pl. 2: 245. 1799; Gamble in Hook.f. Fl. Brit. India 7: 245. 1896; Bor in Fl. Assam 5: 34. 1940; Babu Herb. Fl. Dehra Dun 588. 1977.

Vern.- ' Siej ' (K).

Tall bamboos, growing in clumps . Culms yellow, jointed, 6-10 m high, spiny at the nodes. Leaves linear, lanceolate up to 20 x 3 cm, apex pointed, base attenuate into a short petiole; sheaths coriaceous, pale yellow with dense silvery hairs. Inflorescence a large panicle, branches verticellate, spicate on short jointed rhachis. Spikelets densely clustered at nodes of the branchlets, 4-7-flowered, compressed, acute, slightly hairy on margin. Glumes ovate-lanceolate, acute, many-nerved, straw coloured, margin slightly hairy . Lemmas broad , cymbiform. Palea linear, ciliate; lodicules very short, obtuse. Stamens 6; anthers linear, 2-celled, attached at the base by a flat membranous filament, apex paniculate. Styles 2, stigmas short, feathery.

Gregarious, in lower elavation.

Fls. & Frts. : March to June.

Specimens examined: Myrthong 3117 Agarobadha (Garo Hills).

Bambusa pallida Munro in Trans. Linn. Soc. 26: 97. 1868; Gamble in Hook.f. Fl. Brit. India 7: 389. 1897; Bor in Fl. Assam 5: 30. 1940.

Vern.-' Siej-rngai ' (K).

Gregarious bamboos. Culms erect, tall 10-15 m high, glabrous when young. Culm-sheath straw-coloured, glabrous. Leaves lanceolate, 10-20 x 2-4 cm, apex twisted into a sharp setaceous point, base rounded or attennuated into a short petiole, blades with few scattered hairs. Ligule a short membrane. Inflorescence a branched panicle; spikelets few to many in spicate heads, on branches, heads with many sterile and fertile spikelets; fertile spikelets 2 cm long, linear-lanceolate, acute. Glumes ovate, acute; lemmas similar to glumes, Palea very short, ciliate on margins. Lodicules fimbriate. Stamens 6; anthers 4 mm long. Styles long, with feathery stigmas.

Abundantly in lower elevations , in deep and secondary forests.

Fls. & Frts. : October.

Specimens examined: Myrthong 1270 Sohkha (Jaintia Hills).

Bothriochloa O. Kuntze

Perennial grasses with branched or simple stems. Leaves linear-lanceolate, narrow. Racemes shortly peduncled, semidigitate, or often a spike, few to several in number in a terminal panicle. Spikelets 2-nate, one sessile and the other pedicelled, similar in shape or the pedicelled ones reduced. Sessile spikelets dorsally compressed; joints and pedicels longitudinally grooved and hyaline, disarticulating horizontally; sessile and pedicelled spikelets deciduous and rhachis very fragile. Sessile spikelets awned, 2-flowered, lower floret reduced to lemma and the upper one hermaphrodite; pedicelled spikelets 1-2-flowered, awnless; lower floret male or neuter and the upper floret neuter or supp-

ressed. Glumes equal, thinly chartaceous, usually with a pit or cavity. Lower lemma nerveless, awned; upper lemma small, awned. Lodicules 2, minute. Stamens 3. Stigmas exserted. Caryopsis oblong, dorsally compressed.

K E Y T O S P E C I E S

1a. Primary axis elongated, longer than the lowest raceme; lower glume with a distinct pit . . . . . intermedia

1b. Primary axis not elongated; lowest raceme longer than the raxis; lower glume with or without a pit. . . . . pertusa

Bothriochloa intermedia (R.Br.) A.Camus in Ann. Soc. Linn. Lyon. 1930, n.s. 76, 164. 1931; Bor in Fl. Assam 5: 368. 1940 et Grass. Burm. Ceyl. Ind. Pak. 108. 1960. - - Andropogon intermedius R.Br. in Prodr. 202. 1810; Hook.f. Fl. Brit. India 7: 524. 1896.

var. punctatum (Roxb.) Keng Clav. Gram. Prim. Sin. 224. 1957.

Roots woody with thick sheaths. Culms 20-80 cm high, with few nodes and internodes, glabrous. Leaves linear, tomentose, ending in a long setaceous tip, with many tubercle-based hairs; blades 15-40 x 0.5-1 cm. Panicle 5-20 cm long. Upper racemes much longer than the lower ones. Axis elongate, longer than the lowest raceme. with hyaline grooves, glabrous. Spikelets elongated with tufted hairs at the base. Pedicels 2-3 mm long, cilate. Glumes equal, lower truncate with a pit in the middle; upper glume lanceolate, 3-nerved, keels scabrid upwards. Lemmas oblong, hyaline, awned; awn 1-1.5 cm long. Palea green , absent in the upper floret. Lodi-

cules 2. Stamens 3; anthers pendulous. Styles 2, stigmas plumose, brown. Caryopsis elongate, acute.

Common in forest cleared areas and under pine forests.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1134 Shillong (Khasi Hills); 1957 Songsak (Garo Hills).

Bothriochloa pertusa (Linn.) A.Camus in Ann. Soc. Linn. Lyon. 1930 n.s. 76. 164. 1931; Bor in Fl. Assam 5: 368. 1940 et Grass. Burm. Ceyl. Ind. Pak. 109. 1960; Babu Herb. Fl. Dehra Dun 590. 1977. - - Holcus pertusus Linn. Mant. Alt. 301. 1771. - - Andropogon pertusus Willd. Sp. Pl. 4: 922. 1806; Hook.f. Fl. Brit. India 7: 173. 1896.

Rhizomes short. Culms prostrate, rooting at lower nodes, terete, glabrous, branched at the upper half. Leaves linear, tapering towards the apex, dorsal surface hairy, margin scabrid; leafblades 15-20 x 0.3-0.5 cm; sheaths hirsute. Ligule a truncate membrane , 4 mm long. Racemes subdigitate, 4-7 cm long, dull purple, silky villous. Sessile spikelets oblong, pale greenish, callus bearded. Glumes equal, truncate, hairy below; lemma awned, 1-1.5 cm long. Stamens 3. Carpels 2.

Frequent in lower altitudes in fallows.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 3073 Burnihat (Khasi Hills).

Brachiaria Griseb.

Annual or perennial grasses. Culms creeping, usually rooting at nodes. Leaves linear or linear-lanceolate. Ligules

ciliate or ciliolate. Racemes subsessile on a common axis. Spikelets oblong or ovate, 2-flowered, awnless, 1-2-nate, on a flat or triquetrous rhachis. Glumes unequal, basal one often adpressed to the rhachis; upper ones much longer than the lower, 5-7-nerved. Lemmas 5-7-nerved; lower floret male with well developed palea; lemma usually 5-(rarely 7-) nerved. Upper florets hermaphrodite, lemma oblong or elliptic, crustaceous or subcoriaceous, 5-nerved; palea 2-keeled. Lodicules 2. Stamens 3. Stigmas laterally exserted at the top of the spikelet. Caryopsis tightly enclosed by the lemma and palea.

K E Y T O S P E C I E S

1a. Spikelets on distinct, elongated, unbranched racemes, developing from a common axis . . distachya
1b. Spikelets on branched, indistinct racemes.
  2a. Spikelets 1.25-2.5 mm long; elliptic, tapering to both ends.. . . . . villosa
  2b. Spikelets 2.5-3 mm long; broadly elliptic oblong. . . . . ramosa

Brachiaria distachya (Linn.) Stapf in Fl. Trop. Afr. 9: 565. 1919; Bor in Fl. Assam 5: 281. 1940 et Grass. Burm. Ceyl. Ind. Pak. 281. 1960. - - Panicum distachyon Linn. Mant. Alt. 183. 1771; Hook.f. Fl. Brit. India 7: 37. 1896.

Perennials. Culms prostrate, rooting in the lower nodes, 10-50 cm high, glabrous. Leaves 1-8 x 0.2-1 cm, acute, glabrous with tubercle-based hairs on the upper surface; sheaths with a row of hispidous hairs. Ligules membranous. Spikes few, arranged alternately on the axis. Spikelets arranged compactly or loosely

on the rhachis. Rhachilla angular with ciliate angles. Spikelets elliptic, obovate, 2-3 mm long. Lower glumes broad, clasping at the base of the spikelets, 1-2 mm long, 5-nerved, margin hyaline. Upper glumes as long as the spikelets, 7-nerved, glabrous. Lemmas similar to the upper glumes, 5-nerved, awnless. Stamens 3. Stigmas violet. Caryopsis compressed.

Common both in forests and in open fallows.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1430 Lailad; 1371 Burnihat (Khasi Hills); 1733 Tura (Garo Hills).

Brachiaria ramosa (Linn.) Stapf in Fl. Trop. Afr. 9: 542. 1919; Bor in Fl. Assam 5: 277. 1940 et Grass. Burm. Ceyl. Ind. Pak. 284. 1960; Babu Herb. Fl. Dehra Dun 591. 1977. - - Panicum ramosum Linn. Mant. Pl. 1: 29. 1767; Hook.f. Fl. Brit. India 7: 36. 1896.

Annuals. Culms 30-80 cm high, geniculate, ascending from prostrate and rooting base, branched, glabrous, channelled. Leaves lanceolate, base rounded, apex acuminate, 5-12 x 0.6-1.5 cm, glabrous; margin scabrid. Panicle contracted or spreading, 5-12 cm long, main axis angular, scabrid, rhachilla angular, scabrid. Spikelets sub-globose, expanded in the middle, sessile or pedicelled, 2-3 mm long. Lower glumes broad, clasping the base of the spikelets; upper glumes equal to the spikelet, 5-7-nerved, obovate. Lemma 5-nerved. Palea hyaline, shorter than the spikelets. Stamens 3. Styles 2. Caryopsis compressed on one side.

Abundant in the lower elevations both in open and shaded areas, specially in abandoned fields.

Plate 38 Brachiaria villosa (Lamk) A.Camus A.Habit, B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lower Lemma, F.Upper Lemma, G.Palea, H.Pistil.

Fls. & Frts.: August to January.

Specimens examined: Myrthong 1729 Burnihat (Khasi Hills) 1915 Tasak (Garo Hills).

Brachiaria villosa (Lamk.) A. Camus in Lecomte Fl. Gen. de Indo-Chine 7: 433. 1922; Bor in Fl. Assam 5: 275. 1940 et Grass. Burm. Ceyl. Ind. Pak. 286. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 354. 1966. - - Panicum villosum Lamk. Encucl. Meth. Bot. 1: 1791 (in part); Hook.f. Fl. Brit. India 7: 34. 1896(Plate 38).

Annuals. Culms 10-40 cm high, rooting at lower nodes, branched. Leaves ovate lanceolate, rounded at base, villous, margin scabrid, blade 1-4 x 0.3-1.5 cm; ligule a ring of hairs. Panicle oblong, racemes 3-6 cm long. Spikelets 2-nate, sessile, subglobose, 1-2 mm long. Lower glumes orbicular less than 1 mm, upper glumes 3-nerved, scabrid on the margin, 2 mm long; lemmas 5-nerved as long as the spikelet; palea hyaline, keeled. Stamens 3; styles 2, stigmas violet. Caryopsis compressed on one side.

Common in moist, shady places both in forests and fallows.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1075 Shillong; 1819 Burnihat (Khasi Hills); 1928 Tura (Garo Hills); 3015 Sutnga (Jaintia Hills).

Brachypodium P. Beauv.

Brachypodium sylvaticum (Huds.) P. Beauv. Ess. Agrost. 101; 155. 1812; Hook.f. Fl. Brit. India 7: 362. 1896; Bor in Fl. Assam 5: 63. 1940 et Grass. Burm. Ceyl. Ind. Pak. 450. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 354. 1966; Babu Herb. Fl. Dehra Dun 591. 1977. - - Festuca sylvatica Huds. Fl. Argl. 1: 38. 1762.

Annuals. Culms tall wiry, glabrous, hairy at nodes, 20-80 cm long. Leaves linear lanceolate scabrid, tapering to a fine point, 10-20 x 0.5-1 cm; sheaths loose, striate, glabrous or sometimes villous. Ligule membranous. Panicles of false racemes, few to many spikelets. Spikelets cylindric, sessile or shortly pedicelled, flat or compressed at maturity. Lower glumes 3-5 mm long, broader at base, 5-nerved, tapering towards the blunt point, upper glumes longer than the lower ones, 7-nerved. Lemmas broad, 6-8 mm long, 7-nerved, awn long from the truncate tip, scabrid, 8 mm long. Stamens 3. Styles 2, stigmas plumose.

Grows mostly in fences and along ditched, drains, banks of streams etc.

Fls. & Frts.: June to December.

Specimens examined: Myrthong 1054 Shillong; 1657 Upper Shillong.

Bromus Dill ex Linn.

Bromus uniloides H. B. & K. Nov. Gen. et Sp. 1: 151. 1815; Hook.f. Fl. Brit. India 7: 357. 1896; Bor in Fl. Assam 5: 78. 1940 et Grass. Burm. Ceyl. Ind. Pak. 456. 1960.

Annuals. Culms geniculate 20-60 cm long; leaves linear, tapering towards the apex, blade 4-40 x 0.4-0.6 cm. Inflorescence lax, rhachis angular, scabrid, branches bearing a single terminal spikelets; spikelets ovate or ovate-lanceolate, laterally compressed, 4-10 flowered, 2-3 cm long, acute. Lower glumes lanceolate, 5-6-nerved, margin scabrid; upper glumes 1-1.2 cm long 9-nerved, tip truncate, keels scabrid. Lemmas 1-1.5 cm long, broadly lanceolate, 11-13-nerved, scarious on the keels, scabrid on the nerves of the dorsal side. Palea 0.4-1 cm long, 2-keeled. Stamens 3, small, 5 mm long. Styles 2, stigmas feathery.

Frequent along roadsides and ditches.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1535 Shillong (Khasi Hills).

Calamagrostis Adans.

Calamagrostis griffithiana Hook.f. Fl. Brit. India 7: 263. 1896; Bor in Fl. Assam 5: 147. 1940. - - Agrostis griffithiana Bor Grass. Burm. Ceyl. Ind. Pak. 387. 1960.

Culms stout, solitary, 1-2 m high, terete, glabrous and shining. Leaves linear-lanceolate, subcoriaceous, 10-20 x 0.4-0.5 cm, glabrous; sheaths loose, striate, ligule truncate, scaberulous, 4 mm long. Panicles 5-15 cm long, decompound; branches and branchlets suberect, capillary, glabrous, naked. Spikelets green, 3-4 mm long. Lower glumes as long as the spikelets, 1-nerved, scabrid on the keels; upper glumes similar to the lower but longer, lemmas ovate, truncate, 4-5-nerved, hairy all over on the back, bristly at the apex; callus hairs very short; awned near the base of the median nerve; palea equalling the lemma, hyaline, obtuse, 2-nerved. Stamens 3; anthers very long, up to 1 mm long, linear. Stigmas usually enclosed by the lemmas or shortly exserted.

Common in open areas, grasslands, and in fallows.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 3251 Nongkrem (Khasi Hills).

Capillipedium Stapf

Annual or perennial grasses. Culms simple or copiously branched. Leaves linear, with a conspicuous, white midrib. Panicles delicate, profusely branched. Branches and pedicels longitudinally furrowed. Spikelets 2-nate, deciduous, one sessile, awned and the other pedicelled, awnless, in 1-2 jointed racemes,

disarticulating horizontally; sessile spikelets apparently 1-flowered, dorsally compressed, callus shortly bearded. Glumes equal, lower lemma hyaline, awnless, upper lemma terminating in a slender awn. Palea 0. Lodicules 2. Stamens 3. Stigma laterally exserted, much longer than style. Caryopsis ellipsoid.

K E Y T O S P E C I E S

1a. Lower glumes of sessile spikelets dorsally channelled; base of leaf-blade not narrowed; spikelets oblong, obtuse . . . . . parviflora

1b. Lower glumes of sessile spikelets flat; leaf-blade narrowed; spikelets lanceolate . . . . . assimile

Capillipedium assimile (Steud.) A. Camus in Lecomte. Fl. Gen. Indo-chine 7: 31. 1922; Bor in Fl. Assam 5: 363. 1940 et Grass. Burm. Ceyl. Ind. Pak. 110. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 354. 1966; Jain in Rec. bot. Surv. India 20(2): 234. 1973; Babu Herb. Fl. Dehra Dun 592. 1977. - - Andropogon assimilis Steud. in Zoll. Syst. Verz. 58. 1854; Hook.f. Fl. Brit. India 7: 179. 1896 (Plate 39).

Perennials. Culms tall 1-2 m high, suffrutescent, rooting at basal nodes, branches slender flattened on one side, nodes

Plate 39 Capillipedium assimile (Steud.) A.Camus A.Portion of the Stem, B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lemma, F.Palea, G.Lodicule, H.Stamens, I.Gynoecium.

with a ring of hairs. Leaves 10-15 x 0.5-0.8 cm, linear, pointed at the tip, sparsely hairy on the dorsal face. Ligule a ring of cilia. Panicles decompound, 5-20 cm long, axis slender, glabrous branches and branchlets capillary, spreading at right angles at anthesis, bearded in the axils. Rhachis fragile. Pedicelled spikelets either male or neuter. Sessile spikelets linear, all hermaphrodite, dorsally compressed. Lower glumes membranous, 2-keeled, very narrowly truncate, ciliate on the keels; upper glumes 2-4 mm long, broadly lanceolate and cilate at the tip, 3-nerved. Lower florets barren. Lemmas hyaline, nerveless. Upper florets hermaphrodite; lemmas long, narrowed, awned. Stamens 3, anthers stout. Styles 2, stigmas feathery.

Common in shady places, both in broad-leaved forests and in pine forests.

Fls. & Frts. : August to March.

Specimens examined: Myrthong 1041 Shillong.

Capillipedium parviflora (R. Br.) Stapf in Dyer. Fl. Trop. Afr. 9: 169. 1917; Bor in Fl. Assam 5: 362. 1940 et Grass. Burm. Ceyl. Ind. Pak. 112. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 355. 1966; Babu Herb. Fl. Dehra Dun 592. 1977. - - Holcus parviflorus R. Br. Prodr. 199. 1810.

Perennials. Culms tufted, up to 1 m high, simple or branched, glabrous. Leaves linear, 5-40 x 0.4-0.6 cm, tapering to a fine point, glabrous, scabrid on the margin; sheaths loose,

many nerved; ligule of short tufted hairs. Panicles 8-30 cm long, primary branches 5-6 from the lowest nodes, glabrous, hairy only at the junction. Racemes reduced to one sessile spikelets, and 2-3 pedicelled spikelets; sessile spikelets oblong, 2-4 mm long, lower glumes truncate, 6-8-nerved, scabrid ciliate on the keels upwards; upper glumes similar to lower ones. Lemmas linear, hyaline, awn 1.5-2 cm long. Pedicelled spikelets usually males: stamens 3, anthers elongated. Styles 2, stigmas plumose.

Common in both open and in dense forests.

Fls. & Frts. : August to April.

Specimens examined: Myrthong 1326 Shillong.

Centotheca Desv.

Centotheca lappacea Desv. in Nouv. Bull. Soc. Philom. 2: 189. 1810; et in Journ. Bot. 1: 70. 1813; Hook.f. Fl. Brit. India 7: 332. 1896; Bor in Fl. Assam 5: 59. 1940 et Grass. Burm. Ceyl. Ind. Pak. 457. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 355. 1966.

Perennials. Culms geniculate, 30-100 cm high, glabrous. Leaves ovate-lanceolate, acuminate, narrowed at the base, margin undulate, blade 3-20 x 1.2-2.5 cm . Ligules truncate, membranous. Panicles spreading 5-20 cm long, rhachis scabrid, branches

numerous spreading, disarticulating from the rhachis. Pedicels capillary, unequal, scaberulous. Spikelets oblong or ovate-oblong, 3-7 mm long, 2-4-flowered. Lower glumes oblong-lanceolate, acute or subacute, 3-4 mm long, 3-5-nerved; upper glumes similar to lower glumes; lemmas oblong, acute or obtuse, 5-7-nerved. Palea hyaline, smaller than the lemmas. Stamens 3. Styles 2, short, stigmas feathery.

Common in shady places in bamboo forests and in fallows.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1435 Mawmluh (Khasi Hills); 1440 Tasak (Garo Hills).

Cephalostachyum Munro

Cephalostachyum latifolium Munro in Trans. Linn. Soc. 26: 140. 1868; Gamble in Hook.f. Fl. Brit. India 7: 412. 1896; Bor in Fl. Assam 5: 17. 1940.

Subscandent bamboos. Culms 2-5 m high. Nodes distinct, sheaths striate, pale straw coloured. Leaves 5-30 x 2-4 cm, ovate-lanceolate, acuminate, glabrous, base cuneate or rounded, petioles 2-8 mm long. Inflorescence capitate or globose, single from the leafy branches. Fertile spikelets linear, acuminate 2-2.5 cm long. Glumes lanceoalte, aristate, many-nerved. Lemmas ovate-lanceolate, aristate. Palea membranous, rounded at the tip with tufted hairs. Stamens 6. Styles ending in two plumose stigmas.

Frequent in forests, specially in slop , areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1398 Laitryngew (Khasi Hills).

Chimonobambusa Makino

Chimonobambusa khasiana (Munro) Nakai in Journ. Arn. Arb. 6: 151. 1925; Bor in Fl. Assam 5: 47. 1940. - - Arundinaria khasiana Munro in Trans. Linn. Soc. 26: 30. 1868.

Vern. 'Namlang' or 'Kdait' (K).

Perennial, bushy shrubs. Culms 1-4 m high, tufted, erect, cylindric, jointed, unbranched at the lower nodes. Culm-sheaths straw-coloured, papery, smooth. Leaves lanceolate, 5-15 x 0.6-1.5 cm, glabrous, sparsely scabrid on the margin, Ligule 1-2 mm long. Inflorescence fascicled at nodes. Pedicels glabrous; spikelets 9-12 mm long; lower glumes 4-5 mm long, 3-nerved, margin ciliate; upper as long as the lower ones, 7-nerved, apex ciliate. Lower floret male: lemmas 7 mm long with 7- conspicuous nerved, margin ciliate; palea same in texture as the lemma, lateral nerves obscure. Stamens 3, anthers long, 5 mm long. Lemmas of bisexual florets 6 mm long, apex subaristate, strongly nerved, margin shortly ciliolate; palea hyaline, shorter than the lemma, distinctly nerved. Lodicules smaller than the palea, apex ciliate, 7-nerved.

Stamens 3.

Abundant throughout Meghalaya, specially in slopy and rocky areas. Flowers when the plants are devoid of faliage.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1539 Shillong (Khasi Hills).

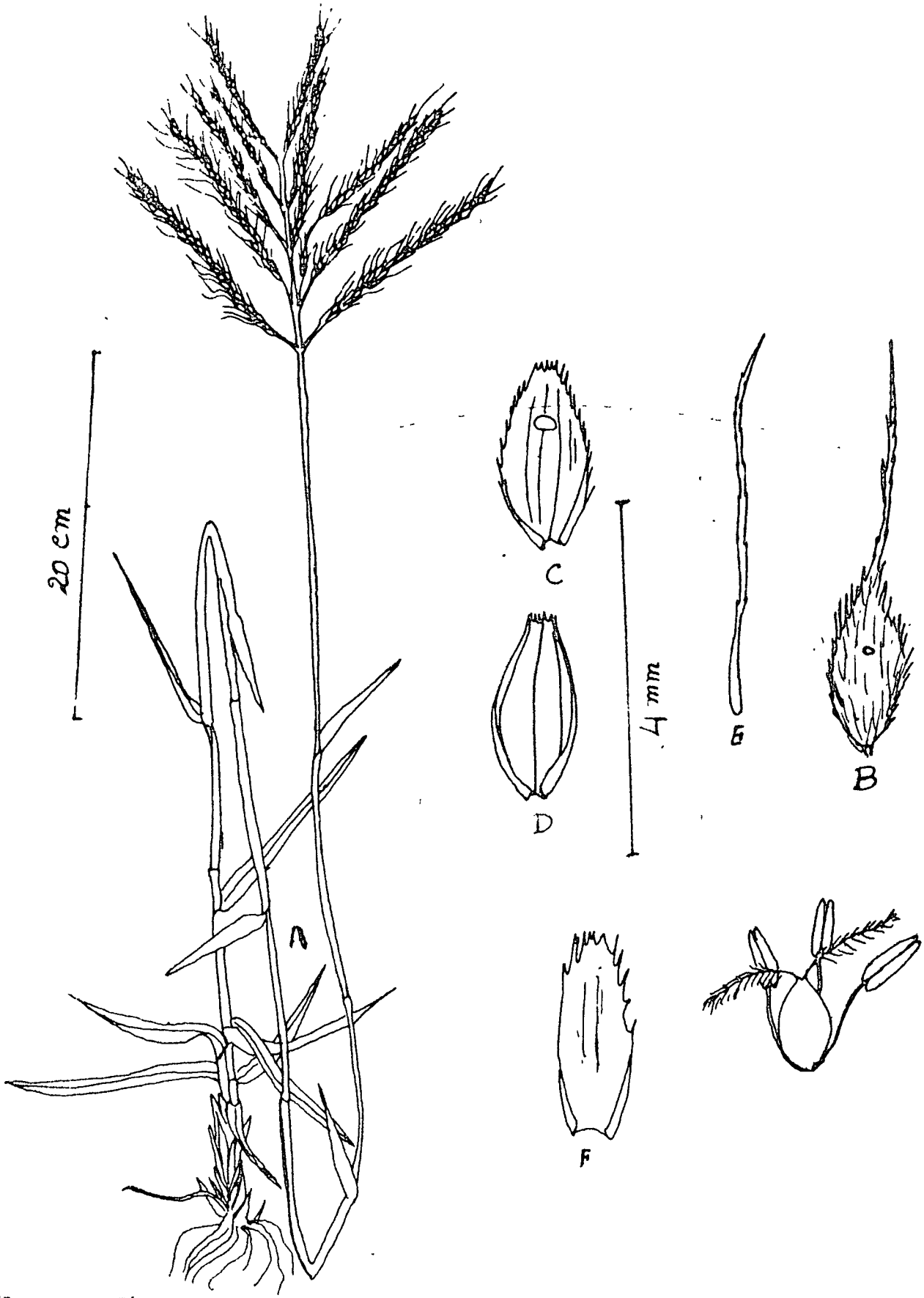
Chrysopogon Trin.

Perennial grasses. Leaves linear, hairy or glabrous. Spikelets usually 3- (rarely 2-) nate, in verticellate whorls in panicle, one sessile and the other pedicelled, falling entire. Florets 2, lower reduced to an empty lemma and the upper hermaphrodite in the sessile and male or neuter in the pedicelled floret. Glumes similar, laterally compressed. Lower lemmas 2-nerved, hyaline; upper lemma 2-cleft with a long geniculate awn in between the cleft. Palea 0 or if present very minute. Lodicules 2, glabrous. Stamens 3. Stigmas exserted laterally. Caryopsis linear, compressed.

K E Y T O S P E C I E S

1a. Leaves tufted, 30-60 cm long, very scabrid all over; spikelets 6-10 mm long. . . gryllus

1b. Leaves short 5-10 cm long, glabrous; spikelets 2-4 mm long . . . . . aciculatus



ate 40 Chrysopogon aciculatus Trin. . A. Habit, B. Spikelet, C. Lov
D. Upper Glume, E. Lower Lemma, F. Upper Lemma, G. Gynoe
Androecium.

Chrysopogon aciculatus (Retz.) Trin. Fund. Agrost. 188. 1820; Bor in Fl. Assam 5: 357. 1940 et Grass. Burm. Ceyl. Ind. Pak. 115. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 355. 1966; Babu Herb. Fl. Dehra Dun 594. 1977. - - Andropogon aciculatus Retz. Obs. Bot 5: 22. 1789; Hookf.f. Fl. Brit. India 7: 188. 1896 (Plate 40).

Rootstock woody, prostrate, culms erect, branched from the lower nodes, glabrous, 10-40 cm high. Leaves radical, base rounded, acute or subacute at apex, margin spinous, sheaths loose, glabrous. Panicle linear or spreading, 5-10 cm long, branches slender, filiform, hairy, articulating obliquely with the hermaphrodite spikelets; spikelets 3-nate, sessile spikelets hermaphrodite and the other two pedicelled, male or neuter. Lower glumes of the sessile spikelets 5 mm long, scabrid, acute, obscurely nerved. Upper glumes as long as the lower ones, shortly articulated, scabrid at the top, margin hyaline; lemmas 2-3 mm long, hyaline. Stamens 3. Styles 2, usually with white feathery stigmas. Caryopsis linear.

Abundant in fields both in open and shaded areas, also along roadsides. Spikelets stick to passing animals and thus get dissiminated.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1307 Pongtung; 1637 Umling (Khasi Hills).

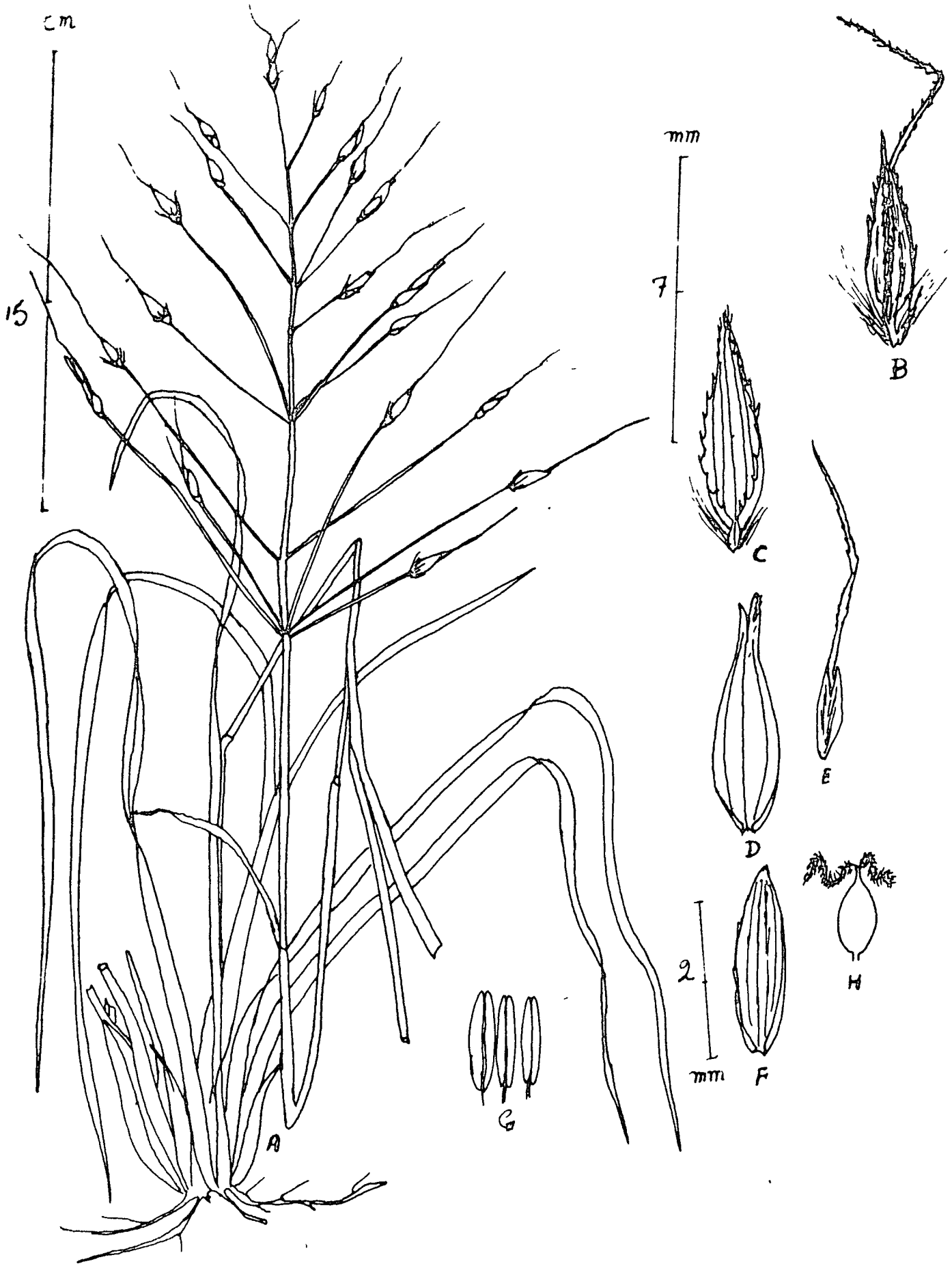


Plate 41 Chrysopogon gryllus (Linn.) Trin. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Stamens, H. Pistil.

Chrysopogon gryllus (Linn.) Trin. Fund. Agrost. 188. 1820; Bor in Fl. Assam 5: 358. 1940 et Grass. Burm. Ceyl. Ind. Pak. 117. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 356. 1966. Andropogon gryllus Linn. Cent. Pl. 2: 33. 1756; Hook. f. Fl. Brit. India 7: 187. 1896 (Plate 41).

Vern.- 'Tonglanglieh' (K).

Perennial densely tufted grasses. Culms obliquely erect, compressed, 0.5-2 m high, glabrous. Leaves long, dense at the base, 10-60 x 0.4-0.8 cm, scabrid on margin; sheaths membranous. Ligules a ring of membrane. Panicles thyrsiform, branches verticellate, spreading, 8-30 cm long, axis angular, scabrid, rhachis 3-5 cm long, filiform, fragile with yellow silvery hairs, bearing 2-3 spikelets. Spikelets elongate, acute, 6-12 mm long, violet brown. Lower florets sessile: lower glumes 7 mm long, margin scabrid, 3-5-nerved; upper glumes as long as or longer than the lower ones. Upper florets as long as the lower, hispid: lemmas membranous, nerveless, awned. Awn twisted, 3-4 mm long, developing from the middle florets. Stamens 3.

Common both in open and shaded areas, very variable with regard to height, depending on the habitats.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1068, 1187 Shillong; 1207 Mawmluh (Khasi Hills); 1220 Sohkha (Jaintia Hills).

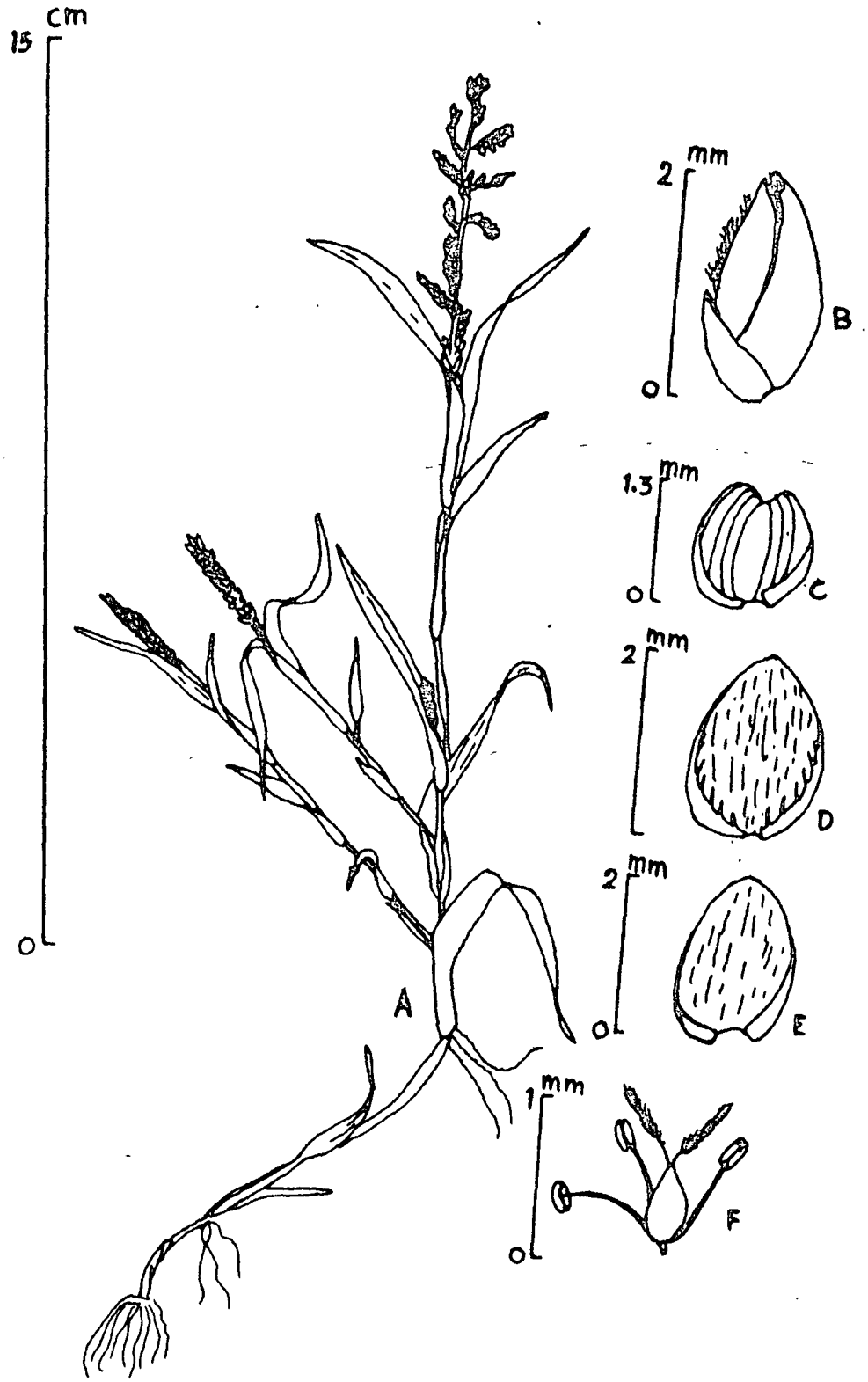


Plate 1/2 Coelachne simpliciuscula Munro A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Pistil with Stamens.

Coelachne R. Br.

Coelachne simpliciuscula Munro ex Benth. in Journ. Linn. Soc. 19: 93. 1881; Bor in Fl. Assam 5: 193. 1940 et Grass. Burm. Ceyl. Ind. Pak. 576. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 356. 1966. - - C. pulchella R. Br. Prodr. 187. 1810 non Hook.f. Fl. Brit. India 7: 270. 1896 (Plate 42).

Vern.-'Batnamlang' (K).

Annuals. Culms weak, 5-30 cm high, branched, nodes bearded. Leaves lanceolate, pointed towards the apex, slightly scabrid, 2-5 x 0.3-0.8 cm. Ligule a ring of hairs. Panicles 5-10 cm long, branches alternate, spike±like racemes, rhachis angular, glabrous. Spikelets violet green, 2 mm long; lower glumes truncate, nerves obscure, as long as the spikelets, upper glumes ovate, obscurely nerved, as long as the lower, membranous with scabrid margin. Lemmas 2 mm long, coriacious; palea equalling the lemmas, hyaline. Stamens 3. Carpels 2. Caryopsis ellipsoid, pointe at both ends.

A weed of marshes and stagnant waters specially in fields.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1165 Shillong (Khasi Hills); Hynniewta 59 Jarain (Jaintia Hills).

Coix Linn.

Coix lacryma-jobi Linn. Sp. Pl. 972. 1753; Hook.f. Fl. Brit. India 7: 100. 1896; Bor in Fl. Assam 5: 453. 1940 et Grass. Burm. Ceyl. Ind. Pak. 264. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 356. 1966; Babu Herb. Fl. Dehra Dun 595. 1977.

Vern.- 'Sohriew' or 'Riewsib' (K).

Culms 1-2 m high; culms rooting at lower nodes, glabrous. Leaves long, strap-shaped, 10-60 cm long, acuminate, margin scabrid; ligule membranous. Panicles drooping, spreading. Spikelets 2-nate, lower glumes ovate, 6-12 x 2 mm, shortly winged from the infolded margin, villous; upper glumes oblong-lanceolate, 9-nerved; lemmas 3-5-nerved, oblong-lanceolate, hyaline. Palea hyaline, 2-keeled. Stamens 3. Female spikelets ovoid, usually from the base of males, lemmas as long as the spikelets, acute. Stigmas feathery. Caryopsis ovoid, shining, white at maturity.

Cultivated in garden for their seeds, used for preparing local drinks.

Fls. & Frts. : October to March.

Specimens examined: Myrthong 1190 Shillong, 1802 Pariong (Khasi Hills); 1287 Sohkha (Jaintia Hills).

Cymbopogon Spreng.

Perennial, aromatic grasses. Leaves linear, coarse with conspicuous white midrib. Inflorescence a decompound or supra-decompound, spatheate panicle. Spikelets 2-nate, each pair differing both in sex and shape, except those of the homogamous lower racemes which are male or neuter, one sessile and the other pedicelled; sessile spikelets 2-flowered, upper floret bisexual, the lower reduced to an empty lemma. Glumes equal or subequal, 1-nerved, keeled upwards; lower lemma ciliate, upper lemma hyaline, 2-nerved. Palea 0. Lodicules 2, glabrous. Stamens 3. Stigmas laterally exserted. Caryopsis oblong, subterete.

K E Y T O S P E C I E S

1a. Sessile spikelets awnless.
  2a. Lower glumes of sessile spikelets 5-6 mm long, concave between the keels, wingless . . citratus
  2b. Lower glumes 4-5 mm long, flat or nearly so, winged above the middle . . . nardus
1b. Sessile spikelets awned.
  3a. Sessile spikelets 5-6 mm long, awn up to 1 cm long; lower glume shallowly concave below the middle, conspicuously nerved . . . . . khasianus
  3b. Sessile spikelets 3-5 mm long; awn less than 1 cm long; lower glumes shallowly depressed, nerveless . . . . . exsertus

Cymbopogon citratus (DC.) Stapf in Kew Bull. 1906: 357. 1906; Bor in Fl. Assam 5: 387. 1940 et Grass. Burm. Ceyl. Ind. Pak. 126. 1960. - - Andropogon ciratus DC. Cat. Hort. Monsp. 70. 1813.

Vern.- 'Langphreit' (K).

Culms tufted, 1-3 m high, glabrous, swollen at nodes. Leaves aromatic, broad 1-1.5 m long, margin scabrid, tapering to a fine point. Sheaths terete, glabrous; ligule short membranous. Inflorescence a leafy panicle, from bract-like leaf. Racemes spreading at right angles, one sessile and the other pedicelled, hairy. Fertile spikelets linear lanceolate, acuminate, glabrous. Lower glumes slightly depressed towards the base, keels flat on the back, acute; upper glumes cymbiform, keeled upwards. Upper florets hermaphrodite: lemmas linear, acute, awnless or with small bristle from the sinus. Anthers 3. Carpels 2, stigmas feathery. Pedicelled spikelets either male or neuter.

Cultivated for extraction of an aromatic oil from leaves and the culms.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1377, 1380 Lailad (Khasi Hills).

Cymbopogon exsertus A. Camus in Rev. Bot. Appl. 1: 237. 1921; Bor in Fl. Assam 5: 391. 1940 et Grass. Burm. Ceyl. Ind. Pak. 127. 1960. - -

Culms 1 m high, glabrous. Leaves 0.5-1 m long, rouogh, margin scabrid, sheaths glabrous, many nerves; ligules membranous 5 mm long. Panicles 30-60 cm long, at the axils of leafy bracts. Spathes 1-2 cm long, ovate-lanceolate, reddish green, acute. Spikelets 4-6 mm long, linear-lanceolate, acute. Lower glumes ovate-lanceolate, glabrous, 2-winged, nerveless, 2-toothed; upper glumes similar to the lower; lemmas broad with ciliate margin; awn up to 1 cm long. Palea hyaline, nerveless. Stamens 3, anthers elongated. Styles 2, stigmas feathery.

Common in open and grassy areas, specially in lower elevations. Used for thatching huts.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1291 Dawki (Jaintia Hills).

Cymbopogon khasianus (Hack.) Stapf ex Bor in Ind. For. Rec. Bot. 1 (3): 92. 1938, Fl. Assam 5: 390. 1940 et Grass. Burm. Ceyl. Ind. Pak. 128. 1960. - - Andopogon nardus var. khasianus (Hack. in DC. Monogr. Phan. 6: 603. 1889; Hook.f. Fl. Brit. India 7: 205. 1896 (Plate 43).

Vern.- 'Langphreit' (K).

Perennials. Culms up to 2 m high, jointed, glabrous, arising from stout rootstocks. Leaves glabrous, margin scabrid, tapering towards a fine point. Sheaths shorter than the internodes, striate. Ligules membranous 2 mm long. Panicles leafy, 30-100 cm long,

Plate 113 Cymbopogon khasianus (Munro) Stapf A. Habit, B. Spikelet, C. Lower Glume, E. Len. ..., F. Palea, G. Lodicule, H. Androecium & Gynoecium.

nodding, contracted or loose. Spathes lanceolate, 1.5-4 cm long, obtuse. Pedicelled spikelets on a short glabrous pedicel. Sessile ones 5 mm long. Lower glumes ovate-lanceolate, glabrous, 2-keeled winged, near the middle, 6-9-nerved, margin inflexed, ciliate; upper glumes cymbiform, 3-nerved. Lemma of lower florets hyaline, nerveless, equalling the upper glumes. Upper florets hermaphrodite, lemma narrow, awn long, geniculate, about 1-1.5 cm long. Palea hyaline, nerveless. Stamens 3, anthers brown. Pedicelled spikelets neuter or males, lower glumes lanceolate, many-nerved, upper glumes ovate, 3-nerved, ciliate; palea cuneate. Style 2, stigmas feathery.

Common in open places as well as under bushes in hedges. Culms used for covering wall of the huts by villagers.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1311 Sokha, 1485 Garumpani (Jaintia Hills).

Cymbopogon nardus (Linn.) Rendle in Cat. Welw. Afr. Pl. 2: 155. 1899; Bor in Fl. Assam 5: 388. 1940 et Grass. Burm. Ceyl. Ind. Pak. 130. 1960;

Vern.-'Langphreit' (K).

Culms slender, compressed below, glabrous. Leaves 30-50 x 0.2-0.5 cm, margin scabrid, sheaths keeled, striate, less than half the length of the internodes. Ligules membranous, obtuse,

2-3 mm long. Panicles leafy, 30-50 cm long, racemes subequal, spathes lanceolate, acute, 2-3 cm long; pedicels villous, sessile spikelets ovate-lanceolate, acute. Lower glumes ovate-lanceolate, keeled, 6-nerved, 2-3 lobed at apex; upper glumes similar to lower glumes. Lemmas nerveless, acute, infolded, margin ciliate; palea hyaline, linear-lanceolate. Stamens 3. Pedicelled spikelets similar to sessile ones. Glumes ovate, many-nerved. Lemma hyaline, equal to the spikelets. Palea hyaline, linear, nerveless stamens 3. Styles 2, stigmas feathery.

Common in grassy areas, both in fields and forests.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1031 Shillong (Khasi Hills); Handique 25 Jowai (Jaintia Hills).

Cynodon Rich.

(1.)

Cynodon dactylon Pers. Syn. 1: 85. 1805; Hook.f. Fl. Brit. India 7: 288. 1896; Bor in Fl. Assam 5: 125. 1940 et Grass. Burm. Cyyl. Ind. Pak. 469. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 357. 1966; Babu Herb. Fl. Dehra Dun 598. 1977 (Plate 44).

Vern.-'Bat-thri' (K).

Creeping and rooting at nodes. Culms procumbent, shining, internodes short. Leaves conspicuously distichous, linear 1-15 x 0.1-0.2 cm, glabrous, subobtuse. Sheaths smooth. Ligules a rim

Plate 44 Cynodon dactylon Pers. A.A portion of plant, B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lemma, F.Palea, G.Gynoecium with Androecium.

of unequal hairs. Inflorescence of 3-5 digitate spikes, 1-6 cm long, rhachis hairy at the base. Spikelets secund in 1-2 rows, 1-2 mm long. Lower glumes as long as the spikelets, 2-keeled with a strong median nerve, scabrid on the dorsal surface; upper glumes larger than the lower ones. Lemmas as long as the spikelets with 2-lateral nerves, ciliate on the keels. Palea shorter than lemma, 3-nerved, keels membranous. Stamens 3. Stigmas 2, pink, feathery. Caryopsis shining.

Abundant in all places, both on hills and in plains, specially in grasslands. A weed of cultivation. A good soil binder.

Fls. & Frts. : February to October.

Specimens examined: Myrtnong 1111 Shillong, 1310 Burnihat, 1594 Pariong (Khasi Hills); 1429 Dawki (Jainti Hills); 1470 Songsak, 1597 Baghmara (Garo Hills).

Cyrtococcum Stapf

Perennials or annuals. Culms prostrate or erect with geniculate base, rooting at nodes. Leaves linear-lanceolate; ligule membranous. Inflorescence a spreading or contracted panicle. Spikelets gibbous, awnless, 2-flowered; lower floret empty, with or without paleas; upper floret hermaphrodite: glumes subequal, lower glumes usually shorter than the upper glumes, 3-5-nerved; lemmas of the upper florets cymbiform, gibbous, coriaceous, obscurely 5-nerved; paleas similar to the lemmas; lodicules

2. Stamens 3. Stigmas shortly exserted. Caryopsis ellipsoid.

K E Y T O S P E C I E S

1a. Panicles contracted, erecto-patent; pedicels very short, as long as spikelets . . . Oxyphyllum

1b. Panicles spreading; pedicels much longer than the spikelets . . . accrescens

Cyrtococcum accrescens (Trin.) Stapf in Hook.f. Icon. Pl. sub. Tab. 3096. 1922; Bor in Fl. Assam 5: 241. 1940 et Grass. Burm. Ceyl. Ind. Pak. 291. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 357. 1966; Babu Herb. Fl. Dehra Dun 598. 1977. - - Panicum accrescens Trin. Sp. Gram. Icon. 1.t. 88. 1828.

Annuals. Culms branched from base, geniculate, rooting at lower nodes, glabrous. Leaves linear-lanceolate, acute, base contracted, glabrous, sometimes with few tubercle based hairs. Sheaths glabrous or slightly hairy. Ligule a short, truncate membrane. Panicles spreading, branches and branchlets capillary, glabrous. Pedicels long, filiform. Spikelets lax, globose, 1-1.5 mm long. Lower glumes 1 mm long, ovate-acute, 3-nerved; upper glumes cymbiform, 3-5-nerved. Lemmas ovate, coriaceous. Palea shining, embracing the grain. Lodicules 2, as long as the grain. Stamens 3. Styles 2, Caryopsis globose.

Abundant in moist shady areas specially along streams and ravines.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1125 Shillong (Khasi Hills); 1280 Sohkha (Jaintia Hills).

Cyrtococcum oxyphyllum (Steud.) Stapf in Hook.f. Icom. Pl. sub. Tab. 3096. 1922; Bor in Fl. Assam 5: 239. 1940 et Grass. Burm. Ceyl. Ind. Pak. 291. 1960. - - Panicum oxyphyllum Steud. Syn. Pl. Glum. 1: 65. 1854.

Annuals or perennials. Culms 20-80 cm long, profusely branched, rooting at the lower nodes, glabrous. Leaves linear-lanceolate, hairy, scabrid on the margin, apex finely acuminate. Sheaths shorter than the internodes; ligules short, truncate. Panicles 4-20 cm long, contracted, rhachis keeled, hairy on the keels. Branches and branchlets capillary, short. Spikelets globose, brown, obliquely obtuse. Lower glumes 1 mm long, 3-nerved obtuse; upper glumes longer than the lower glumes. Lemmas 3-5-nerved. Palea linear-lanceolate, or ovate-lanceolate, cymbiform. Stamens 3. Caryopsis elliptic.

Common in deep forests specially in lower elevation.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1452 Tura peak (Garo Hills); Sherma 158855 Umsaw (Khasi Hills); Deka 13726 Jaintiapur (Jaintia Hills) (ASSAM).

Dactylis Linn.

Dactylis glomerata Linn. Sp. Pl. 1: 71. 1753; Hook.f. Fl. Brit. India 7: 335. 1896; Bor in Fl. Assam 5: 74. 1940 et Grass. Burm. Ceyl. Ind. Pak. 530. 1960.

Culms 40-60 cm high, geniculate or ascending from stout rootstock, glabrous. Leaves crowded at the base, linear, 10-40 x 0.2-0.6 cm, tapering towards the acute point, margin shortly scaberulous . Sheaths loose, striate, shorter than the internodes. Ligule long, truncate, 6-8 mm long, membranous. Panicles terminal with 1-4 distant branches. Axis angled, rough. Spikelets 3-5-flowered, 1 cm long, acute. Lower glumes 5-6 mm long, convex; upper glumes similar to the lower. Lower florets male, sessile, 5-6 mm long: lower glumes hyaline, membranous, 1-nerved, acute, keels scabrid; upper glumes similar to lower. Upper florets shortly pedicelled. Lemmas ovate, 4-5 mm long, 3-nerved, mucronate or awned, ciliate on the dorsal nerves; palea linear, as long as the lemma, obovate, hyaline, with 2-marginal nerves, keels ciliate, 2-toothed. Stamens 3, anthers cuneate, deciduous. Styles 2, stigmas wiry, plumose.

Frequent only as an introduction.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1858 Shillong (Khasi Hills).

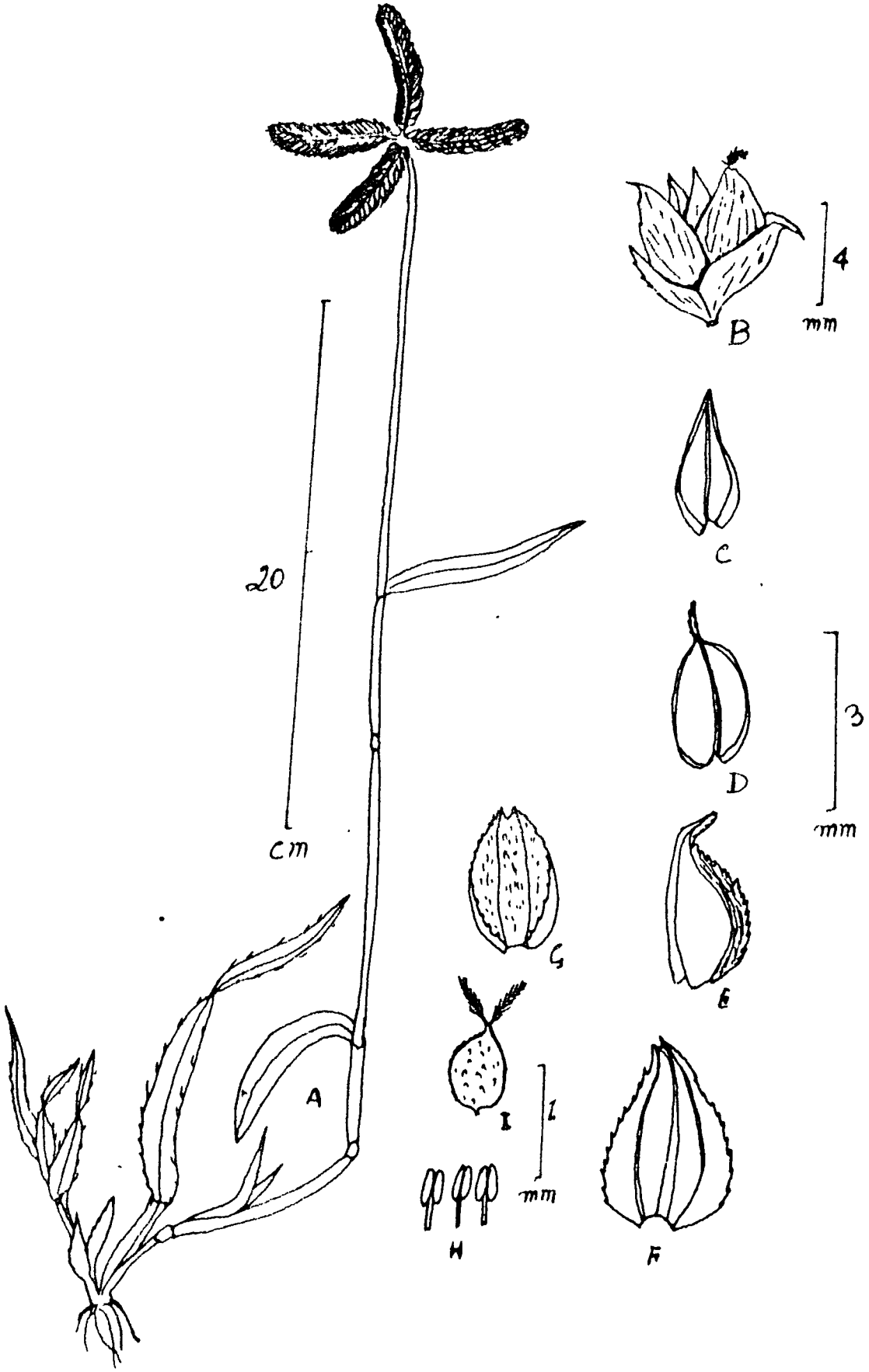


Plate 45 Dactylotenium aegypticum P. Beauv. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Lodicule, H. Stamens, I. Pistil.

Dactyloctenium Willd.

Dactyloctenium aegyptiacum P. Beauv. Ess. Agrost. 72. 1812; Bor in Fl. Assam 5: 110. 1940 et Grass. Burm. Ceyl. Ind. Pak. 162. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 357. 1966; Babu Herb. Fl. Dehra Dun 599. 1977 (Plate 45).

Annuals. Culms erect from a prostrate base, rooting in the lower nodes. Leaves 5-20 x 0.2-0.5 cm, with scattered tubercle based hairs, acute. Sheaths loose; ligules membranous. Inflorescence digitate, racemes 1-4 cm long, ending in a mucro. Spikelets in 4-6-rows. Glumes equal, short, obtuse, mucronate, 1-nerved; lemmas broad, 3-nerved, mucronate. Palea as long as the lemma, 2-keeled, hyaline, ciliate on the margin. Stamens 3, anthers 2 mm long. Styles 2. Caryopsis obovate or globose.

Common in lower elevation. A weed of cultivation and in fallows.

Fls. & Frts. : September to January.

Specimens examined : Myrthong 1719 Burnihat (Khasi Hills); 1923 Baghmara (Garo Hills).

Dendrocalamus Nees

Arborescent bamboos with profusely branched rhizomes. Culms erect with buttress roots in the lower nodes. Leaves not tessellate, Spikelets few to many-flowered; lower floret reduced to an empty lemma, upper florets hermaphrodite, terminal floret rudimentary

or absent. Dasal glumes 2-3, muticous or mucronate; lemmas similar to glumes; paleas 2-keeled, ciliate on the keels; lodicules 0. Stamens 6, free. Stigmas 1-3, subulate. Caryopsis with a crustaceous pericarp.

K E Y T O S P E C I E S

1a. Spikelets few in small heads, many sterile, ovate-acute . . . . . giganteus

1b. Spikelets numerous, in large soft congested heads.

2a. Spikelets acute, culm-sheaths very hairy, fringed . . . . . hookeri

2b. Spikelets obtuse, culm-sheaths glabrous, not fringed . . . . . hamiltonii

Dendrocalamus giganteus Munro in Trans. Linn. Soc. 26: 150. 1868; Gamble in Hook.f. Fl. Brit. India 7: 406. 1896; Bor in Fl. Assam 5: 11. 1940.

Vern.-'Siej-iong' (K).

Tufted bamboos. Culms very tall, up to 40 m high, jointed, basal nodes with a ring of dense stilt roots. Culm-sheaths 20-60 cm long, broader than its length, contracted into a triangular apex, surface covered with dense brown itching hairs. Leaves very long, 20-50 x 8-12 cm, hairy when young, cordate or rounded at base, midrib distinct. Ligule long, truncate, membranous. Panicles large. Spikelets in distant globose heads, ovate-lanceolate, acute, glabrous, many-flowered: lower florets reduced into lemma. Glumes ovate, subacute, striate, many-nerved,

with transverse lines in between the nerves. Lemmas short, ciliate. Paleas ciliate. Stamens 6, anthers 4-6 mm long. Styles long, with feathery stigmas.

Common, forming dense clumps. The culms are extensively used for different purposes, specially in villages.

Fls. & Frts. : Few culms flower in few years.

Specimens examined: Myrthong 1196 Umlyngka (Khasi Hills).

Dendrocalamus hamiltonii Nees et Arn. ex Munro in Trans. Linn. Soc. 26: 151. 1868; Gamble in Hock.f. Fl. Brit. India 7: 405. 1896, Bor in Fl. Assam 5: 9. 1940.

Vern.-'Siejrngai' (K).

Culms erect, caespitose 6-20 m high, curved in the upper portion, branched above. Culm-sheaths long, those of the lower portions, shining, glabrous or with scattered stiff brown hairs. Leaves large, rounded or auriculate at base, apex tapering into a sharp twisted and scabrid point. Ligule long, truncate, clasping the branchlets. Panicles branched; flowers purple on subglobose heads; spikelets purple, glabrous, 6-10 mm long. Glumes short, rounded, many-nerved; lemmas broad, ciliate on margin, many-nerved. Palea ciliate, linear. Stamens 6, anthers purple, exserted. Stigmas 3, coiled or incurved.

Abundant in all types of forests specially in lower elevation.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1543 Lailad (Khasi Hills); Deb 29231 Rongrengiri (Garo Hills) (ASSAM).

Dendrocalamus hookeri Munro in in Trans. Linn. Soc. 26: 151. 1868; Gamble in Hook.f. Fl. Brit. India 7: 405. 1896; Bor in Fl. Assam 5: 8. 1940.

Vern.-'Siejkhlaw' (K).

Tall bamboos. Culms tufted, erect or curved in the upper portion, 10-20 m high, 8-12 cm across, branched above. Culm-sheaths broad, hairy on the upper surface, glabrous and shining below, auriculate at base. Leaves broad, oblong, rounded at the base or attenuate into a short petiole, margin scabrid. Ligule truncate, smooth. Panicles large. Spikelets condensedinto a semi-globose heads. Rhachis whip-like, glaucous or covered with dense adpressed silky hairs. Spikelets 6-10 mm long, truncate or acute. Glumes short, rounded, obtuse, clasping the base of spikelets. Lemmas ovate-lanceolate, many-nerved. Palea ciliate, keels hirsute. Stamens 6, anthers pinkish, with penicellate tips. Styles hairy, stigmas coiled. Caryopsis ovoid, hairy at the top.

Common in forests forming dense clumps. Culms extensively used for different purposes, specially in villages.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 3016 Tasak (Garo Hills); Balakrishnan 47025 Raliang (Jaintia Hills) (ASSAM).

Deyeuxia Clar.

Deyeuxia elatior (Griseb.) Hook.f. Fl. Brit. India 7: 266. 1896; Bor in Fl. Assam 5: 143. 1940 et Grass. Burm. Ceyl. Ind. Pak. 398. 1960. - - Calamagrostis scabrescens var.elatior Griseb. in Goett. Nachr. 79. 1868.

Perennials. Culms erect, 1.5-2 m high, glabrous. Leaves 20-80 x 0.5-1.2 cm, scabrid, apex acute. Sheaths loose, shortly hairy, margin membranous. Ligules membranous, 8 mm long. Panicles 20-40 cm long, branches whorled, ascending, capillary. Spikelets lanceolate, acute, 4-5 mm long, callus with tuft of hairs more than half the lenghh of the spikelets. Pedicels as long as the spikelets, very scabrid. Lower glumes 5 mm long, linear-lanceolate, acute, strongly 1-nerved; upper glumes similar to the lower ones. Lemmas 3-4 mm long, 4-nerved, hyaline, apex erose, awned. Palea hyaline, truncate with cilia on the callus. Stamens 3, anthers elongate. Styles concealed by the base of the anthers.

Frequent in open areas along banks of streams or forest clearing.

Fls. & Frts. : November to January.

Specimens examined: Myrthong 3061 Shillong peak (Khasi Hills).

Dichanthium Willemet

Dichanthium caricosum (Linn.) A. Camus in Bull. Mus. Nat. Hist. Paris 28: 549. 1912; Bor in Fl. Assam 5: 370. 1940 et Grass. Burm. Ceyl. Ind. Pak. 134. 1960. - - Andropogon caricosum

Linn. Sp. Pl. ed. 2, 1480. 1763.

Tufted perennials. Culms branched, geniculate, 30-80 cm high, hairy at nodes or glabrous. Leaves linear, apex setaceous, margin scabrid. Sheaths loose. Ligules membranous. Inflorescence digitate or subdigitate. Racemes solitary or 2-4-nate, silky. Rhachis jointed, fragile. Pedicels hairy, sessile spikelets hermaphrodite, oblong 4-5 mm long. Lower glumes papyraceous, obtuse or subtruncate, 8-12-nerved; upper glumes as long as the spikelets, membranous, papyraceous, depressed near the median keel. Lower florets male or neuter, lemmas hyaline, obtuse, nerveless, awn slender 1.5-2.5 cm long, scabrid, geniculate in the middle. Palea same as the lemma, awnless. Stamens 3. Ovary glabrous, stigmas feathery. Pedicelled spikelets almost similar to sessile one but more hairy.

Frequent in forests.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1442 Tura peak (Garo Hills).

Digitaria Heist.

Annuals or perennials. Culms suberect. Leaves linear-lanceolate, flat. Inflorescence digitate. Spikelets caducous, lanceolate elliptic, dorsally convex. Lower glumes scaly or absent; upper glumes membranous, 3-nerved, rarely 5-nerved, or sometimes 1-nerved. Lemmas as long as the spikelets 5-7-nerved. Palea enclosed

by Gemma. Lodicules 2, cuneate. Stamens 3. Styles free. Caryopsis oblong.

K E Y T O S P E C I E S

1a. Hairs on the spikelets verrucose.
  2a. Culms erect; racemes of 2-6 racemes 4-10 cm long; fruits purplish . . . violascens
  2b. Culms creeping, or procumbent; racemes 2-3, shorter than the above; fruits pale, ... longiflora
1b. Hairs on the spikelets absent or if present, not verrucose.
  3a. Hairs on the spikelets clavate.
    4a. Tips of the pedicels cup-shaped with hairs on the rim and below, hairs overtapping..
      5a. Upper glumes very short or absent; spikelets 1.25 mm long.
        6a. Indumentum of clavate hairs definite . . .stricta.var. stricta
        6b. Indumentum of clavate hairs absent or almost absent . . stricta var. glabrescens
      5b. Upper glumes well developed, at least longer than the above; spikelets 2.25 mm long . . . ternata
    4b. Tip of the pedicels somewhat thickened, glabrous.. . . . . jubata
  3b. Hairs on the spikelets, if present not clavate.
    7a. Spikelets elliptic-lanceolate, 2.5-3 mm long, upper glumes 3-nerved or nerveless, ... ciliaris
    7b. Spikelets elliptic-acute, 2-2.5 mm long; upper glumes 1-nerved or nerveless . . . setigera

Digitaria ciliaris (Retz.) Koel. Descr. Gram. 27. 1802; Veldkamp in Blumea 21: 32. 1973. - - Panicum ciliare Retz. Obs. 4: 16. 1786. - - Digitaria adscendens (H.B. & K.) Henr. in Blumea 1: 92. 1934; Bor in Fl. Assam 5: 204. 1940 et Grass. Burm. Ceyl. Ind. Pak. 298. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 358. 1966; Babu Herb. Fl. Dehra Dun 603. 1977. - - Panicum adscendens H.B.& K. Nov. Gen. et Sp. Pl. 1: 97. 1816.

Annuals. Culms suberect from a geniculate base, 10-60 cm high, rooting in the lower nodes. Leaves linear, rounded at base, tapering towards the apex, 5-16 x 0.5-1 cm, glabrous, or with few tubercle based hairs. Sheaths loose, glabrous or with few scattered tubercle based hairs, margin cartilaginous. Ligules membranous, truncate. Inflorescence subdigitate, of 4-9 racemes. Racemes 5-15 cm long, rhachis winged, scabrid. Spikelets compressed, 2-nate, one sessile and the other pedicelled, 1-2 mm long, scabrid. Upper florets hermaphrodite. Lower glumes ovate, obtuse, 3-nerved. Lower florets sessile. Lemma membranous 5-7-nerved. Palea chartaceous. Stamens 3. Styles 2. Caryopsis plano-convex.

Common weed throughout Meghalaya.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1135 Shillong (Khasi Hills); 1404 Baghmara, 1471 Tura (Garo Hills).

Digitaria jubata (Griseb.) Henr. in Blumea 1: 84. 1868; Bor in Fl. Assam 5: 207. 1940 et Grass. Burm. Ceyl. Ind. Pak. 302. 1960. - - Paspalum jubatum Griseb. in Nachr. Kon. Ges. Wiss Univ. Gott. 84. 1868; Hook.f. Fl. Brit. India 7: 19. 1896.

Annuals. Culms prostrate or erect, rooting from the geniculate base. Leaves linear-lanceolate, tapering towards the apex, 10-20 cm long, glabrous or very hairy. Ligules membranous, 2-4 mm long, truncate. Inflorescence digitate or whorled, many racemes. Rhachis undulate, angular, scabrid on the keels. Spikelets secund, 1-2 mm long, obovate, or elliptic, 1-2-nate. One sessile and the other pedicelled. Lower glumes absent, upper glumes as long as the spikelets, acute, obscurely nerved. Lower floret barren: Lemma membranous, 3-5-nerved, ciliate on margin. Upper florets hermaphrodite: lemma acute, palea similar to the lemma, margin infolded. Stamens 3. Styles 2. Stigmas feathery.

Common in wet places specially on drains and fallows.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1338 Shillong (Khasi Hills); 1642 Jowai (Jaintia Hills); 3012 Songsak (Garo Hills).

Digitaria longiflora (Retz.) Pers. Syn. Pl. 1: 85. 1805; Bor in Fl. Assam 5: 211. 1940 et Grass. Burm. Ceyl. Ind. Pak. 302. 1960; Veldkamp in Blumea 21: 66. 1973; Babu Herb. Fl. Dehra Dun 605. 1977. - - Panicum longiflorum Retz. Obs. 4: 15. 1786; Hook.f. Fl. Brit. India 7: 17. 1897.

Annuals. Culms erect from prostrate base, branched in the lower nodes. Leaves linear-lanceolate, tapering towards the fine point, glabrous, margin scabrid. Sheaths glabrous or with few scattered hairs, ligules membranous 1 mm long. Inflorescence of 2-3 racemes, 2-8 cm long, rhachis straight, flat, scabrid on the keels. Spikelets 2-3-nate, 1.5-2 mm long, acute. Lower glume absent. Upper glume ovate, 3-5-nerved, pubescent. Lower floret: lemma hyaline as long as the spikelets, 5-7-nerved, slate-coloured. Upper floret: lemma same as that of lower floret. Palea similar to the lemma. Stamens 3. Styles 2, stigmas feathery. Caryopsis compressed, shining.

Common both in the hills and in plains. A weed of paddy fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1229 Mawsmai (Khasi Hills); 1451 Tura (Garo Hills); 1598 Jowai (Jaintia Hills).

Digitaria setigera Roth ex R. & S. Syst. Veg. 2: 474. 1817; Bor Grass. Burm. Ceyl. Ind. Pak. 305. 1960; Veldkamp in Blumea 21: 37. 1973. - - D. pruriens Buse in Miq. Pl. Jungh. 379. 1854; Bor in Fl. Assam 5: 205. 1940.

Annuals. Culms suberect, geniculate at base. Internodes swollen at nodes. Leaves linear-lanceolate, tapering towards the apex; blades 3-15 x 0.3-0.5 cm, glabrous or hairy near the mouth; sheaths loose, with tubercle based hairs. Ligules membranous

truncate. Inflorescence subdigitate, or 3-9 racemes. Rhachis flexuous, hispid. Spikelets 2-nate, one sessile and the other pedicelled, 2-2.5 mm long, acute. Lower glumes small or absent. Upper glumes 1-2 mm long, ciliate on margin, 3-nerved. Lemmas broad, as long as the spikelets, 5-7-nerved. Palea and lodicules not seen in our specimens. Stamens 3. Styles 2, laterally exserted, stigmas feathery.

A weed of cultivation and marshes.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1426 Baghmara, 1471 Tura (Garo Hills).

Digitaria stricta Roth ex R. & S. var. glabrescens Bor in Webbia 11: 336. 1955 et Grass. Burm. Ceyl. Ind.Pak. 305. 1960; Babu Herb. Fl. Dehra Dun 606. 1977.

Annuals. Culms erect from geniculate base, 10-50 cm high, glabrous. Leaves oblong-lanceolate, 2-10 x 0.4-0.6 cm, glabrous, or scabrid on margins, apex scabrid, unequal. Sheaths loose, striate. Ligules truncate, membranous. Racemes 2-3, 3-10 cm long. Rhachis winged, slightly scabrid on edges. Spikelets secund. Lower glumes linear, short, densely hairy, 1-nerved; upper glumes hairy, as long as the spikelets, ill developed. Lemmas ovate, rugose, dark yellow, many close nerved. Palea similar to lemmas. Stamens 3. Styles 2, stigmas stout feathery.

Abundant in abandoned cultivated lands and in forest clearings.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1132 Shillong (Khasi Hills).

Digitaria stricta Roth ex R. & S. Syst. Veg. 2: 474. 1817; Bor Grass. Burm. Ceyl. Ind. Pak. 305. 1960; Babu Herb. Fl. Dehra Dun 606. 1977.

Annuals. Culms erect 10-30 cm high, glabrous, branched at base. Leaves linear lanceolate, 2-15 x 0.1-0.6 cm, with few scattered tubercle based hairs, margin shortly scabrid; sheaths loose, sparsely hairy. Ligule truncate. Racemes 2-6, 2-6 cm long; rhachis capillary slightly undulated. Spikelets 2-3-nate, pedicels longer than the spikelets, scabrid, hairy towards the tip. Spikelets 1 mm long, brownish or blackish green, lanceolate-acute, covered with short clavate hairs. Lower glumes reduced to tuft of clavate hairs, upper glumes shorter than the spikelets, densely covered with clavate hairs. Lemmas ovate, infolded, dark yellow, acute, striate or obscurely nerved. Palea similar to lemmas. Stamens 3, anthers short. Styles 2, stigmas shortly exserted, feathery.

Common in pine forest and on rocks.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1133 Shillong (Khasi Hills).

Digitaria ternata (A.Rich.) Stapf ex Dyer Fl. Cap. 7: 376. 1898; Bor in Fl. Assam 5: 209. 1940 et Grass. Burm. Ceyl. Ind. Pak. 306. 1960; Veldkamp in Blumea 21: 59. 1973. - - Cynodon ternatus A. Rich. Tent. Fl. Abyss. 2: 405. 1851.

Annuals. Culms erect, simple 20-50 cm high. Leaves linear broad, acute, 3-10 x 0.2-0.8 cm, glabrous or sparsely hairy, specially towards the base, margin finely scabrid. Sheaths loose, striate, glabrous. Ligules membranous with a few tubercle based hairs on the back or at the base. Inflorescence usually of 2-4 racemes, 4-10 cm long, rhachis winged flat, with scabrid margin Spikelets 2-3-nate, ovate-lanceolate, 2-2.8 mm long, with clavate hairs. Pedicels hairy on the capitate tip. Lower glumes less than 2 mm long with tufts of clavate hairs on margin, distinctly 3-nerved; upper glumes hairy, 5-7-nerved. Lemmas ovate, incurved smaller than the upper glume, brown, striate, subobtuse. Palea similar to lemma. Stamens 3, anthers short. Styles 2, stigmas feathery.

Common in pine forests and in shaded areas.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1136 Shillong (Khasi Hills).

Digitaria violascens Link. Hort. Berol. 1: 229. 1827; Bor in Fl. Assam 5: 208. 1940 et Grass. Burm. Ceyl. Ind. Pak. 307. 1960; Jain in Rec. Bot. Surv. India 20(2): 235. 1973; Veldkamp in Blumea 21: 63. 1973; Babu Herb. Fl. Dehra Dun 607. 1977.

Annuals. Culms suberect from geniculate base, rooting at nodes, glabrous, 20-40 cm high. Leaves linear, tapering to a fine point, margin scabrid, leaf-blades 5-20 x 0.4-0.8 cm, narrowed towards the base. Sheaths loose, glabrous, shorter than the internodes. Ligules membranous, truncate, 1-1.5 mm long. Inflorescence subdigitate, of 4-6 racemes, 4-10 cm long. Rhachis winged, scabrid. Spikelets 2-nate, one with longer pedicels and the other with shorter pedicels. Spikelets globose or ovate-acute, 1-2 mm long, lower glumes present or absent, very small. Upper glumes as long as the spikelets, 5-7-nerved; lemmas broad, ovate, margin incurved, 5-7-nerved. Palea hoary. Stamens 3. Styles 2. Lower florets sterile.

Common in fallows.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1724 Agarobadha (Garo Hills); 1742 Burnihat (Khasi Hills).

Dimeria R. Br.

Annuals or perennials. Culms slender. Leaves narrow. Inflorescence a false spike; rhachis triquetrous or flattened. Spikelets numerous, solitary, shortly pedicelled, apparently 1-flowered as the lower floret reduced to an empty lemma. Glumes rigid, 1-nerved; lemmas keeled, 1-nerved, 2-toothed or 2-lobed, rarely entire, with a twisted awn inbetween the lobes. Paleas small or absent. Lodicules small or absent. Stamens 2, rarely 3.

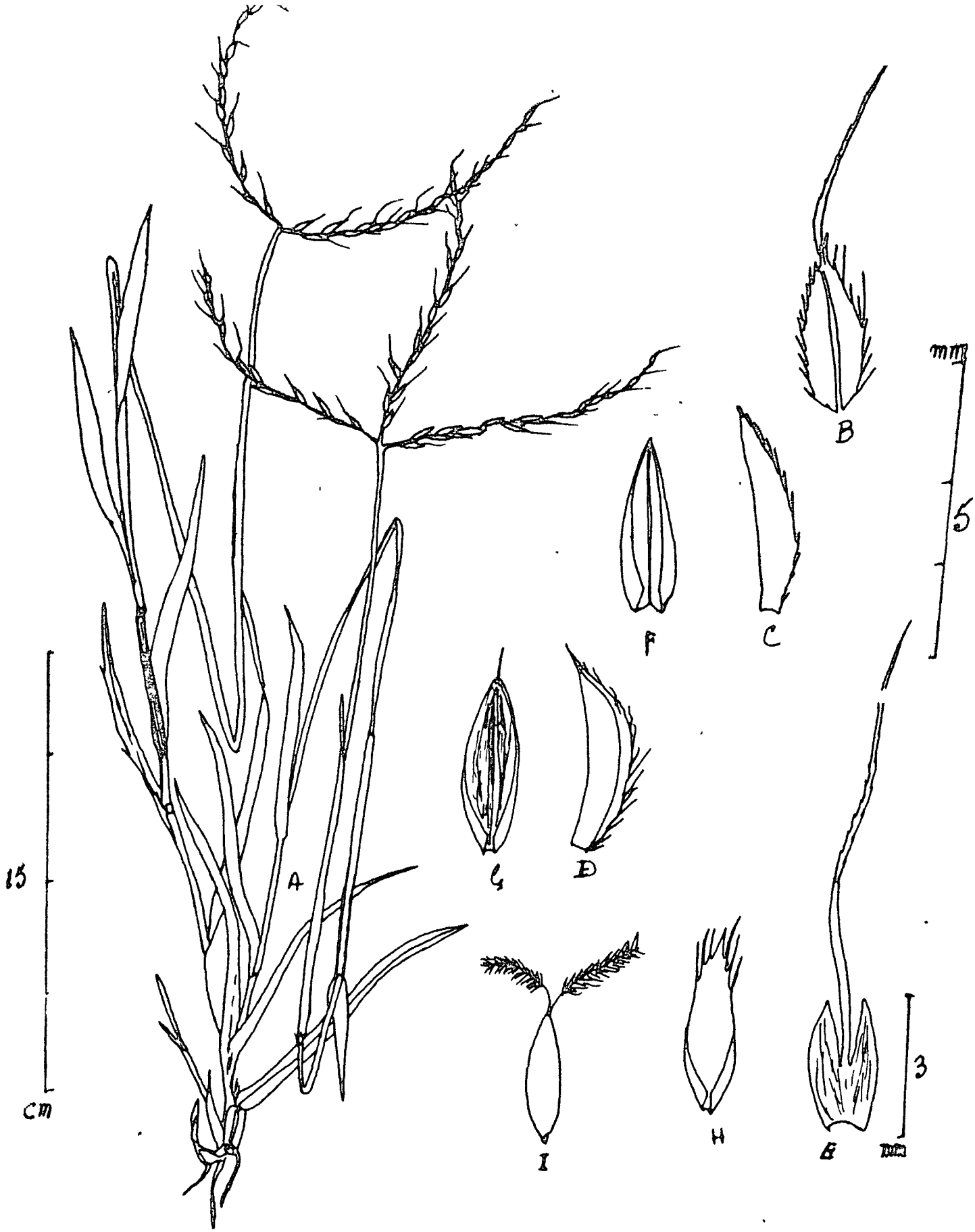


Plate 46 Dimeria fuscescens Trin. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lower Lemma, F. Upper Lemma, G. Palea, H. Lodicule, I. Pistil.

Stigmas shortly exserted laterally near the base of the spikelet Caryopsis linear.

K E Y T O S P E C I E S

1a. Perennials; spikelets 5-7 mm long, fuscous; upper glumes with a narrow wing or wingless. . . . . fuscescens

1b. Annuals; spikelets 1-3 mm long, not fuscous;

2a. Spikelets 1.5-2.5 mm long; anthers 0.5 mm long . . . . . ornithopoda

2b. Spikelets 2-3 mm long; anthers much longer than the above . . . ornithopoda var. megalantha

Dimeria fuscescens Trin. in Mem. Acad. Petersb. ser. 6, 2: 335. 1833; Hook.f. Fl. Brit. India 7: 105. 1896; Bor in Fl. Assam 5: 419. 1940 et Grass. Burm. Ceyl. Ind. Pak. 140. 1960(Plate 46).

Perennials. Culms erect, tufted or solitary, 30-80 cm high, glabrous, hairy only at nodes. Leaves 5-20 x 0.3-0.5 cm, hairy on both surfaces, margin scabrid, tapering towards the base, sheaths loose, hairy. Ligules membranous. Inflorescence digitate or subdigitate or 3 racemes, 4-8 cm long, rhachis trigonous, undulated, scabrid on the ridge, pedicels stout, 1 mm long, scabrid. Spikelets violet, 4-5 mm long. Glumes linear, brownish violet, scabrid on the margin and on the back, nerves indistinct. Lemmas hyaline, linear, with 5-8 mm long awn, inserted in the sinus. Stamens 3, filaments very short. Styles yellowish white, stigmas feathery.

Occasional in pine forests and open grasslands.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1138 Shillong, 1245 Mawsmai (khasi Hills).

Dimeria ornithopoda Trin. Fund. Agrost. 167. t. 14. 1820; Hook.f. Fl. Brit. India 7: 104. 1896; Bor in Fl. Assam 5: 420. 1940 et Grass. Burm. Ceyl. Ind. Pak. 142. 1960.

Annuals. Culms highly branched, glabrous, hairy at nodes. Leaves erect, 3-5 x 0.1-0.3 cm, usually black spotted or brown when dry, acute, hairy with few tubercle based hairs, scabrid on margin. Ligule membranous. Inflorescence of 2 racemes, sessile, spreading or erect, Rhachis glabrous, scabrid only on margin, internodes shorter than the spikelets. Spikelets sessile, compressed on the rhachis. Lower glumes shorter than the spikelets, coriaceous, papery towards the keels. Upper glumes as long as the spikelets, margin membranous, acuminate. Lemmas linear, awn 5-10 mm long, inserted in the sinus. Stamens 3, anthers short, 1 mm long. Styles 2, stigmas feathery. Caryopsis elongated.

Abundant in open areas, in pine forests and on hill slopes.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1180 Shillong, 1242 Mawsmai 1304 Pariong (Khasi Hills); 1290 Sohkha (Jaintia Hills).

Dimeria ornithopoda var. megalantha Bor in Kew Bull. 1952: 576. 1952 et Grass. Burm. Ceyl. Ind. Pak. 144. 1960.

Annuals. Culms branched, 15-20 cm high, glabrous shining. Leaves radical, 3-8 cm long, sheahts loose, glabrous. Ligule truncate, membranous 1 mm long. Inflorescence of 2-3 racemes. Rhachis undulated, winged. Spikelets few, arranged alternately on the rhachis, sessile or shortly pedicelled, 2-2.3 mm long, callus ovoid. Lower glumes linear, oblong as long as the spikelets, compressed, keel very scabrid, acute, obscurely nerved; upper glumes hyaline, pinkish, as long as the lower glumes, but broader, margin ciliate. Lemmas hyaline, 2-lobed, with a long awn in between the lobes, awn up to 1 cm long, scabrid. Palea minute, hayline. Stamens 3. Styles 2. Ovary equalling the lemma.

Abundant in fallows and in exposed places in forests.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1304 Pariong (Khasi Hills).

Eccoilopus Steud.

Eccoilopus cotulifer (Thunb.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 70: 92. 1923; Bor in Fl. Assam 5: 308. 1940 et Grass. Burm. Ceyl. Ind. Pak. 145. 1960. - - Andropogon cotulifer Thunb. Fl. Jap. 41. 1784. - - Eulalia cotulifer (Thunb.) Munro ap.Miq. Pool. Fl. Jap. 177. 1866. - - Eccoilopus andropogonoides Steud.

Syn. Pl. Glum. 1: 124. 1854. - - Miscanthus cotulifer (Thunb.) Benth. in Journ. Linn. Soc. Bot. 19: 65. 1881. - - Spodiopogon cotulifer (Thunb.) Hack. in DC. Monogr. Phan. 6: 187. 1889.

Annuals. Culms tall, up to 2 m high or more glabrous and glaucous. Leaves linear, 15-60 x 1-3 cm, hairy, midrib prominent, acute at apex, sheaths glabrous, shorter than the internodes. Ligules membranous with tufts of hairs. Panicles 20-30 cm long, branched. Branches sub-verticillate, capillary. Spikelets fusiform, 6-7 mm long, deciduous. Rhachis and branchlets usually brownish green. Pedicels clavate, hairy. Lower glumes 6 mm long, acute, shortly awned, 2-lobed, hairy, 11-nerved; upper glumes similar to the lower glumes, but with longer awns. Lemmas 4-5 mm long, deeply 2-lobed, scaberulous. Palea oblong, broad, apex erose, nerveless, hyaline. Lodicules 2, ovate-acute, nerveless. Stamens 3, anthers pale red, 4 mm long. Styles 2, stigmas flexuous.

Common on hills and along the banks of streams, rivers, and in grasslands.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3287 Nongkrem (Khasi Hills); Jowai (Jaintia Hills).

Echinochloa P. Beauv.

Annuals or perennials. Culms erect, branched. Leaves linear, with prominent white midrib. Panicles of crowded or loosely

arranged, secund spiciform branches. Spikelets 2-flowered, ovate or ovate-lanceolate, more or less hispid on the nerves of the glumes, 2-nate or clustered on the abaxial side on the triquetrous rhachis. Lower florets male or barren; upper hermaphrodite. Glumes unequal, 3-5-nerved, cuspidate or shortly awned. Palea similar to the lemmas, 2-keeled; lemmas of upper floret convex on the back, sub-coriaceous or crustaceous, obscurely 5-nerved. Lodicules 2, fleshy. Stamens 3. Styles distinct; stigmas exserted from the tip of the spikelets. Caryopsis elliptic with punctate hilum.

K E Y T O S P E C I E S

1a. Ligule represented by a fringe of hairs . . stagnina
1b. Ligule absent.
  2a. Spikelets 5-6 mm long . . . . frumentacea
  2b. Spikelets less than 5 mm long.
    3a. Lower glumes and upper lemmas equally acute or cuspidate; racemes distant . . colonum
    3b. Lower glumes and upper lemma not equally cuspidate, but produced into an awn.
      4a. Spikelets 3.8 mm long, in simple, false spikes, more or less awned from the lower floret . . cruss-galli
      4b. Spikelets smaller than the above; densely clustered in compound, false spikes; awnless . . . . . cruss-pavonis

Echinochloa colonum Link. Hort. Berol. 209. 1827; Bor in Fl. Assam 5: 246. 1940 et Grass. Burm. Ceyl. Ind. Pak. 308. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 360. 1966; Babu Herb. Fl. Dehra Dun 607. 1977. - - Panicum colonum Linn. Syst. Nat.

ed. 10, 2: 870. 1759; Hook. f. Fl. Brit. India 7: 32. 1896.

Vern.-'Kreng' (K).

Annuals. Culms 20-80 cm high, geniculate from the base, glabrous. Leaves linear or linear-lanceolate, acute, glabrous, margin slightly scabrid, blades 10-40 x 0.5-1 cm, sheaths glabrous; ligule 0. Panicles 5-12 cm long, branches distant, alternate, crowded. Axis hairy. Spikelets secund,4-ranked, globose, acute, or subacute, 2-3 mm long. Lower glumes ovate, clasping at the base, membranous, 3-5-nerved, cuspidate; upper glumes membranous, ovate, concave, acute or cuspidate, 5-7-nerved. Lemmas similar to the upper glumes, but depressed on the back, awnless. Palea as long as the lemma but hyaline. Stamens 3, anthers yellow or brown. Stigmas feathery. Caryopsis shining, compressed on one side.

A weed of marshes and paddy fields.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1064 Shillong; 1462 Burnihat, (Khasi Hills); 1623 Songsak (Garo Hills); 1910 Jowai (Jaintia Hills).

Echinochloa **crus-galli** (Linn.) P. Beauv. Ess. Agrost. 53: 161. 1812; Bor in Fl. Assam 5: 247. 1940 et Grass. Burm. Ceyl. Ind. Pak. 310. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 360. 1966; - - Panicum **crus-galli** Linn. Sp. Pl 56. 1753 (Plate 47).

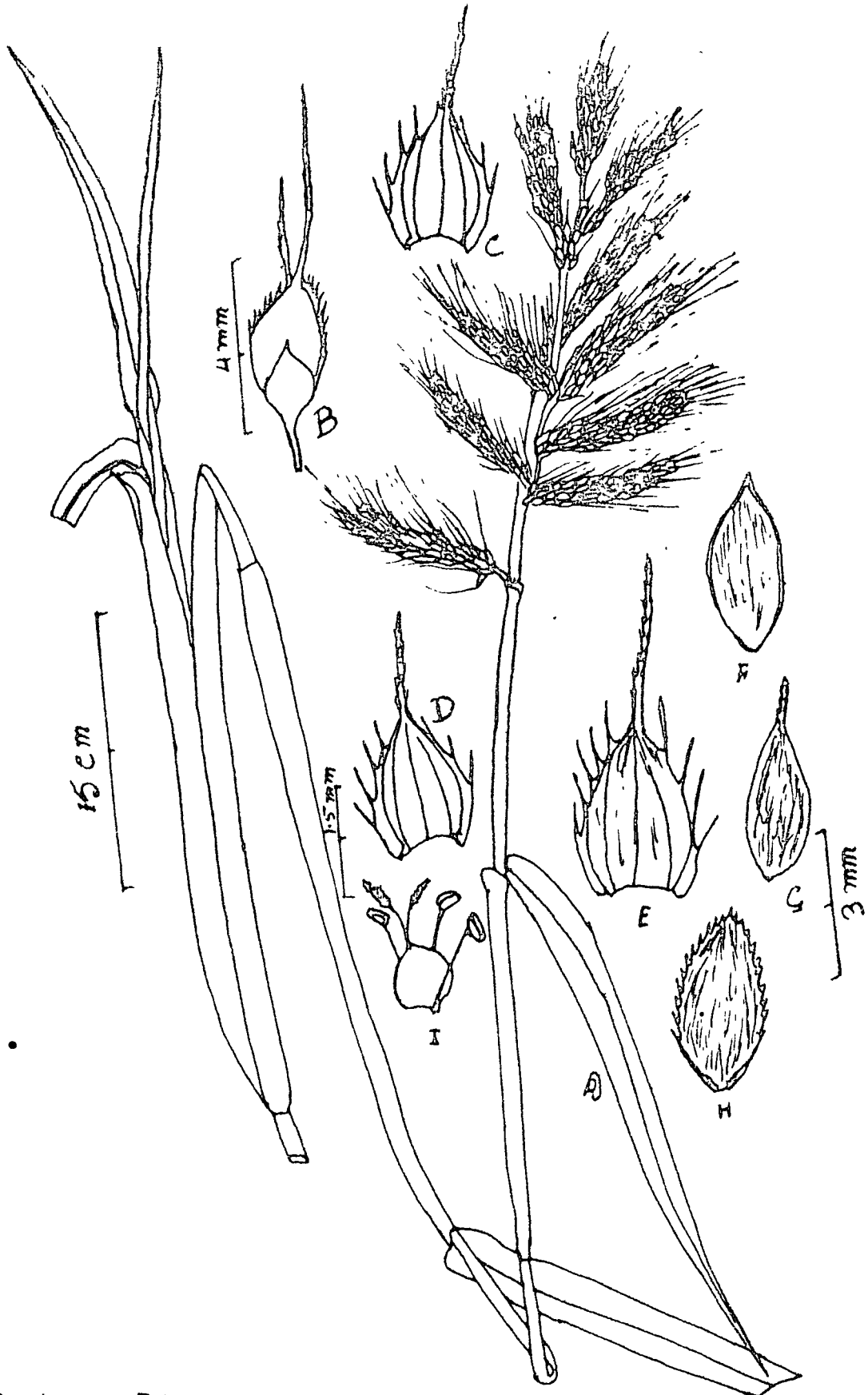


Plate 47 Echinochloa cruss-galli P.Beauv. A. A portion of stem, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F & G. Paleas, H. Lodicule, I. Pistil and Androecium.

Vern.-'Kreng' (K).

Annuals. Culms erect, branched from the lower nodes, 0.5-1 m high. Leaves linear, 10-20 x 0.8-1.5 cm, glabrous, margin scabrid; sheaths loose, ligule 0. Inflorescence a panicle, 8-20 cm long, contracted or spreading; axis triquetrous, scabrid, hairy, branches solitary or 2-nate. Pedicels 2-nate. Spikelets crowded, ovate-acute, 3.5-4 mm long. Lower glumes membranous, broadly ovate-oblong, acute, cuspidate as long as the spikelets, 5-7-nerved. Lower florets barren; lemmas similar to the upper glumes, scabrid, 7-nerved, awn flexuous. Palea elliptic, shorter than the lemma. Upper floret hermaphrodite, 2.5 mm long, lemma and palea similar. Stamens 3. Stigmas plumose, exserted laterally near the tip of the spikelets. Caryopsis 2 mm long.

A weed of paddy fields.

Fls. & Frts. : September to November.

Specimens examined: Myrthong

Echinochloa crus-pavonis (H.B.& K) Schult. Mant. 2: 269. 1824; Bor in Fl. Assam 5: 248. 1940 et Grass. Burm. Ceyl. Ind. Pak. 310. 1960; Babu Herb. Fl. Dehra Dun 608. 1977. - - Oplismenus cruspavonis H.B. & K. Nov. Gen. et Sp. 1: 108. 1816.

Vern.- ' Kreng' (K).

Annuals. Culms tall, erect, thick and spongy below. Leaves 10-35 x 0.5-2 cm, linear-lanceolate, narrowed at base, apex acute, margin scabrid. Sheaths all along the culm. Ligule 0. Panicles 10-20 cm long, branches crowded in the middle, subopposite or solitary. Axis stout, angular, scabrid on the keels. Pedicels usually with white, ivory, tubercle based hairs at the base. Spikelets ovate-elliptic, or elliptic-oblong. Lower glumes clasping at the base of the spikelets, broader than the length, membranous, distinctly 3-nerved, with 2 indistinct nerves. Upper glumes ovate, concave, cuspidate or mucronate, scabrid or spinous on the keels, 5-nerved. Lemma similar to the upper glume with long aristate tip, 1 cm long or more long, scabrid all over. Palea hyaline, scaberulous above. Stamens 3. Styles 2, stigmas feathery. Caryopsis shining.

Common weed of paddy fields. It is a good fodder grass of the area.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1697

Echinochloa frumentocea Link. Enum. Hort. Berol. 204. 1827; Bor in Fl. Assam 5: 245. 1940 et Grass. Burm. Ceyl. Ind. Pak. 311. 1960; Babu Herb. Fl. Dehra Dun 608. 1977.

Vern.-'Kreng' (K).

Annuals. Culms tall, erect, up to 1 m high, glabrous. Leaves linear, lanceolate, tapering towards the apex, margin scabrid, blades 10-60 x 1-2 cm; sheaths loose, longer than the internodes, marked by white glabrous ring. Ligule a short, membranous ring. Panicles of alternate, 2-nate racemes. Axis angular, hairy. Branches crowded in the middle. Spikelets globose, acute, 5-6 mm long. Lower glumes clasping, 5-nerved, cuspidate, 3 mm long, scabrid on the nerves; upper glumes 5-6 mm long, acute or cuspidate, 5-7-nerved, scabrid on the nerves. Lemmas similar to the upper glumes. Palea equal to the spikelets, hyaline. Lodicules 2, cuneate, concave at the tip. Stamens 3. Styles 2, stigmas feathery.

A weed of paddy fields.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1192 Shillong.

Echinochloa stagnina (Retz.) P. Beauv. Ess. Agrost. 161. 1812; Bor in Fl. Assam 5: 244. 1940 et Grass. Burm. Ceyl. Ind. Pak. 311. 1960. - - Panicum stagninum Retz. Obs. Bot. 5: 17. 1789.

Annuals. Culms long, prostrate, copiously rooting at the lower nodes, geniculate, glabrous. Leaves 10-40 x 0.5-2 cm, narrowed at base, glabrous, slightly scabrid on the margin, acute; sheaths loose, terete. Ligule a ring of stiff hairs. Panicles 1-5 cm long. Axis scabrid, racemes alternate, Spikelets ovate, or ovate-lanceolate, acute, 2-nate, 4-8 mm long. Lower glumes ovate, shorter

than the upper glumes, acute generally with tubercle based hairs, 3-5-nerved; upper glumes ovate, hairy on the keels, acuminate or produced into a short scabrid awn, 5-7-nerved. Lower florets male or sometimes barren. Lemmas similar to the upper glumes but flat and subhyaline, Upper florets hermaphrodite; lemmas lanceolate. Palea subcoriaceous. Stamens 3, anthers yellow. Styles 2. Caryopsis glabrous, ovate-oblong, 2-3 mm long.

Common in lower lower elevations. A weed of paddy fields.

Fls. & Frts. : October to March.

Specimens examined: Myrthong 1457 Burnihat (Khasi Hills); 1677 Songsak (Garo Hills).

Eleusine Gaertn.

Annuals. Culms glabrous, laterally compressed with swollen nodes. Leaves linear, flat or convolute. Spikes in terminal umbel, whorled or sometimes 1 or more below the apex of culms, rarely solitary. Spikelets laterally compressed, in 2 or more rows on one side of the flattened rhachis; rhachis terminating in a spikelet. Florets 3-12, hermaphrodite or the uppermost reduced. Glumes persistent, disimilar, obtuse or acute, 1-5-nerved; lemmas similar to the glumes, 3-nerved or sometimes 5-nerved. Paleas shorter than the lemmas, narrowly winged. Lodicules 2. Stamens 3. Stigmas 2, shortly exserted from the tip of the spikelets. Caryopsis elliptic or globose.

K E Y T O S P E C I E S

1a. Spikes slender, narrow, not more than 5 mm wide, straight; caryopsis oblong, trigonous . . *indica*

1b. Spikes stout, up to 1 cm across; caryopsis globose . . . . . *coracana*

Eleusine coracana (Linn.) Gaertn. Fruct. 1, 8. t. 1. f. 11. 1789; Hook.f. Fl. Brit. India 7: 294. 1896; Bor in Fl. Assam 5: 109. 1940 et Grass. Burm. Ceyl. Ind. Pak. 492. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 360. 1966; Babu Herb. Fl. Dehra Dun 609. 1977. - - *Cynosurus coracanus* Linn. Syst. Nat. ed. 10, 2: 875. 1759.

Vern.-'Raitruh '(K).

Annuals. Culms solitary, branched, stout 0.5-1 m high, laterally compressed, glabrous. Leaves linear, 20-60 x 0.5-1 cm, glabrous, margin scabrid; sheaths loose. Ligule a ring of hairs. Inflorescence stout, umbellate or digitate, 4-8 racemes, 5-8 cm long. Spikelets mumerous, congested, obtuse, 3-5-flowered, globose, acute. Lower glumes ovate, with few median nerves, obtuse; upper glumes similar to lower glumes ; lemmas as long as the glumes. Palea hyaline, nerveless. Stamens 3. Styles 2. Caryopsis globose, rounded, black or bright red at maturity.

Cultivated for its grains. A sort of local drink is also prepared from the grains.

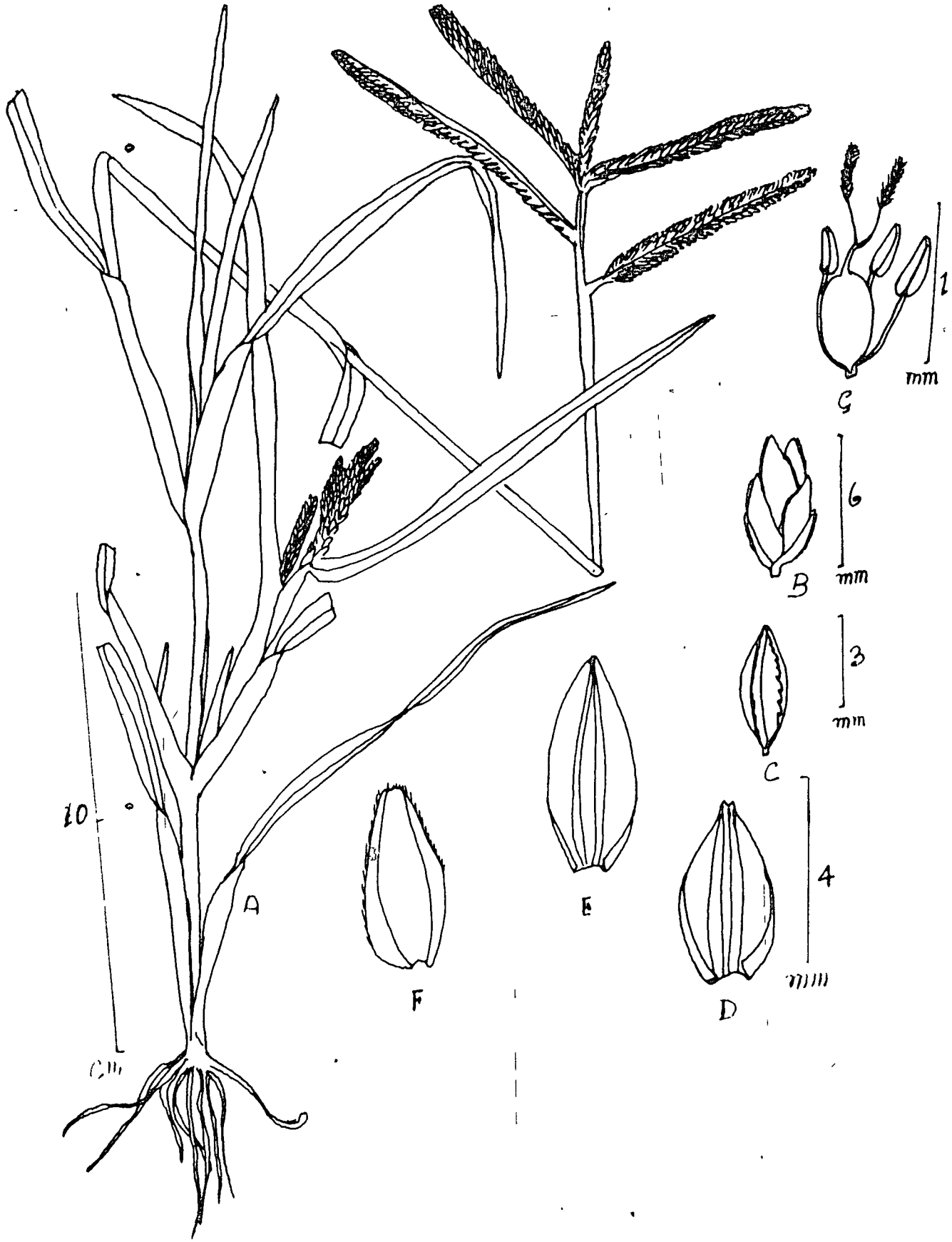


Plate 48 Eleusine indica (Linn.) Gaertn. A.Habit, B.Spikelet, C.Lower Glume, E.Lemma, F.Palea, G.Pistil & Stamens.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1339 Shillong (Khasi Hills).

Eleusine indica (Linn.) Gaertn. Fruct. 1: 8. 1789; Hook.f. Fl. Brit. India 7: 293. 1896; Bor in Fl. Assam 5: 108. 1940 et Grass. Burm. Ceyl. Ind. Pak. 493. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 360. 1966; Babu Herb. Fl. Dehra Dun 609. 1977. Cynosurus indicus Linn. Sp. Pl. 72. 1753 (Plate 48).

Vern.- 'Kraimasi' (K).

Annuals. Culms solitary of tufted, erect or geniculate from the lower nodes, glabrous, slightly compressed, 2-3-nodes, 10-60 cm high. Leaves linear, incurved, glabrous; 5-30 x 0.2-0.8 cm, obtuse or slightly acute; sheaths loose glabrous or ciliate. Ligule membranous, of a fring of hairs. Inflorescence umbellate racemes, 2-4, 2-15 cm long. Axis glabrous or pubescent. Spikelets ovate, 3-7 mm long, 3-8-flowered. Lower glumes 3-6 mm long, ovate-lanceolate, acute or obtuse, 3-6-nerved, median nerve bifurcated above; upper glumes 3-5 mm long, obtuse, 3-6-nerved. Lemma as long as the glumes, nerveless. Palea hyaline, as long as the grain. Stamens 3. Styles 2, stigmas feathery.

Common on roadsides, waste places. A weed of cultivation. Forms a good fodder grass also.

Fls. & Frts.: August to December.

Specimens examined: Myrthong 1042 Shillong, 1608 Pariong (Khasi Hills); 1265 Sohkha, (Jaintia Hills); 1475 Tura (Garo Hills).

Elytrophorus P. Beauv.

Elytrophorus spicatus (Willd.) A. Camus in Lecomte Fl. Gen. de Indo-chine 7: 547. 1927; Bor in Fl. Assam 5: 92. 1940 et Grass. Burm. Ceyl. Ind. Pak. 493. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 361. 1966. - - Dactylis spicata Willd. in Ges. Naturf. Freunde Berlin, Neue Schrift 3: 416. 1801.

Annuals. Culms erect, 5-40 cm high, geniculate at base, branched. Leaves linear, 5-20 x 0.2-0.4 cm, acute, scabrid on margin; sheaths loose. Ligule membranous, truncate. Spikes cylindric, interrupted, 5-30 cm long, bristly. Branches erect, 1-5 cm long, distant. Rhachis scabrid. Spikelets 2-4 mm long. Glumes 1-nerved, lanceolate, 4 mm long, finely acuminate, or cuspidate, cusp rough, 2 mm long. Lemmas lanceolate, 2 mm long, ciliate, 3-nerved. Palea short, broad, truncate, winged. Stamens 3. Styles 2. Caryopsis lanceolate.

A weed of paddy fields in lower elevations and also in marshes.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1488 Nongpoh (Khasi Hills).

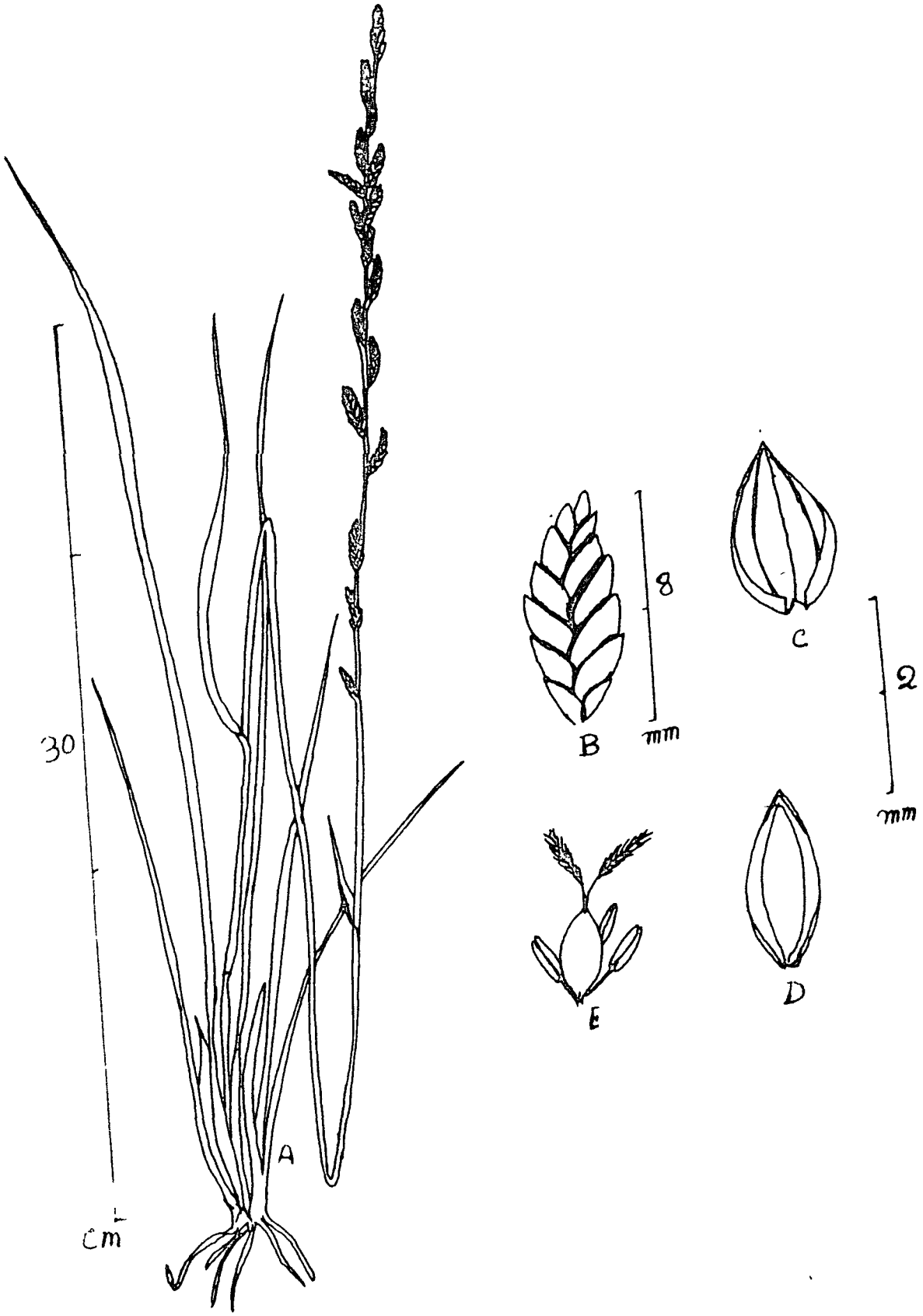


Plate 49 Eragrostiella leioptera (Stapf) Bor A. Habit B. Spikelet, C. Glume, D. Lemma, E. Pistil with Androecium.

Eragrostiella Bor

Eragrostiella leioptera (Stapf) Bor in Fl. Assam 5: 106. 1940 et Grass. Burm. Ceyl. Ind. Pak. 495. 1960. - - Eragrostis leioptera Stapf in Hook.f. Fl. Brit. India 7: 325. 1896 (Plate 49).

Annuals. Culms erect, tufted, 20-80 cm high. Leaves terete, 10-30 long, triangular, sheaths shorter than the internodes; ligule a ring of short hairs. Inflorescence a slender, erect raceme. Spikelets secund, distant, ovate-lanceolate, acute, laterally compressed, 4-10 mm long. Pedicels 1-2 mm long, glabrous. Lower glumes 1 mm long, hyaline, 1-nerved; upper glumes broadly ovate, acute, 3-nerved. Lemmas broad, ovate, 2-keeled, hyaline. Palea linear, hyaline 2-keeled. Styles 2, stigmas feathery, broad.

Common along the banks of streams, rivers and on rocks, also in open grasslands.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1071 Shillong, 1231 Mawmluh (Khasi Hills).

Eragrostis P. Beauv.

Annuals or perennials. Culms erect or geniculate from the base or sometimes prostrate. Spikelets laterally compressed, rarely terete, many-flowered, hermaphrodite or the upper reduced to an empty lemma; glumes equal or subequal, membranous, 1-3-nerved.

Lemmas acute or obtuse, awnless, 3-nerved. Paleas as long as the lemmas, 2-keeled. Lodicules 2. Stamens 2-3. Caryopsis ovoid or oblong.

K E Y T O S P E C I E S

1a. Spikelets breaking up from above downwards.
  2a. Paleas ciliate on the keels.
    3a. Panicles compact ; lemmas ciliate on margin . . . . . coarctata
    3b. Panicles not compact; lemmas not ciliate on the keels . . . . tenella
  2b. Paleas not ciliate on the keels . . japonica
1b. Spikelets breaking up from below upwards.
  4a. Spikelets ovate or oblong, 3 mm wide . . unioloides
  4b. Spikelets lanceolate, less than 3 mm wide.
    5a. Spikelets 2-2.5 mm wide, oblong . . gangetica
    5b. Spikelets less than 2 mm wide, linear to lanceolate.
      6a. Annuals; spikelets pale or greenish white . . . . . pilosa
      6b. Perennials; spikelets olive-grey or black . . . . . nigra

Eragrostis coarctata Stapf apud. Hook.f. Fl. Brit. India 7: 313. 1896; Bor in Fl. Assam 5: 94. 1940 et Grass. Burm. Ceyl. Ind. Pak. 507. 1960; Babu Herb. Fl. Dehra Dun 611. 1977.

Tufted grasses. Culms geniculate, ascending from the nodes, glabrous, 10-50 cm high. Leaves linear, 5-10 x 0.5-0.6 cm, tapering to a fine point, glabrous, margin scabrid; sheaths loose. Ligule a ring of short hairs. Panicles compact, spiciform. Spikelets

crowded on short pedicels 2-3 mm long. Glumes subequal; lemmas ovate, acute, 3-nerved, lateral nerves prominent, margin scabrid. Palea smaller than the lemma, 2-nerved, hyaline. Stamens 3. Stigmas feathery.

Occasional in lower elevations.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1453 Tura (Garo Hills).

Eragrostis gangetica (Roxb.) Steud. Syn. Pl. Glum. 1: 266. 1854; Bor in Fl. Assam 5: 101. 1940 et Grass. Burm. Ceyl. Ind. Pak. 508. 1960; Babu Herb. Fl. Dehra Dun 611. 1977. - - Poa gangetica Roxb. Fl. Ind. 1: 341. 1820, (Plate 50).

Perennials. Culms erect or suberect, 30-100 cm high, glabrous, sheaths loose, shining. Ligule a ring of hairs. Panicle 5-20 cm long, nodding, rhachis stout, glabrous, branched. Spikelets elongate, oblong, laterally compressed, 4-6 mm long, 10-20-flowered. Lower glumes 2-4 mm long, acute, glabrous, 1-nerved; upper glumes mostly 3-nerved, ovate, acute. Lemmas awnless, linear, hyaline. Palea as long as lemma. Lodicules 2, shining, embracing the grains. Stamens 3. Stigmas 2, feathery.

Common throughout the state, on the embankments of fields, in abandoned cultivated lands and also in forest clearings.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1013 Shillong, 1823 Markasa (Khasi Hills); 1403 Baghmara, 1463 Tura (Garo Hills).

Eragrostis japonica (Thunb.) Trin. in Mem. Acad. Petersb. Ser. 1, 6: 405. 1831; Bor in Fl. Assam 5: 97. 1940 et Grass. Burm. Ceyl. Ind. Pak. 509. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 361. 1966; Babu Herb. Fl. Dehra Dun 612. 1977. - - Poa japonica Thunb. Fl. Jap. 51. 1784.

Annuals. Culms erect or geniculately ascending from base, glabrous. Leaves linear, acute, 2-25 x 0.2-0.6 cm, sheaths loose; ligule membranous, 1 mm long. Panicles linear or contracted, spiciform. Branches verticillate, spreading. Rhachis scabrid. Spikelets linear compressed, 6-10-flowered, 1-3 mm long. Lower glumes linear, obtuse, 1-nerved, hyaline; upper glumes similar to the lower glumes. Lemmas ovate, 3-nerved. Palea keeled, hyaline. Stamens 2. Styles 2, stigmas feathery. Caryopsis shining, elliptic.

A weed of paddy fields in lower elevations.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1459 Phulbari (Garo Hills).

Eragrostis nigra Nees ex Steud. Nom. ed. 2, 1: 563. 1840; Hook.f. Fl. Brit. India 7: 324. 1896; Bor in Fl. Assam 5: 101. 1940 et Grass. Burm. Ceyl. Ind. Pak. 511. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 362. 1966.

Annuals or perennials. Culms solitary or tufted,erect or geniculate, 30-100 cm high. Leaves dense at base, linear, 10-50 x 0.2-0.8 cm, glabrous or scabrid on the keels, tapering towards the fine point. Ligule a rim of short white hairs. Panicles spreading, ovate or lanceolate, 5-30 cm long. Rhachis glabrous, striate, branches filiform, slightly undulate. Pedicels long or short, filiform. Spikelets laterally compressed, acute, 2-6 mm long, olive-grey, 2-20-flowered. Glumes subequal, 1-nerved, acute, glabrous; lemma ovate, subacute, 1-3-nerved. Palea hyaline, obtuse. Stamens 3, antners short. Styles 2, stigmas plumose. Caryopsis ovate-lanceolate.

Abundant in all types of soil both in open and in shaded places. A weed of cultivation.

Fls. & Frts. : March to November.

Specimens examined: Nyrthong 1103 Shillong, 1824 Markasa (Khasi Hills); 1594 Songsak (Garo Hills).

Eragrostis pilosa (Linn.) P. Beauv. Ess. Agrost. 7, 162: 175. 1812; Hook.f. Fl. Brit. India 7: 323. 1896; Bor in Fl. Assam 5: 103. 1940 et Grass. Burm. Ceyl. Ind. Pak. 512. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 362. 1966; Babu Herb. Fl. Dehra Dun 612. 1977.

Culms erect, branched at base, 3-30 cm high, glabrous, angular. Leaves 2-4 x 0.1-0.3 cm, striate, glabrous, scabrid on margin. Sheaths glabrous, striate. Ligule a ring of hiars. Panicle

very variable, 2-10 cm long, main axis angular, slender, branches filiform, slightly zigzag. Spikelets 3-4 mm long, slightly compressed, 4-10-flowered. Lower glumes very short, upper glumes ovate, 1 mm long, acute, with distinct median nerve; lemma more than 1 mm long, hyaline, broadly ovate, subacute, 3-nerved. Palea smaller than the lemma 2-toothed, keels scabrid. Stamens 3, anthers very short. Styles 2, stigmas feathery.

Common in open sandy areas and on freshly turned soils, in lower elevations.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1559 Lailad (Khasi Hills).

Eragrostis tenella (Linn.) R. & S. Syst. 2: 576. 1817; Hook. f. Fl. Brit. India 7: 315. 1896; Bor in Fl. Assam 5: 96. 1940 et Grass. Burm. Ceyl. Ind. Pak. 513. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 362. 1966; Babu Herb. Fl. Dehra Dun 613. 1977. Poa tenella Linn. Sp. Pl. 69. 1753.

Annuals. Culms geniculate, ascending from base, 3-6 noded, glabrous; leaves linear, 3-15 x 0.1-0.5 cm, tapering to a fine point, involute when dry; sheaths striate, hairy. Ligules reduced to a ring of short hairs. Panicle linear, contracted, 5-15 cm long. Rhachis glabrous, hairy at the nodes. Spikelets spreading 1-2 mm long, 1-10-flowered. Pedicels filiform; lower glumes linear, 1-nerved, obtuse; upper glumes ovate, 3-nerved. Lemmas similar to the upper glumes. Palea ciliate on margin. Stamens 3.

Stigmas 2, feathery.

Common in fallows in lower elevations and foothills.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1912 Phulbari (Garo Hills); Sherma 16038 Umsaw (Khasi Hills)(ASSAM).

Eragrostis unioloides (Retz.) Nees ex Steud. Syn. Pl. Glum. 264. 1854; Bor in Fl. Assam 5: 99. 1940 et Grass. Burm. Ceyl. Ind. Pak. 515. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 363. 1966; Babu Herb. Fl. Dehra Dun 614. 1977. - - Poa unioloides Retz. Obs. 5: 19. 1789.

Culms solitary or tufted, 6-60 cm high, geniculate from below, glabrous, 2-4 nodded. Leaves linear, mostly radical, 2-20 x 0.5-0.8 cm, acute, glabrous, scabrid only on margin; sheaths loose; ligules membranous. Panicles 3-30 cm long, rhachis stout, angular. Pedicels long, filiform, Spikelets compressed, ovate, acute, purplish or reddish 20-50-flowered. Lower glumes empty, acute, 1-nerved; upper glumes ovate, acute, 1-3-nerved. Lemmas awnless, hyaline. Palea hyaline or membranous. Stamens 3. Stigmas 2, feathery. Caryopsis elliptic, acute.

Common in fallows and in cultivations as weed, specially in wet soils.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1095 Shillong, 1209 Cherrapunjee (Khasi Hills); 1418 Baghmara (Garo Hills).

Eriochloa Kunth

Eriochloa procera (Retz.) C. E. Hubb. in Kew Bull. 1930: 256. 1930; Bor in Fl. Assam 5: 268. 1940 et Grass. Burm. Ceyl. Ind. Pak. 312. 1960. - - Agrostis procera Retz. Obs. 4: 19. 1789.

Annuals. Culms up to 60 cm high, erect from a geniculate base, tufted, glabrous or with few adpressed hairs at nodes. Leaves 20 x 0.2-0.6 cm, convolute, glabrous; sheaths loose, auriculate; ligule a ring of hairs. Panicles oblong, branched. Axis and rhachilla angular, scabrid or glabrous. Pedicels swollen at base forming a ring-like structure. Spikelets 2.5-3 mm long, with shining hairs on the face, ovate lanceolate, acute. Lower glumes absent. Upper glumes as long as the spikelets, 5-nerved, infolded, with adpressed hairs on the dorsal face. Lemmas as long as the glumes, 5-nerved, awnless. Palea nerveless, apex rounded, mucronate with a short arista. Lodicule 1, similar to the palea, apex depressed, stamens 3. Stigmas 2, flexuous.

Common weeds in paddy fields at lower elevations.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1458 Phulbari (Garo Hills); 1920 Burnihat (Khasi Hills).

Eulalia Kunth

Perennials. Leaves small, flat, convolute in buds. Racemes silvery brown, or purplish. Rhachis fragile. Spikelets 2-nate, one sessile and the other pedicelled, 2-flowered, lower florets reduced to an empty lemma or scale-like; upper hermaphrodite. Glumes equal, membranous, with inflexed margin. Lemma hyaline, upper lemma 2-lobed, awned. Paleas absent or if present very minute. Lodicules 2. Stamens 3. Stigmas laterally exserted. Caryopsis oblong.

K E Y T O S P E C I E S

1a. Upper glume of sessile spikelets with an arista; lower glume of sessile spikelet obtuse or 2-lobed . . . . . pallens

1b. Upper glume of sessile spikelets without an arista; lower glume of sessile spikelet acute or obtuse not lobed.

2a. Panicle of verticillate racemes . . . fastigiata

2b. Panicle of digitate or fascicled racemes.

3a. Sessile spikelets 4-6 mm long; hairs on the rhachis and pedicels [illegible] yellow or purplish, not white.

4a. Hairs on rhachis golden or pale golden; lower glume of sessile spikelets 4-nerved; nerves green and anastomosing above . . . . . quadrinervis

4b. Hairs on the rhachis pale violet; lower glumes of sessile spikelets, obscurely 4-nerved. . . . . hirtifolia

3b. Sessile spikelets shorter than 4 mm long; rhachis covered with white hairs . . . trispicata

Eulalia fastigiata (Nees) Haines Bot. Bihar & Orissa 1014. 1924; Bor in Fl. Assam 5: 336. 1940 et Grass. Burm. Ceyl. Ind. Pak. 155. 1960. - - Saccharum fastigiatum Nees ex Steud. Syn. Pl. Glum. 1: 409. 1855;

Culms tall, glabrous except below the panicle. Leaves erect, glaucous, acuminate, base narrowed, blades 20-60 x 0.5-0.6 cm, margin scabrid, nerves thick, white; sheaths loose, glabrous, almost covering the internodes. Ligule short, 1 mm long, truncate. Panicles ovate, oblong, branches numerous, as long as main axis. Racemes sessile, upper ones shorter, densely covered with long, silky hairs. Spikelets linear, lanceolate, with spreading hairs, 4-5 mm long; lower glumes as long as the spikelets, 2-toothed, covered with long spreading, silky hairs, 2-nerved; upper glumes 4 mm long, lanceolate, papyraceous, acuminate, 1-nerved. Lower florets empty: lemma hyaline. Upper florets hermaphrodite: lemmas 3 mm long, awn [illegible] 1 cm long or more. Palea short. Stamens 3, anthers yellow. Stigmas 2, plumose.

Common in pine forests in association with other grasses.

[illegible]

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1342 Shillong (Khasi Hills); Deka 20371 Nartiang (Jaintia Hills) (ASSAM).

Eulalia hirtifolia A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 202. 1922; Bor Grass. Burm. Ceyl. Ind. Pak. 155. 1960.

Perennials. Culms simple, erect, 1-1.5 m high, glabrous, hairy only below the panicle. Leaves linear, 30-50 x 0.5-0.8 cm hairy, narrow to the apex and base, midrib prominent, margin scabrid; sheaths glabrous. Ligule brown, membranous, 2-lobed. Inflorescence of 3-4 digitate racemes, 15-20 cm long; rhachis silky hairy. Spikelets 2-nate, one sessile and the other pedicelled, 6 mm long. Lower glumes as long as spikelets, 5-7-nerved, marginal nerves many, 2-toothed, dorsal surface hairy, hairs overtopping the glumes; upper glumes hyaline, glabrous, 1-nerved, margin ciliate, equal to or slightly shorter than lower glumes; lemmas reduced, hyaline, 2-lobed, ciliate with long, scabrid awn inbetween the lobes. Palea oblong, hyaline, nerveless, with spreading hairs on margins. Lodicules 2-2.5 mm long, oblong-lanceolate, margin ciliate. Stamens 3. Stigmas 2, feathery.

Common in secondary forests, associated with other tall grasses.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 3212 Garumpani (Jaintia Hills).

Eulalia pallens (Hack.) O.Kuntze Rev. Gen. Pl. 2: 775. 1891; Bor in Fl. Assam 5: 340. 1940 et Grass. Burm. Ceyl. Ind. Pak. 156. 1960. - - Pollinia pallens Hack. in DC. Monogr. Phan. 6: 156, 1889; Hook.f. Fl. Brit. India 7: 217. 1896.

Annuals or perennials. Culms 30-90 cm high, erect, glabrous. Leaves linear, finely acuminate, margin scabrid, revolute; sheaths loose, glabrous, except on the mouth. Ligule membranous, truncate. Inflorescence of 5-10 digitate racemes, silky. Rhachis villous. Pedicels 2 mm long, hairy; spikelets narrow, lanceolate, 2-4 mm long. Lower glumes lanceolate, hairy, 3 mm long, cuspidate, 2-nerved; upper glumes similar to lower glume, 1-nerved. Lemmas obtuse, hyaline, awned. Palea hyaline, membranous, 2 mm long. Stamens 3, anthers purple. Stigmas 2, red. Caryopsis brownish-yellow.

Common in open grassy places and in pine forests.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1137 Shillong, 3754 Elephant falls (Khasi Hills).

Eulalia quadrinervis (Hack.) O. Kuntze Rev. Gen. Pl. 2: 775. 1891; Bor in Fl. Assam 5: 337. 1940 et Grass. Burm. Ceyl. Ind. Pak. 156. 1960. - - Pollinia quadrinervis Hack. in DC. Monogr. Phan. 6: 158. 1889; Hook.f. Fl. Brit. India 7: 110. 1896.

Culms up to 1 m high, erect, glabrous. Leaves 20-40 x 0.5 cm, pubescent; sheaths glabrous below, ligule membranous, truncate. Racemes digitate or subdigitate, 2-6, covered with golden white or yellow hairs. Spikelets lanceolate, 5-6 mm long, hairy. Lower glumes lanceolate, as long as spikelets, hairy, 4-nerved, apex truncate; upper glumes as long as the lower glumes,

glabrous, shining, 3-nerved. Lower florets empty. Upper florets hermaphrodite: lemma hyaline, 3-5 mm long, 2-lobed, awns 1.5-2 cm long. Palea linear, hyaline, papyraceous; lodicules shortly hairy. Stamens 3, anthers yellow. Stigmas 2, feathery.

Common in forests at foothils. Some specimens from Meghalaya show 1-nerved upper glumes.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1141 Shillong, Pongtung (Khasi Hills); 1483 Garumpani (Jaintia Hills).

Eulalia trispicata (Schult.) Henr. in Blumea 3: 453. 1940; Bor Grass. Burm. Ceyl. Ind. Pak. 157. 1960; Babu Herb. Fl. Dehra Dun 616. 1977. - - Andropogon trispicatus Schult. Syst. Veg. 2: 452. 1824.

Culms tufted, 0.5-1 m high, shining, glabrous. Leaves 10-60 x 0.5-0.8 cm, hairy, apex setaceous, margin scabrid, usually brown spotted; sheaths striate, loose, hairy. Ligules tuft of silky hairs. Inflorescence digitate or subdigitate racemes, 4-16 cm long, rhachis very hairy. Pedicelled spikelets 2.5-3.5 mm long, acute, silky, yellow: lower glumes ciliate, obscurely 2-nerved; upper glumes similar to the lower one, hairy hyaline. Lemmas reduced to 2, small, linear lobes, long awned inbetween the lobes. Palea absent. Lodicules 2, linear-lanceolate, hyaline, ciliate, near the apex. Stamens 3. Stigmas 2, plumose.

Common in pine forests of Shillong and other places.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1171 Shillong, 1297 Pontung (Khasi Hills).

Festuca Linn.

Festuca leptopogon Stapf in Hook.f. Fl. Brit. India 7: 354. 1896; Bor in Fl. Assam 5: 82. 1940 et Grass. Burm. Ceyl. Ind. Pak. 538. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 364. 1966.

Annuals. Culms tufted or solitary, 0.5-1 m high, glabrous. Leaves linear-lanceolate, 10-30 x 0.5-0.8 cm tapering to a fine point, glabrous, scabrid only on the thick margin; sheaths loose, glabrous. Ligule membranous, truncate, 1-1.5 mm long. Panicles 20-30 cm long. Axis angular, scabrid. Spikelets 2-3-flowered, acute, long awned. Rhachilla disarticulating above the glumes. Lower glumes small, wedge shaped, 1 mm long, 1-nerved, margin hyaline; upper glumes similar to the lower glumes, 2-3 mm long, 3-nerved. Lemmas 7-8 mm long, lanceolate, 2-lobed with a long scabrid awn from the sinus. Paleas 2-keeled, as long as lemmas, scabrid on the keels. Lodicules 2, Stamens 3. Stigmas 2, feathery.

Common mostly along the banks of ponds, lakes, ditches and embankment of paddy fields.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1658 Shillong.

Garnotia Brongn.

Perennials, rarely annuals. Leaves narrow, acuminate, very hairy. Ligule a ciliate rim of hairs. Inflorescence a panicle. Spikelets 1-flowered, falling entire from the pedicels. Lower and upper glumes similar, 3-nerved, entire or 2-toothed, acute, rarely awned. Lemmas membranous, 3-5-nerved, awned. Paleas 2-nerved. Lodicules 2. Stamens 3. Styles 2. Caryopsis linear, oblong.

K E Y T O S P E C I E S

1a. Leaves with a dense ring of hairs behind the ligule . . . . . fergusonii

1b. Leaves without ring of hairs behind the ligule . . . . . stricta

Garnotia fergusonii Trin. in Journ. Bot. 27: 170. 1889; Hook.f. Fl. Brit. India 7: 244. 1896; Bor Grass. Burm. Ceyl. Ind. Pak. 568. 2960.

Annuals. Culms tufted, 20-30 cm high, simple or branched. Leaves 10-20 x 0.5 cm, pointed, base narrow, articulate with the sheath. Blades densely hairy on the dorsal surface, midrib prominent, white; sheaths striate, hairy with a dense ring of hairs behind the ligule. Panicles 10-20 cm long. Axis glabrous.

Spikelets bearded at base, dimorphic, upper one reduced into folded lemma. Lower glumes linear, acute, 4 mm long with long awn, 3-nerved, margin scabrid; upper glume similar to the lower ones, Lemma larger than the glumes, obscurely 1-nerved, awn up to 1 cm long, geniculate, scabrid. Palea equal to, or slightly smaller than the glumes, nerveless. Lodicules 0. Stamens 3, anthers linear, 1.2 mm long. Stigmas feathery.

Rare, collected only once from Shillong, on rocks along the streams.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1205 Shillong.

Garnotia stricta Brongn. in Dupper. Voy. Coq. Bot. 133. t. 21. 1831; Hook.f. Fl. Brit. India 7: 243. 1896; Bor Grass. Burm. Ceyl. Ind. Pak. 569. 1960.

Annuals, Culms tufted, erect, branched, 50-80 cm high, glabrous. Leaves ovate-lanceolate, 5-10 cm long, hairy, tapering to a fine point; sheaths loose, glabrous. Ligule membranous, apex ciliate. Panicles of fasciculate racemes. Rhachis and branchlets scabrid, angular. Spikelets linear, acute, usually brown or pale green, 4-5 mm long, bearded at base: lower glumes 4 mm long, 3-nerved, apex 2-toothed, awned; upper glumes similar to the lower one, 3-nerved, awned. Lemmas hyaline, broad, ovate, acute, nerveless or obscurely 3-nerved, apex 2-toothed with a long awn, 1.5 mm long. Palea hyaline, obtuse. Lodicules 0.

Stamens 3. Styles 2. Caryopsis elongate.

Occasional on rocks in the beds of river and streams, in forests.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1263 Sohkha (Jaintia Hills).

Hackelochloa O. Kuntze

Hackelochloa granularis (Linn.) O. Kuntze Rev. Gen. Pl. 776. 1891; Bor in Fl. Assam 5: 441. 1940 et Grass. Burm. Ceyl. Ind. Pak. 159. 1960. - - Cenchrus granularis Linn. Mant. 2: App. 575. 1771; Babu Herb. Fl. Dehra Dun 617. 1977. - - Manisuris granularis Linn.f. Nov. Gram. Gen. 40. 1779; Hook.f. Fl. Brit. India 7: 159. 1896.

Annuals. Culms erect, sometimes geniculate from base, branched, glabrous, striate. Leaves linear-lanceolate, 2-15 x 0.5-1.5 cm very hairy with tubercle based hairs, amplexicual at base, apex acute; sheaths loose hairy. Ligule ciliate. Spikes axillary, jointed; spikelets 2-3 mm long, globose. Lower glumes subequal, ribbed, many-nerved; upper glumes broad, obtuse, 3-nerved; lemma nerveless. Palea coriaceous. Stamens 3. Styles 2. Caryopsis globose or rounded with distinct ridges and furrows.

Frequent under shrubs in open areas, also in fallows.

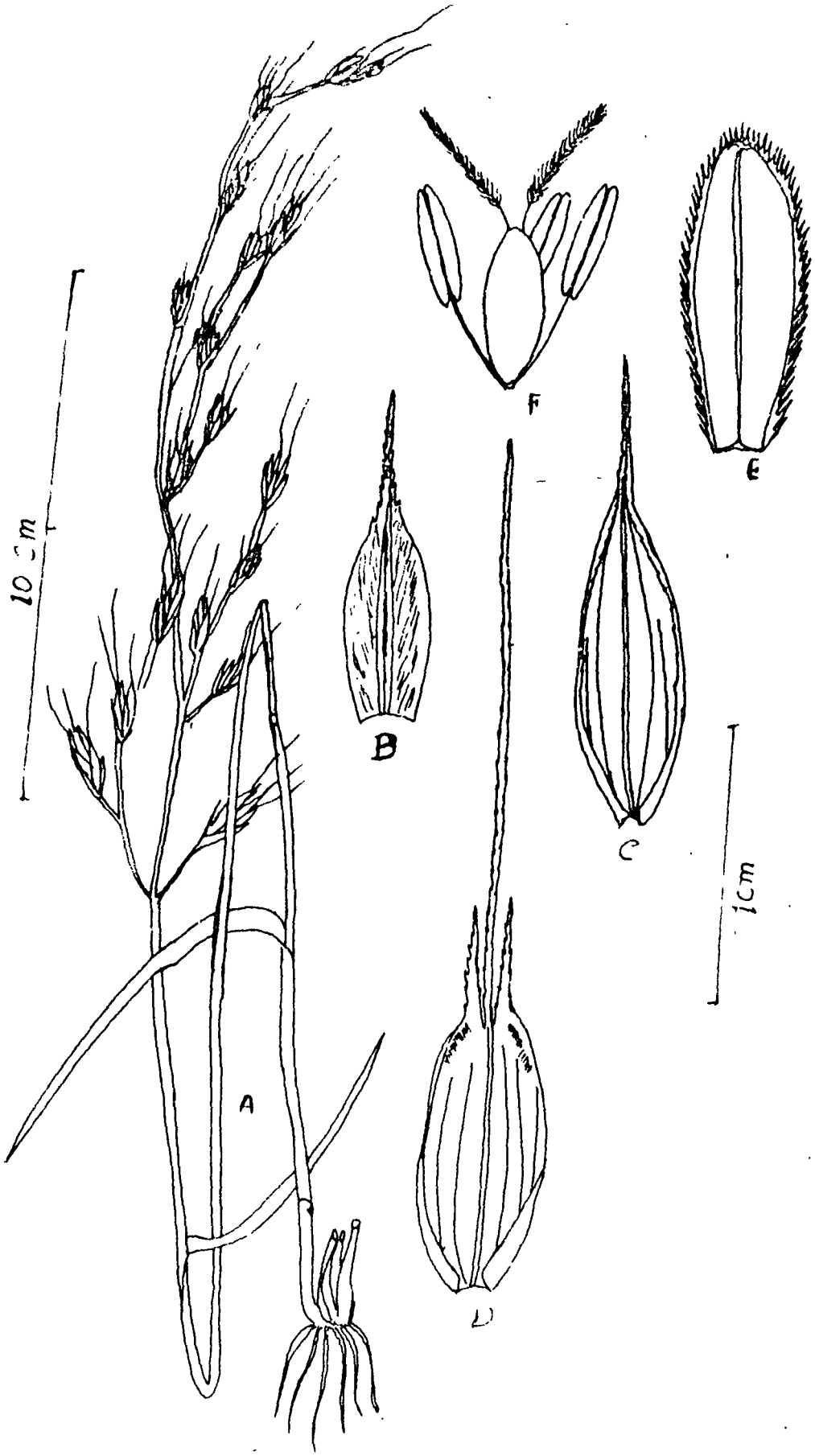


Plate 50 Helictotrichon asperum (Munro) Bor A. Habit, B. Lower Glume, C. Upper Glume, D. Lemma, E. Palea, F. Gynoecium with Androecium.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1090 Barapani, 1160 Shillong, 1754 Burnihat (Khasi Hills).

Helictotrichon Bess. ex R. & S.

Helictotrichon asperum (Munro) Bor in Ind. For. Rec. n.s. 1, Bot. 68. 1838; in Fl. Assam 5: 132. 1940 et Grass. Burm. Ceyl. Ind. Pak. 438. 1960. - - Avena aspera Munro ex Thw. Enum. Pl. Zeyl. 372. 1864; Hook.f. Fl. Brit. India 7: 277. 1896 (Plate 50).

Annuals. Culms robust, tall 0.5-2 m high, glabrous. Leaves 50 x 0.5-1 cm, linear, scabrid on nerves; sheaths loose, glabrous or hairy on the mouth. Ligule membranous, 1-2 mm long, truncate. Panicles 20-30 cm long, spreading. Spikelets 1-1.2 cm long. Lower glumes linear 6-8 mm long; upper glumes as long as spikelets, 7-nerved, aristate, scabrid. Lemmas as long as the upper glumes, 7-nerved, median nerve projecting into two aristae. Palea small, villous at the keels. Stamens 3, anthers yellow. Styles 2, stigmas feathery.

Common in grasslands and in fallows.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1005, 3021 Shillong.

Hemarthria R. Br.

Hemarthria compressa (Linn.f.) R. Br. Prodr. 207. 1810; Bor in Fl. Assam 5: 436. 1940 et Grass. Burm. Ceyl. Ind. Pak. 161. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 365. 1966; Babu Herb. Fl. Dehra Dun 618. 1977. - - Rottboellia compressa Linn. f. Suppl. 114. 1781; Hook.f. Fl. Brit. India 7: 153. 1896.

Perennials. Culms prostrate or decumbent, spongy or flaccid, glabrous. Leaves linear, flaccid, margin scabrid, 5-20 x 0.4-0.8 cm; sheaths loose, much shorter than the internodes, glabrous, margin membranous, with cilia at the throat; ligule a truncate membrane. Racemes 6-15 cm long, exserted from the sheath, solitary or fascicled above. Rhachis jointed, joints shorter than the spikelets. Pedicelled spikelets male, fused to the rhachis. linear-lanceolate, 4-5 mm long, acute. Lower glumes as long as the spikelets, acute, thick, nerves obscure, 2-toothed, upper glumes subulate, 2-3 mm long, aristate, hyaline. Lower florets empty; lemma 3 mm long, oblong, hyaline, obtuse, 2-nerved. Upper florets hermaphrodite; lemma ovate-oblong, subobtuse, hyaline, 2 mm long. Stamens 3. Styles 2, stigmas purple, plumose.

Grows in marshes and in abandoned paddy fields, etc.

Fls. & Frts. : June to January,

Specimens examined: Myrthong 1619 Dawki (Jaintia Hills); 2041 Burnihat (Khasi Hills); 1916 Agarobadha (Garo Hills).

Heteropogon Pers.

Heteropogon contortus (Linn.) P. Beauv. ex R. & S. Syst. Veg. 2: 836. 1817; Bor in Fl. Assam 5: 402. 1940 et Grass Burm. Ceyl. Ind. Pak. 163. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 365. 1966; Babu Herb. Fl. Dehra Dun 618. 1977. - - Andropogon contortus Linn. Sp. Pl. 1045. 1753; Hook.f. Fl. Brit. India 7: 199. 1896.

Annuals or perennials. Culms erect or geniculate from the base, simple or branched, 10-90 cm high. Leaves tapering to a fine point, glabrous or with few sparse tubercle-based hairs near the margin; sheaths loose, glabrous. Ligule membranous or ciliate. Racemes terminal, 5-10 cm long, with dense twisted awns at the apex. Pedicels glabrous, 1 mm long. Spikelets lanceolate, 1 cm long. Glumes equal, truncate, hairy, 9-nerved. Lower florets reduced to a lanceolate nerveless lemma. Lemma of upper florets nerveless, produced to a long geniculately hairy awn, awns 6-10 cm long; palea very small. Lodicules 2, hyaline, nerveless. Stamens reduced. Stigmas exserted on the sides of the awn. Caryopsis subterete.

Common in open areas in grasslands at foothills. It is a fodder grass before the appearance of spikes.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1193 Shillong (Khasi Hills); 1469 Tura (Garo Hills).

Hierochloe R. Br.

Hierochloe khasiana Cl. ex Hook.f. Fl. Brit. India 7: 223. 1896; Bor in Fl. Assam 5: 167. 1940 et Grass. Burm. Ceyl. Ind. Pak. 441. 1960.

Annuals. Culms erect from a slightly geniculate base, 20-40 cm high, glabrous. Leaves linear, tapering to blunt apex, blades 5-15 cm long, glabrous; sheaths loose, glabrous, margin hyaline, glabrous. Ligule a long white truncate membrane. Panicles of false spikes, 8-10 cm long, contracted. Spikelets ovate-oblong, truncate, 4.5-5 mm long. Lower glumes ovate-lanceolate, 3-nerved, acute, glabrous, as long as the spikelets. Upper glumes similar to the lower glumes. Lemmas shorter than the glumes, margin hairy, rounded or depressed at apex, with a stout geniculate awn. Palea yellow, nerveless, striate with stout geniculate awn at the back. Stamens 2-3. Styles 2, stigmas flexuous.

Frequent on banks of streams, rivers and embankments of paddy fields.

Fls. & Frts. : March to October.

Specimens examined: Myrthong 1518 Shillong.

Holcus Linn.

Holcus lanatus Linn. Sp. Pl. 1048. 1753; Hook.f. Fl. Brit. India 7: 274. 1896; Bor in Fl. Assam 5: 134. 1940 et Grass. Burm. Ind. Pak. 443. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 365. 1966.

Annuals. Culms erect, 50 cm high, hairy all over. Leaves linear, densely hairy, 10-25 x 0.5-0.8 cm, margin ciliate; sheaths loose, pubescent, pink at base. Ligule a long white membrane, 2-3 mm long. Panicles condensed or pyramidal, 5-10 cm long. Spikelets oblong, 4 mm long, pinkish green. Glumes unequal, 1-nerved, acute, scabrid on the dorsal nerves and on the margin; upper glumes broadly ovate with rounded apex and a short arista, dorsal keels scabrid, 3-nerved. Lower lemmas linear with a hooked awn at the back, the awn concealed within the glumes. Lodicules hyaline. Stamens 3. Styles 2, stigmas plumose.

Collected only once in Upper Shillong near the Potato Research Institute. Probably an introduction from other areas.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1850 Upper Shillong.

Hordeum Linn.

Hordeum vulgare Linn. Sp. Pl. 84. 1753; Hook.f. Fl. Brit. India 7: 371. 1896; Bor in Fl. Assam 5: 86. 1940 et Grass. Burm. Ceyl. Ind. Pak. 677. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 365. 1966.

Annuals. Culms erect, 20-80 cm high, glabrous. Leaves linear-lanceolate, tapering to the apex, base auricled; sheaths loose, glabrous, margin membranous. Ligule membranous, 1 mm long. Panicles 2-10 cm long, contracted. Spikelets in threes, 1-flowered.

Glumes 2, rigid, narrow, 5-nerved, apices produced to long awns. Lemmas long, up to 1 cm long, rounded on the back, 5-nerved, produced to long straight or recurved awn. Palea as long as lemma. Lodicules 2. Stamens 3, anthers yellow. Styles 2, stigmas feathery. Caryopsis compressed on one side, acute, smooth.

Cultivated; often seen as an escape along drains or on the banks of streams, rivers etc.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 1509 Shillong.

Hymenachne P. Beauv.

Hymenachne assamica Hitch. in Lingnan Sci. Journ. 7: 222. 1929; Bor in Fl. Assam 5: 219. 1940 et Grass. Burm. Ceyl. Ind. Pak. 313. 1960;- - Panicum assamicum Hook.f. Fl. Brit. India 7: 90. 1896.

Annuals. Culms ascending from geniculate base, rooting at lower nodes. Leaves lanceolate, 5-20 cm long, glabrous, sheaths loose; ligule membranous. Spikes 5-10 cm long, cylindric, branchlets short, adpressed. Pedicels stout, swollen at the tip. Spikelets ovate, acute, 2.5 mm long. Lower glumes orbicular, clasping round the base, 3-nerved; upper glume as long as the lower glume, 5-nerved. Lower florets barren, lemmas 2-3 mm long, 5-nerved. Upper florets hermaphrodite; lemmas 2-3 mm long, obscurely 3-nerved. Stamens 3. Styles 2, stigmas feathery.

A weed of paddy fields in lower elevations and in marshes.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1385 Nongpoh, 1738 Burnihat (Khasi Hills).

Ichnanthus P. Beauv.

Ichnanthus vicinus (F.M. Bail.) Merr. in Enum. Philip. Fl. Pl. 1: 70. 1923; Bor in Fl. Assam 5: 220. 1940 et Grass. Burm. Ceyl. Ind. Pak. 314. 1960. θ - Panicum vicinum F. M. Bail. Syn. Queens. Fl. Suppl. 3: 82. 1890.

Perennials. Culms 30-60 cm high, decumbent, rooting at lower nodes, glabrous. Leaves lanceolate, acute, 4-10 x 1-3 cm, scabrid on the nerves; sheaths loose, margin hairy. Ligule obscure. Panicles 10-15 cm long, branched, erect or drooping. Pedicels shorter than the spikelets, scabrid. Spikelets lanceolate, acute, compressed, 3-5 mm long. Lower florets barren or male: lower glumes ovate-lanceolate, 2-3 mm long; upper glumes 3 mm long, 5-nerved, ovate. Upper florets hermaphrodite: lower glumes oblong-lanceolate, 3-4 mm long, subhispid, 3-nerved; upper glumes ovate, subacute, 4 mm long, 5-7-nerved. Lemmas 2-3 mm long, glabrous. Palea as long as lemmas, obtuse, ciliate at the apex. Stamens 3, anthers linear, yellow. Stigmas 2, plumose.

Common as forest undergrowth.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1255 Sohkha (Jaintia Hills); 1365 Lailad (Khasi Hills).

Imperata Cyr.

Imperata cylindrica (Linn.) P. Beauv. Ess. Agrost. 165. 1812; Bor in Fl. Assam 5: 310. 1940 et Grass. Burm. Ceyl. Ind. Pak. 169. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 366. 1966; Babu Herb. Fl. Dehra Dun 619. 1977. - - Lagurus cylindricus Linn. Syst. Nat. ed. 10, 878. 1759. - - Imperata arumdinacea Cyr. Pl. Rar. Neap. 2: 26. 1792; Hook.f. Fl. Brit. India 7: 106. 1896.

Vern.- 'Rawjia' (K).

Perennials. Rootstock creeping. Leaves linear, ensiform, tufted, 30-50 x 1-4 cm, base narrowed to a sheathing base, apex acute, margin scabrid; sheaths loose, longer than the internodes margin villous; ligules membranous, ciliate above. Spikes contracted, cylindric, densely covered with white cottony hairs. Pedicels slender, swollen at the tip, ciliate at base. Spikelets 3 mm long, lower glumes lanceolate as long as spikelets, 3-5-nerved, hayline at apex; upper glumes equal to the lower glumes. Lower floret empty; lemmas hyaline, 2 mm long, nerveless, denticulate, ciliate. Upper florets hermaphrodite: lemmas similar to that of lower floret. Palea hyaline, nerveless. Stamens 2, anthers linear, embedded in cottony hairs of the spikes. Styles 2, stigmas purple, plumose.

Abundant in all types of soils, specially in forest clearings. One of the pioneer grasses to occupy the cleared areas. This grass is extensively used for thatching purposes.

Fls. & Frts. : October to April.

Specimens examined: Myrthong 1035 Shillong, 1756 Burnihat (Khasi Hills); 1595 Jowai (Jaintia Hills).

Isachne R. Br.

Annuals or perennials. Culms simple or branched. Leaves linear-lanceolate. Panicles sparingly or much divided; spikelets elliptic or globose, awnless, 2-flowered. Glumes equal or nearly so, 5-9-nerved or the lower glume 3-nerved. Lemmas similar, finely membranous, obscurely 5-7-nerved. Palea similar to the lemma but 2-nerved. Lodicules 2. Stamens 3. Styles 2, short. Caryopsis elliptic, plano-convex with basal hilum.

K E Y T O S P E C I E S

1a. Lemmas disimilar; spikelets separated by minute rhachilla . . . . . miliacea

1b. Lemmas similar in shape and texture; florets almost contiguous.

2a. Spikelets 0.8-2 mm long.

3a. Leaf-blades ovate-lanceolate, glabrous; spikelets 0.8-1 mm long . . . . clarkei

3b. Leaf-blades linear-lanceolate, scabrid; spikelets 1-2 mm long.

4a. Leaf-sheaths rough; panicles less than 8 cm long. . . . . scabrosa

4b. Leaf-sheaths glabrous; panicles 8-35 cm long . . . . albens

2b. Spikelets 2-2.5 mm long; panicles up to 10 cm long. . . . . himalaica

Isachne albens Trin. Sp. Gram. 1, t. 85. 1826; Hook.f. Fl. Brit. India 7: 22. 1896; Bor in Fl. Assam 5: 196. 1940 et Grass. Burm. Ceyl. Ind. Pak. 579. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 366. 1966.

Perennials. Culms erect or spreading, diffuse, 0.5-1.5 m high. Leaves linear-lanceolate, rough, 10-20 x 0.5-2 cm, margin cartilaginous; sheaths loose, glabrous, hairy on the margin, specially near the mouth. Ligule a fringe of stiff hairs. Panicles 10-30 cm long, contracted or spreading. Branchlets and pedicels capillary. Spikelets globose, 1 mm long or more; glumes equal, orbicular, obscurely nerved. Palea shorter than lemma. Lower florets usually male. Upper hermaphrodite. Stamens 3. Styles 2. Caryopsis obovate.

Common under bushes along banks of streams, rivulets, marshes, etc.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1038 Shillong.

Isachne clarkei Hook.f. Fl. Brit. India 7: 24. 1896; Bor in Fl. Assam 5: 195. 1940 et Grass. Burm. Ceyl. Ind. Pak. 579. 1960.

Slender grasses. Culms geniculate from base, rooting at lower nodes, glabrous, 10-50 cm high. Leaves ovate-lanceolate, subobtuse, blades 1-8 cm long, scabrid, margin ciliate; sheaths scabrid. Ligules hairy. Panicles ovate-lanceolate. Spikelets globose, 1 mm long. Glumes herbaceous, many-nerved, truncate, ciliate. Lemmas similar to glumes. Lower florets male. Stamens 3. Upper florets hermaphrodite. Styles 2, stigmas feathery.

Common in marshy places.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1082 Shillong.

Isachne himalaica Hook.f. Fl. Brit. India 7: 23. 1896; Bor in Fl. Assam 5: 197. 1940 et Grass. Burm. Ceyl. Ind. Pak. 581. 1960.

Culms slender or stout, glabrous, 20-80 cm high. Leaves linear, ensiform sub-obtuse, 5-20 x 0.5-0.8 cm, midrib glabrous or scabrid, margin serrate; sheaths glabrous, ciliate on the margin. Ligule a ring of stiff hairs. Panicles 2-8 cm long, spikelets globose, 1-2 mm long; lower glumes ovate, ciliate on the dorsal surface, many-nerved; upper glumes orbicular, many-nerved. Lemmas orbicular, membranous, nerveless. Palea similar to lemmas; lodicules glabrous, Lower florets male, stamens 3. Upper ones hermaphrodite, styles 2. Stigmas feathery.

Common in marshes, ditches and banks of streams, rivers etc.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1023 Shillong, 1147 Burnihat (Khasi Hills).

Isachne miliacea Roth. Nov. Pl. Sp. 58. 1821; Hook.f. Fl. Brit. India 7: 25. 1896; Bor in Fl. Assam 5: 198. 1940 et Grass. Burm. Ceyl. Ind. Pak. 582. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 366. 1966.

Vern.-'Batnamlang' (K).

Annuals. Culms slender, very variable, prostrate and then erect, branched at nodes, 10-25 cm high, glabrous or hairy at nodes. Leaves ovate-lanceolate, 1-2.5 x 0.5-1 cm, glabrous or sparsely hairy. Sheaths ciliate on margins. Ligule a ring of stiff hairs. Panicles lax. Spikelets distant, contracted, branches and padicels capillary. Spikelets globose, 1-1.5 mm long. Lower glumes hemispherical or orbicular, ciliate on margins, 5-7-nerved; upper glumes similar to lower glumes. Lower florets male: lemmas broad, ovate, incurved, nerveless, longer than glumes. Palea thick, embracing the stamens. Stamens 3, anthers brown, 1 mm long. Upper florets female or hermaphrodite: lemmas similar to that of lower floret, but smaller. Palea glabrous, thick, embracing the 2 feathery stigmas. Caryopsis plano-convex.

Common in marshes and in abandoned fields.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1372 Lailad, 1734 Burnihat (Khasi Hills); 1425 Baghmara (Garo Hills).

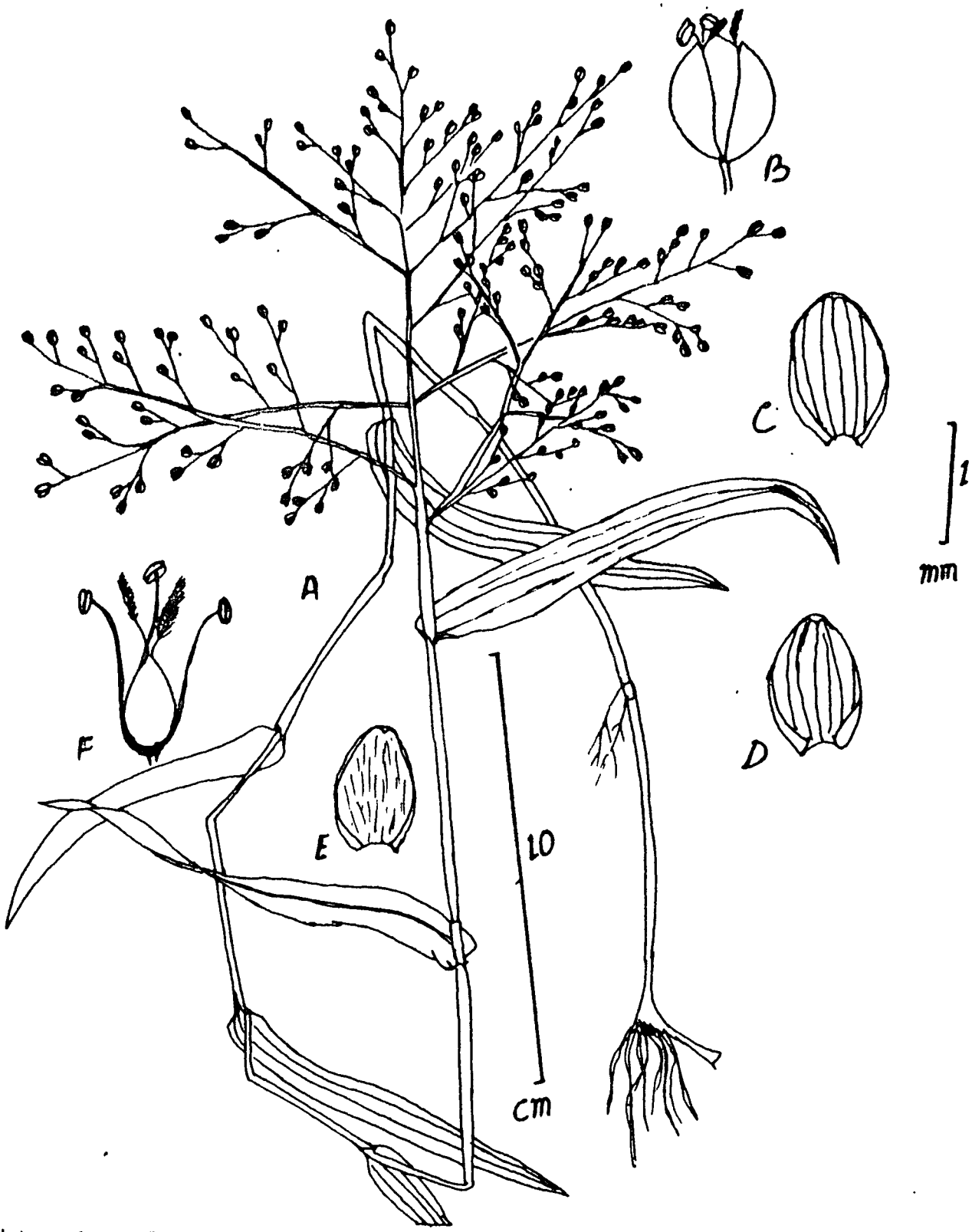


Plate 51 Isachne scabrosa Hook. f. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Pistil with Androecium.

Isachne scabrosa Hook.f. Fl. Brit. India 7: 23. 1896; Bor in Fl. Assam 5: 196. 1940 et Grass. Burm. Ceyl. Ind. Pak. 582. 1960 (Plate 51).

Perennials. Culms erect from a geniculate base, glabrous, up to 1 m high. Leaves scabrid with distinct midribs, tapering to a fine point; sheaths loose, margin ciliate. Ligule a ring of stiff hairs. Panicles lax, 5-15 cm long. Branches flexuous up to 8 cm long. Rhachilla and pedicels capillary. Spikelets globose, 1 mm long. Glumes ovate, many-nerved, hairy on the back. Lower florets male: lemma orbicular. Palea longer than lemma. Stamens 3. Upper florets female or hermaphrodite: lemma similar to that of lower florets. Styles 2, stigmas feathery.

Common in ditches and along the banks of streams, and in marshes.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1107 Shillong, 1327 Barapani, 1793 Pariong (Khasi Hills).

Ischaemum Linn.

Perennials, rarely annuals. Culms usually decumbent at base. Young leaves usually convolute and flat at maturity. Inflorescence a spiciform raceme of 2 or more racemes. Rhachis fragile, many jointed. Spikelets 2-nate, one sessile and the other pedicelled, similar or differing in shape or sex, both deciduous, usually the pedicelled ones falling early, both

spikelets 2-flowered, lower florets males, rarely hermaphrodite and the upper hermaphrodite. Glumes equal or nearly so, muticous, rarely awned, margin inflexed, keeled. Lower lemma male; upper lemma hermaphrodite, 2-cleft, awned from the sinus, rarely muticous, 3-nerved. Paleas hyaline. Lodicules cuneiform, quadrangular. Stamens 3, sometimes reduced. Stigmas oblong or linear. Caryopsis dorsally compressed.

K E Y T O S P E C I E S

1a. Margins of the lower glumes of the sessile spikelets narrowly and evenly infolded from base to apex.

2a. Lower glume of sessile spikelet crustaceous with transverse rugosities . . . . . rugosum

2b. Lower glume of sessile spikelet coriaceous, without transverse rugosities . . . . . goebellii

1b. Margins of the lower glumes of sessile spikelets expanded below the middle.

3a. Keels of upper glume of sessile spikelets winged above the middle . . . indicum

3b. Keels of upper glumes of sessile spikelets not winged above the middle.

4a. Lower glumes of sessile spikelets uniform in texture throughout, hirsute in the upper half . . . . . hirtum

4b. Lower glumes of sessile spikelets not uniform in texture, subcoriaceous below and herbaceous above . . . timorense

Ischaemum goebelii Hack. in Ost. Bot. Z. 51: 149. 1901; Bor Grass. Burm. Ceyl. Ind. Pak. 179. 1960.

Annuals. Culms erect, 30-60 cm high, glabrous. Leaves linear, lanceolate, acuminate, hairy on the dorsal surface. Sheaths loose, striate, glabrous. Ligule membranous, truncate, 2-3 mm long. Inflorescence of 2-spiciform racemes, 3-6 cm long, adpressed to one another. Rhachis fragile, pedicels 2-3 mm long, trigonous, hairy at the angles. Spikelets 4-7 mm long, violet or green, callus short. Lower glumes ovate, 3-5 mm long, 5-7-nerved, nerves prominent near the summit, apex 2-toothed, winged; upper glumes ovate-lanceolate, shortly aristate, compressed above, scabrid, nerves obscure. Lower florets male: lemmas 3-5 mm long, hyaline, membranous, lanceolate, acute, nerves obscure. Paleas 3-5 mm long, hyaline, 2-nerved. Stamens 3. Upper florets hermaphrodite: lemmas 2-3 mm long, 2-lobed, awned, awns long, up to 1.2 cm long, arising from the sinus of the lemma. Palea 2-3 mm long, 2-nerved. Stamens 3. Stigmas 2, feathery.

Common in open areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1428 Baghmara (Garo Hills); Deka 20367 Jowai, Sherma 20368 Dawki, 12582 Sohkha (Jaintia Hills); 10413 Shillong (Khasi Hills) (ASSAM).

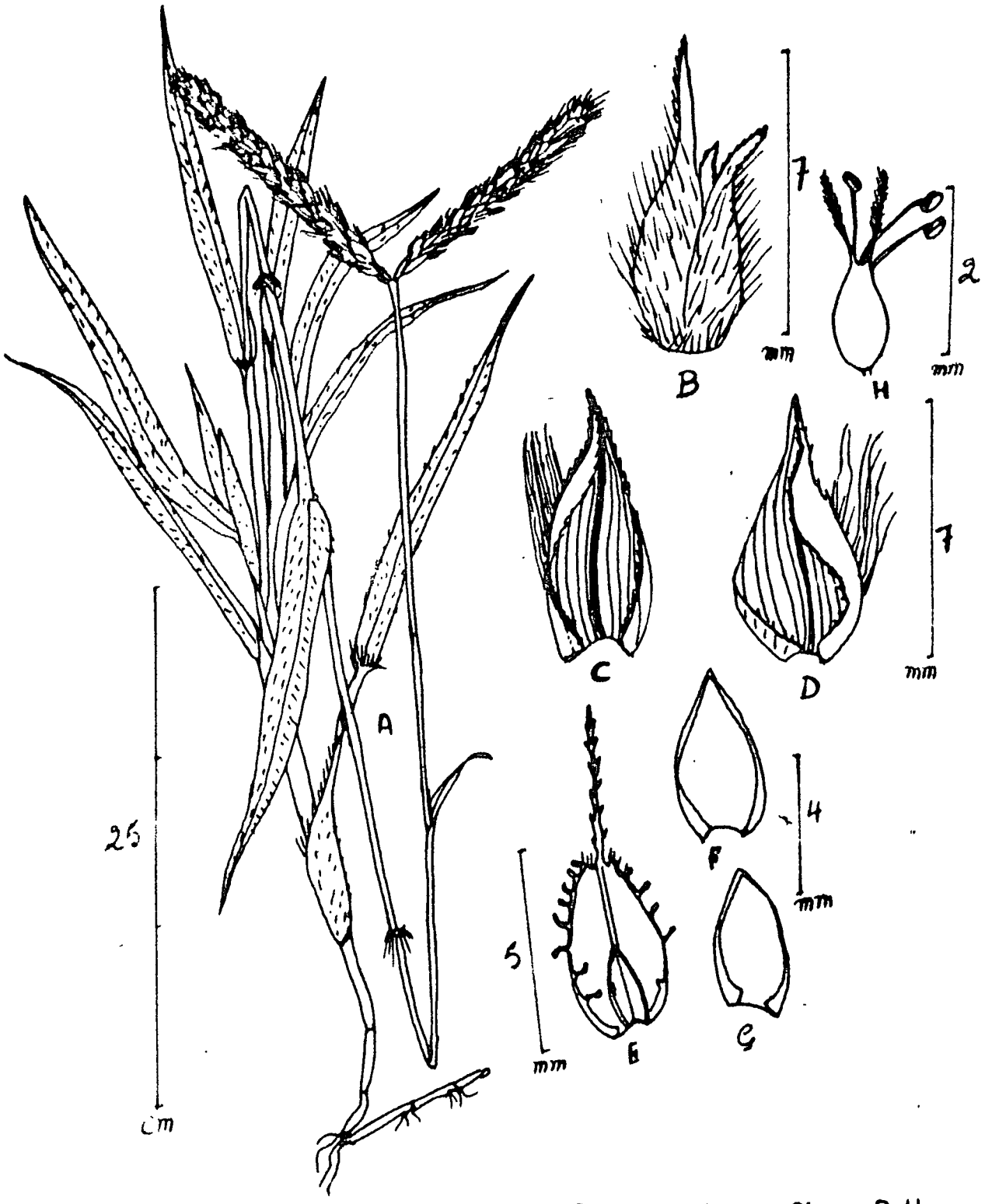


Plate 52 Ischaemum hirtum Hack.. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma & Palea F. Lodicule, H. Gynoecium & Androecium.

Ischaemum hirtum Hack. in DC. Monogr. Phan. 6: 228.1889; Hook.f. Fl. Brit. India 7: 135. 1896; Bor in Fl. Assam 5: 427. 1940 et Grass. Burm. Ceyl. Ind. Pak. 179. 1960 (Plate 52).

Annuals. Culms rooting at lower nodes, glabrous, 30-60 cm high. Leaves lanceolate, acute, 5-20 x 0.5-1 cm, margin hairy, with tubercle based hairs. Sheaths loose, striate, pubescent. Ligule membranous, truncate. Inflorescence of 2 spiciform racemes, rarely of 3 racems, hairy, Spikelets 2-nate, one sessile and the other pedicelled. Pedicelled spikelets embracing the sessile spikelets. Sessile spikelets densely bearded, 5-8 mm long, variegated; lower glumes ovate, acute, 7 mm long, hirsute on dorsal side, many-nerved; upper glumes as long as the lower ones, but not hirsute, scabrid only on the dorsal nerve, 3-nerved, ending in a short arista. Lower florets male or empty; lemma membranous, 4 mm long, margin ciliate. Palea broad, hyaline. Stamens 3. Upper florets hermaphrodite; lemmas 4 mm long, 2-lobed, awned, Stamens 3. Stigmas 2, feathery.

Common in open areas, specially along embankment of paddy fields and water channels.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1036 Shillong.

Ischaemum indicum (Houtt.) Merr. in Journ. Arn. Arbor. 19: 320. 1938; Bor Grass. Burm. Ceyl. Ind. Pak. 180. 1960. - - Phleum indicum Houtt. Nat. Hist. 2: 198. t. 90. f. 2. 1782.

Culms 30-60 cm high, rooting at base, hairy at nodes. Leaves 6-15 x 0.5-0.8 cm, subacute, hairy with tubercle-based hairs, margin scabrid, sheaths loose, hyaline, shorter than the the internodes. Ligule a thin membrane. Inflorescence of 2 spiciform racems, 4-5 cm long; rhachis winged, jointed. Spikelets 4-5 mm long; lower glumes as long as spikelets, ovate, upper portion winged, expanded, apex 2-toothed, many-nerved, callus pointed, margin scabrid; upper glumes linear-lanceolate, aristate, 6 mm long, including arista, obscurely 3-nerved. Lower florets male or neuter: lemma 4 mm long, hyaline, ovate-lanceolate, 3-nerved, acute, margin ciliate. Palea divided towards the middle, 3-nerved, lobes obscure. Upper florets hermaphrodite: lemma ovate-lanceolate, hyaline, 3-nerved. Palea aristate. Stamens 3. Styles 2, stigmas feathery.

Common in marshes and along streams.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1275 Lamin (Jaintia Hills).

Ischaemum rugosum Salisb. Icon. Stirp. Rar. 1: t. 1. 1791; Hook.f. Fl. Brit. India 7: 127. 1896; Bor in Fl. Assam 5: 423. 1940 et Grass. Burm. Ceyl. Ind. Pak. 184. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 366. 1966; Babu Herb. Fl. Dehra Dun 620. 1977 (Plate 53).

Perennials. Culms tufted, geniculate at base, 50-80 cm high.

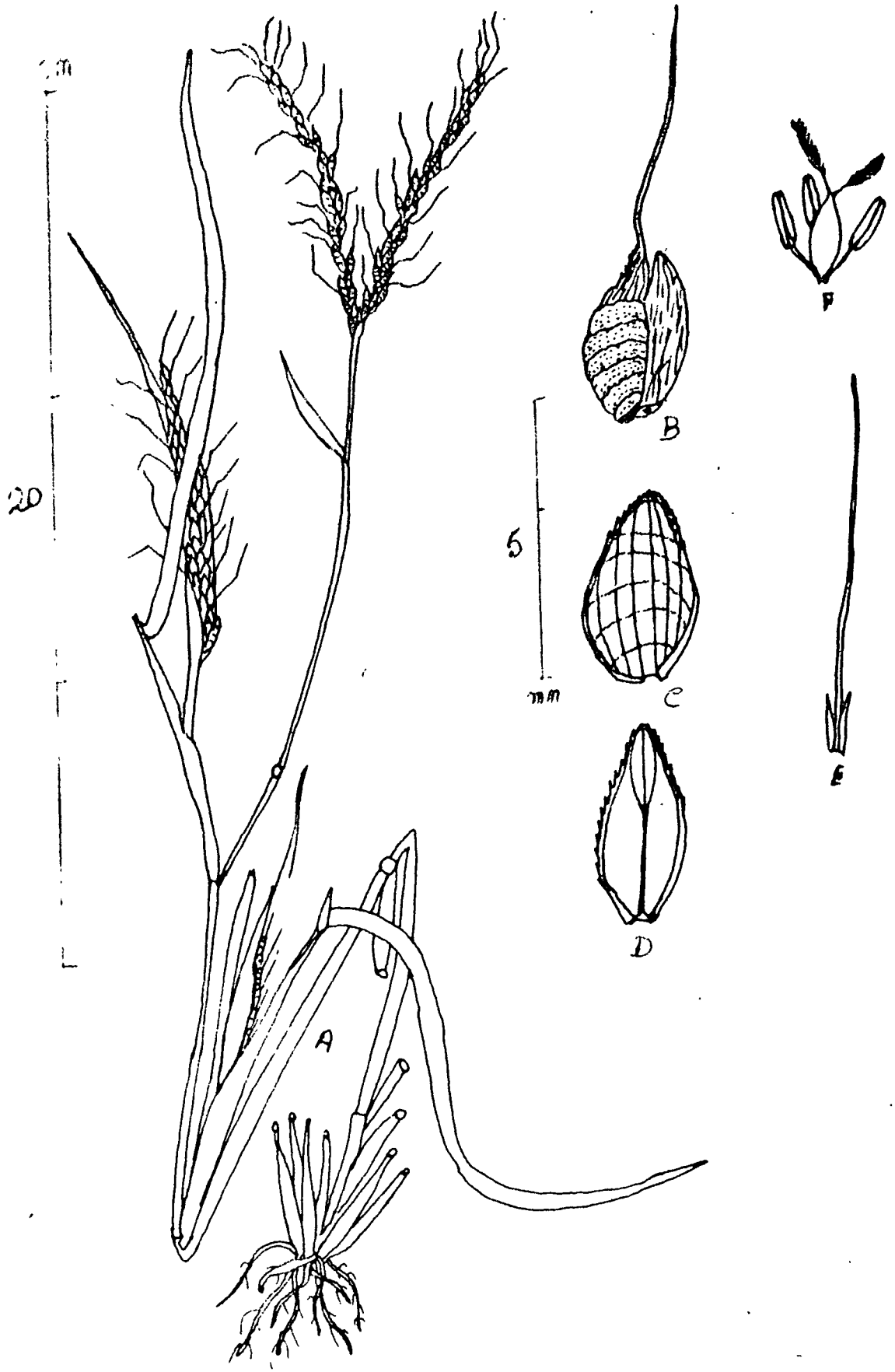


Plate 53 Ischaemum rugosum Salisb. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Gynoecium with Androecium.

Leaves 10-20 cm long, acute, margin scabrid; sheaths losse. Ligule membranous, ovate, 2 mm long. Panicles of 2 false racemes enclosed by the young spathe-like leaves, racemes 4-6 cm long. Spikelets sessile or pedicelled, 4-5 mm long, crustaceous, rugose. Sessile spikelets 4.8 mm long; lower glumes ovate, many-nerved, scabrid, scabrid on the keels; upper glumes smaller than the lower ones, obscurely nerved, keels scabrid. Lemmas reduced to a thin membrane, 2-lobed with a stout geniculate awn in between the lobes, base of the awn abruptly truncate. Palea ovate, hyaline, larger than the lemma. Lodicules hyaline. Stamens 3, anthers sagittate. Ovary enclosed by lodicules. Styles 2, stigmas feathery.

Common in grasslands and marshes.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 3079 Nongpoh(Khasi Hills).

Ischaemum timorense Kunth. Rev. Gram. 1: 369. t. 98. 1830; Hook.f. Fl. Brit. India 7: 136. 1896; Bor in Fl. Assam 5: 428. 1940 et Grass. Burm. Ceyl. Ind. Pak. 185. 1960.

Annuals. Culms rooting at base, glabrous or sometimes pubescent at nodes. Leaves lanceolate or ovate-lanceolate, acuminate, glabrous or pubescent, narrowed at the base not auricled, margin scabrid. Sheaths loose, glabrous, hairy near the throat. Ligule membranous, truncate. Inflorescence of 2 terminal, spiciform racemes, 3-7 cm long. Spikelets lanceolate,

2-4 mm long. Sessile spikelets similar to pedicelled ones: lower glumes acuminate, bi-cuspidate, 9-nerved, auriculate at the base; upper glumes glabrous, hyaline, aristate, median nerve prominent. Pedicelled spikelets: pedicels 5 mm long, hirsute. Lower florets empty or male. Upper florets hermaphrodite: lemmas 4 mm long, membranous, hyaline, acute, 1-nerved. Paleas hyaline, 2-nerved. Upper florets hermaphrodite: lemmas hyaline, 2-lobed, awned near the base. Stamens 3. Styles 2, stigmas plumose, caryopsis ovoid.

Common in open areas, specially in marshes.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1643 Jowai (Jaintia Hills).

Jansenella Bor

Jansenella griffithiana (C. Muell.) Bor in Kew Bull. 1955: 98. 1955 et Grass. Burm. Ceyl. Ind. Pak. 426. 1960. - - Danthonia griffithiana C. Muell. in Bot. Z. 14: 347. 1856. - - Arundinella avenacea Munro ex Thw. Enum. Pl. Zeyl. 362. 1864; Hook.f. Fl. Brit. India 7: 69. 1896.

Annuals. Culms rooting at base, 10-30 cm high, geniculate, glabrous. Leaves ovate-acute, amplexicual, margin shortly scabrid. Ligule membranous with stiff hairs. Panicles contracted, 2-6 cm long, subpyramidal. Spikelets 4-5 mm long, glabrous, or with few scattered tubercle based hairs. Lower glume as long as

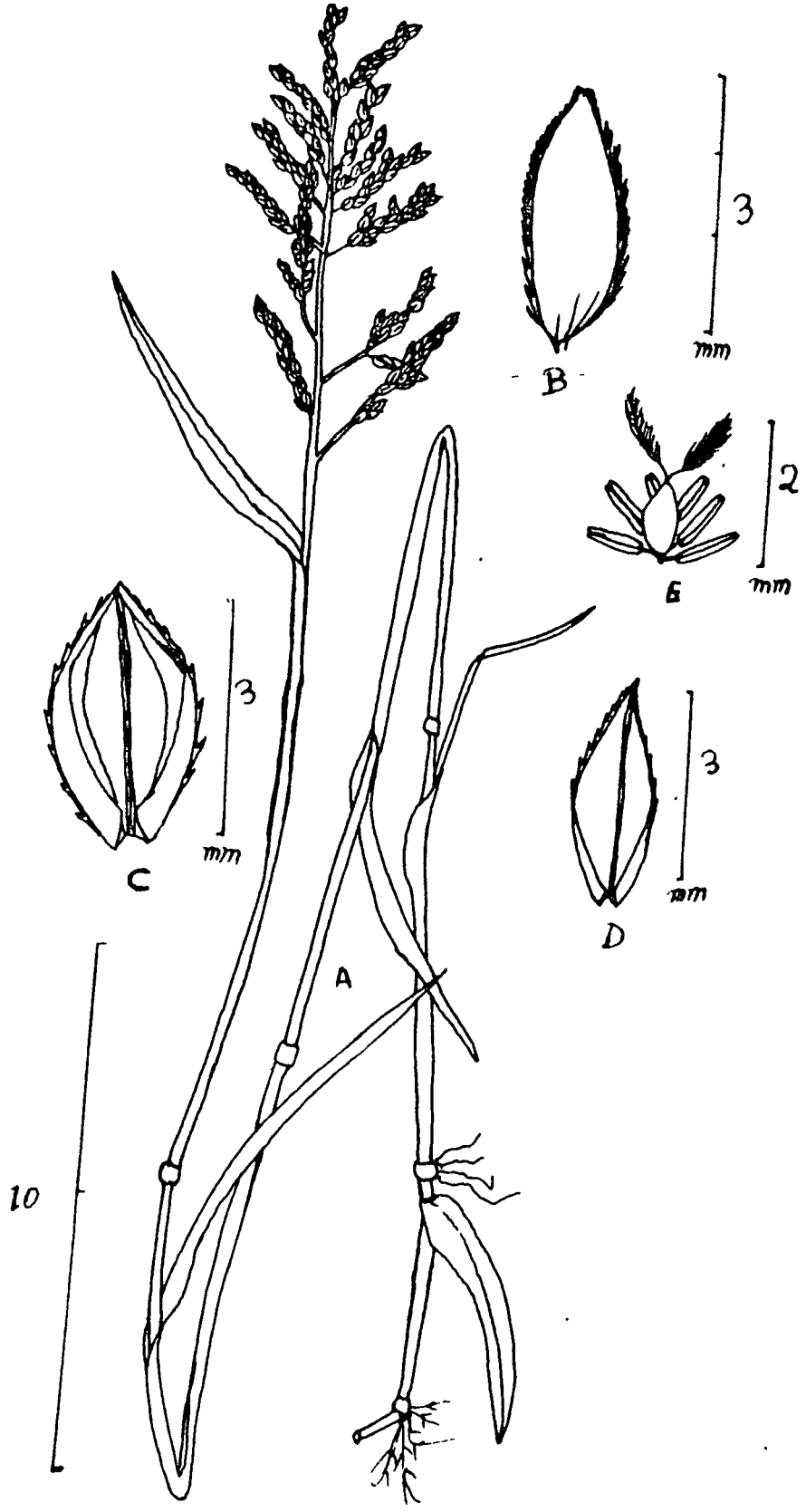


Plate 54 Leersia hexandra S.W.A. Habit, B. Spikelet, C. Lower Glume D. Upper Glume E. Pistil with Stamens.

spikelets with short hispid arista, acuminate, 3-nerved; upper glumes with distinct nerves from the upper half, acuminate, lemma hyaline, linear. Upper florets hermaphrodite, bearded on the callus: lemma 3 mm long, 2-lobed, awned, awn twisted. Stamens 3. Styles 2, stigmas feathery.

Common soil covered rocks, specially in marshes.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1202 Mawmluh (Khasi Hills); 1867 Sutnga (Jaintia Hills).

Leersia Soland.

Leersia hexandraS Sw. Prod. Veg. Ind. Occ. 21. 1788; Hook.f. Fl. Brit. India 7: 94. 1896; Bor in Fl. Assam 5: 173. 1940 et Grass. Burm. Ceyl. Ind. Pak. 599. f. 68. 1960 (Plate 54).

Vern.-' Batpur ' (K).

Perrenial aquatic grasses. Culms slender, prostrate, branched. Leaves linear, acute or obtuse, rolling up when dry, rough, 5-12 x 0.2-0.5 cm; sheaths loose, margin membranous. Ligule membranous, truncate. Panicles terminal, 5 cm long, subpyramidal. Axis striate, glabrous. Spikelets imbricate, compressed, 4 mm long. Pedicels very short. Lower glumes reduced to a scar at the base of the spikelet; upper glumes cymbiform, as long as spikelets. Lemmas similar to upper glumes,

3-5-nerved, with cilia on the outer surface, compressed. Palea smaller than lemma. Lodicules 2, compressed on the caryopsis. Stamens 6. Styles 2, stigmas feathery.

Very common weeds in paddy fields and marshes as well as in the margin of lakes, ponds etc.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1009 Shillong,(Khasi Hills); 1415 Baghmara (Garo Hills).

Leptochloa P. Beauv.

Leptochloa chinensis (Linn.) Nees in Syll. Ratisb. 1: 4. 1824; Hook.f. Fl. Brit. India 7: 299. 1896; Bor in Fl. Assam 5: 112. 1940 et Grass. Burm. Ceyl. Ind. Pak. 516. 1960; Babu Herb. Fl. Dehra Dun 621. 1977. - - Poa chinensis Linn. Sp. Pl. 69. 1753.

Annuals. Culms tall, 50-90 cm high, ascending from a geniculate base, glabrous. Leaves linear, 30-40 x 0.3-0.5 cm, acute, rough, margin scabrid; sheaths loose, glabrous. Ligule tuft of white hairs. Inflorescence a linear, elongated spike, up to 40 cm long; axis striate, glabrous, rhachis scabrid. Spikelets 2-3 mm long, 4-6-flowered, compressed. Lower glumes 1 mm long, cuneate, margin serrate; upper glumes ovate, 1.5 mm long, nerves obscure. Lemma broadly ovate, 1-2 mm long, ciliate on margin. Palea coriaceous. Stamens 3. Styles 2, stigmas plumose.

Frequent in fallows and bunds of paddy fields.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 3003 Burnihat (Khasi Hills).

Lolium Linn.

Annuals or perennials. Leaves flat or convolute. Spikelets 2-ranked, alternate, laterally compressed, sunk in the cavity of the rhachis of a simple spike, many-flowered, hermaphrodite, or sometimes the uppermost reduced. Glumes equal; lower glumes reduced, 7-9-nerved. Lemmas oblong, rounded on the back, obscurely 2-toothed at the apex, awned or awnless. Paleas equalling the lemmas or nearly so, 2-keeled. Lodicules 2, lanceolate with a lateral lobe or tooth. Stamens 3. Ovary glabrous. Stigmas laterally exserted. Caryopsis linear or oblong with a long hilum.

K E Y T O S P E C I E S

1a. Spikes rigid; spikelets not awned, not turgid . . . . . rigidum

1b. Spikes not rigid; spikelets awned, very turgid . . . . . temulentum

Lolium rigidum Gaud. Agrost. Helvet. 1: 334. 1811; Hook.f. Fl. Brit. India 7: 364. 1896; Bor Grass. Burm. Ceyl. Ind. Pak. 546. 1960.

Annuals. Culms solitary or tufted 20-40 cm high, glabrous. Leaves radical, numerous, spreading, leaves on the culm short, 4-6 cm long, convolute; sheaths loose, striate, glabrous. Ligule membranous, truncate. Inflorescence a solitary spike. Spikelets 5-8 mm long, sessile, 3-11-flowered, adpressed to rhachis. Lower glumes woody, 3-5-ribbed, ribs distinct on the ventral surface, margin hyaline, membranous; upper glumes 5 mm long, broadly lanceolate, 5-nerved with granules in between the nerves, apex hyaline rounded. Lemma smaller than the upper glumes, obtuse or rounded, 5-7-nerved. Palea cymbiform as long as the lemma with finely spinous margin, thick and nerveless. Lodicules 2, linear, 1-3-nerved. Stamens 3. Styles 2. Caryopsis oblong, elliptic.

Common in fields.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 3289 Shillong.

Lolium temulentum Linn. Sp. Pl. 85. 1753; Hook.f. Fl. Brit. India 7: 364. 1896; Bor in Fl. Assam 5: 66. 1940 et Grass. Burm. Ceyl. Ind. Pak. 546. 1960; Babu Herb. Fl. Dehra Dun 622. 1977.

Culms decumbent or suberect, 30-60 cm high, 3-5 nodded, glabrous. Leaves thin, 10-20 cm long, striate, convolute. Sheaths glabrous, striate. Ligule short, truncate. Spikes 15-30 cm long. Spikelets 12-20, alternate, nodding, linear, 8-10 mm long, acute. Lower glumes subulate, 6-8 mm long, 3-nerved, nerves prominent on the dorsal surface; upper glumes similar to lower ones,

3-5-nerved. Lemmas broad, as long as the spikelets, faintly 5-nerved, spinous near the margin, apex with 2 cm long awn. Palea 1-1.2 cm long, oblong-lanceolate, margin involute, keels scabrid. Lodicules 2, as long as the caryopsis. Stamens 3. Ovary elongated with tuft of hairs at the tip, stigmas 2, short.

Common in roadsides, drains and in paddy fields.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 1744 Shillong.

Lophatherum Brongn.

Lophatherum gracile Brongn. in Duperr. Voy. Coq. Bot. 50. t. 8. 1831; Hook.f. Fl. Brit. India 7: 331. 1896; Bor in Fl. Assam 5: 60. 1940 et Grass. Burm. Ceyl. Ind. Pak. 460. 1960.

Perennials. Culms slender, geniculate from base, 25-160 cm high. Leaves lanceolate, abruptly contracted at base, 10-30 x 0.5-1.5 cm, finely acuminate, margin scabrid; sheaths loose, shorter than the internodes. Ligule truncate, ciliate. Panicle sparingly branched, 20-60 cm long. Axis angular, glabrous. Spikelets linear, acute, 5-8 mm long. Lower glumes 5 mm long, ovate-lanceolate, obscurely 5-nerved, subobtuse; upper glumes similar to lower ones, 7-nerved. Lower florets male or neuter: lemma ovate, hyaline, 5 mm long, awn 2 mm long. Palea coriaceous, linear. Upper florets hermaphrodite or female: lemma ovate, apex hispid, 5-7-nerved, 4 mm long. Palea coriaceous. Stamens 3.

Styles connate at base, stigmas 2, feathery. Caryopsis spiny.

Common in forests of lower elevations.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1256 Sohkha (Jaintia Hills); Sherma 12310 Umsaw (Khasi Hills)(ASSAM).

Melinis P. Beauv.

Melinis minutiflora P. Beauv. Ess. Agrost. 54. t. 11. f. 4. 1812; Bor Grass. Burm. Ceyl. Ind. Pak. 315. f. 35. 1960.

Perennials. Culms tall up to 1.5 m high, rooting at the basal nodes, densely hairy below the nodes. Leaves linear-lanceolate ending in an acute point, blades 10-25 x 0.8-1.5 cm, covered with tubercle-based hairs; sheaths loose, tomentose, margin scaberulous. Ligule reduced to a ring of soft hairs. Panicles contracted, with many false racemes. Axis scaberulous, rhachis and pedicels scabrid. Spikelets 2-nate, one with short arista in between the lobes, Glumes ovate, oblong, retuse, lower glumes minute, deltoid; upper 5-7-nerved. Lower florets male or empty: lemma oblong-lanceolate, deeply lobed with a long scabrid awn in between the lobes; palea cymbiform, hyaline, obtuse. Stamens 3. Upper florets hermaphrodite: lemma ovate, 2-lobed awnless, obscurely 3-nerved. Palea hyaline, oblong. Stamens 3, anthers yellow, elongated. Styles 2, stigmas feathery. Caryopsis cuneate.

Rare, collected once only from Burnihat, among other tall grasses.

Fls. & Frts. : November to February.

Specimens examined: Myrthong 3102 Burnihat (Khasi Hills).

Melocanna Trin.

Melocanna bambusoides Trin. apud. Spring. Neue Entd. 2: 43. 1821; Gamble in Hook.f. Fl. Brit. India 7: 417. 1896; Bor in Fl. Assam 5: 25. 1940.

Vern.-'Siejwar' (K).

Evergreen bamboos. Stems erect 8-20 m high, internodes 30-50 cm long. Stemsheaths straw-coloured, 10-20 x 20-30 cm, auriculate at base. Leaves from the fascicled branches, 20-30 x 3-4 cm, apex acute, base attennuate into a petiole. Ligule a fringe of barbed hairs. Inflorescence a branched, decompound panicle, arising in fascicled branches. Spikelets 2-3, in the axils of straw-coloured bracts, 1.2 cm long, glumes striate, lanceolate, mucronate; lemmas as long as the spikelets. Palea larger than the lemma, with 2-lateral flaps. Lodicules ovate, acute, 5-nerved. Stamens 6, free. Styles 2. Caryopsis up to 1 cm long.

Common in forest margins and in secondary forests.

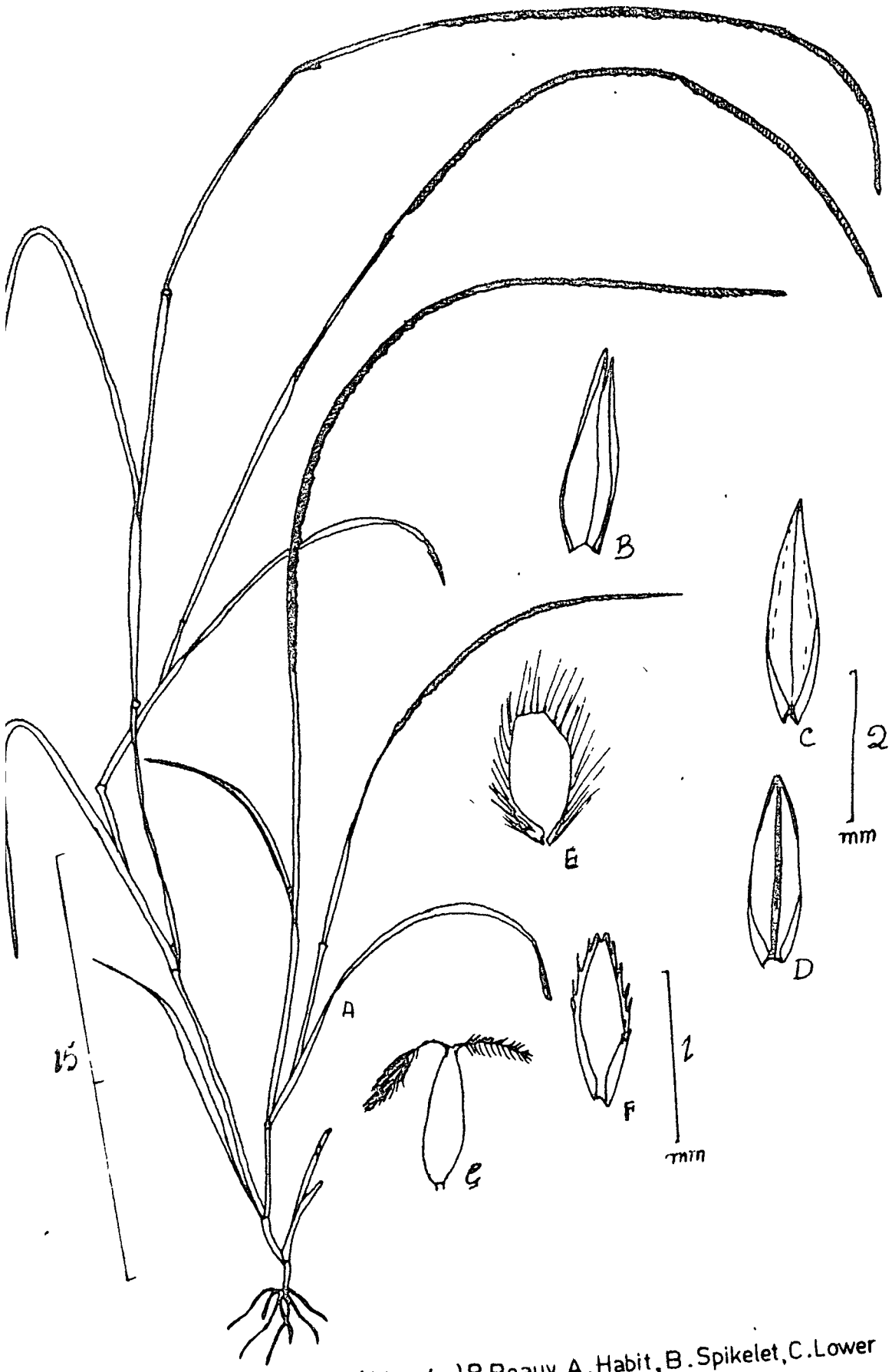


Plate 55 Microchloa indica (Linn.f.) P. Beauv. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Pistil.

Microchloa R. Br.

Microchloa indica (Linn.f.) P. Beauv. Ess. Agrost. 1812; [illegible]. [illegible] Bor in Fl. Assam 5: 126. 1940 et Grass. Burm. Ceyl. Ind. Pak. 473. 1960. - - Nardus indica Linn. f. Suppl. 105. 1781. - - Microchloa setacea R. Br. Prodr. 208. 1810; Hook.f. Fl. Brit. India 7: 283. 1896 (Plate 54).

Annuals. Culms tufted, slender glabrous, 10-25 cm high. Leaves subradical, filiform, tapering to a point, blades 5-12 cm long; sheaths striate shorter than the internodes. Ligule a rim of hairs. Inflorescence a slender filiform curved spike. *Spikelets secund, main axis scabrid or glabrous.* Sessile spikelets brown, compactly adpressed to the axis at an angle of 45° . Lower glumes 3 mm long, ovate, lanceolate, acute, pinkish brown, 1-nerved; upper glumes equal to the lower glumes. Lemma ovate, 1.5 mm long, densely hairy, 2-toothed. Lodicules linear. Stamens 3. Styles 2, stigmas feathery.

Abundant on rocks, as well as in open grassy places.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1044 Shillong.

Microstegium Nees.

Perennials, rarely annuals. Culms simple or branched, often straggling, rooting in the lower nodes, sometimes with distinct aerial roots. Inflorescence a subdigitate or fascicled raceme.

Spikelets 2-nate, one sessile and the other pedicelled. Glumes subequal; lower deeply channelled or concave, truncate or 2-toothed, margin usually inflexed from base upwards. Lower florets male or neuter or reduced to an empty lemma; lower lemma sometimes absent and the palea as long as the lower glume. Upper florets hermaphrodite: lemmas short, entire or 2-fid or reduced to a dilated base of awn. Paleas absent or if present very minute. Lodicules 2, obliquely truncate. Stamens 3, sometimes 2. Caryopsis firm.

K E Y T O S P E C I E S

1a. Upper lemma well developed, split to the middle into long, glabrous triangular lobes . . . . . petiolare

1b. Upper lemma small, shortly 2-lobed or entire.

2a. Anthers very minute, less than ½ mm long . . . . . vimineum

2b. Anthers more than 1 mm long.

3a. Racemes 4-10 cm long, not digitate, spaced at right angle to the rhachis; anthers 2. . . . . nudum

3b. Racemes not spreading at right angles; anthers 3.

4a. Joints of raceme and pedicels clavate above, hollow . . . . . eucnemis

4b. Joints and pedicels otherwise.

5a. Anthers 2-2.5 mm long; spikelets 3-4 mm long, purplish, nodes glabrous or hairy; lower glume oblong or obovate . . vagans

5b. Anthers less than 2 mm long; spikelets pale; nodes glabrous; lower glume lanceolate or oblong-lanceolate . . . . ciliatum

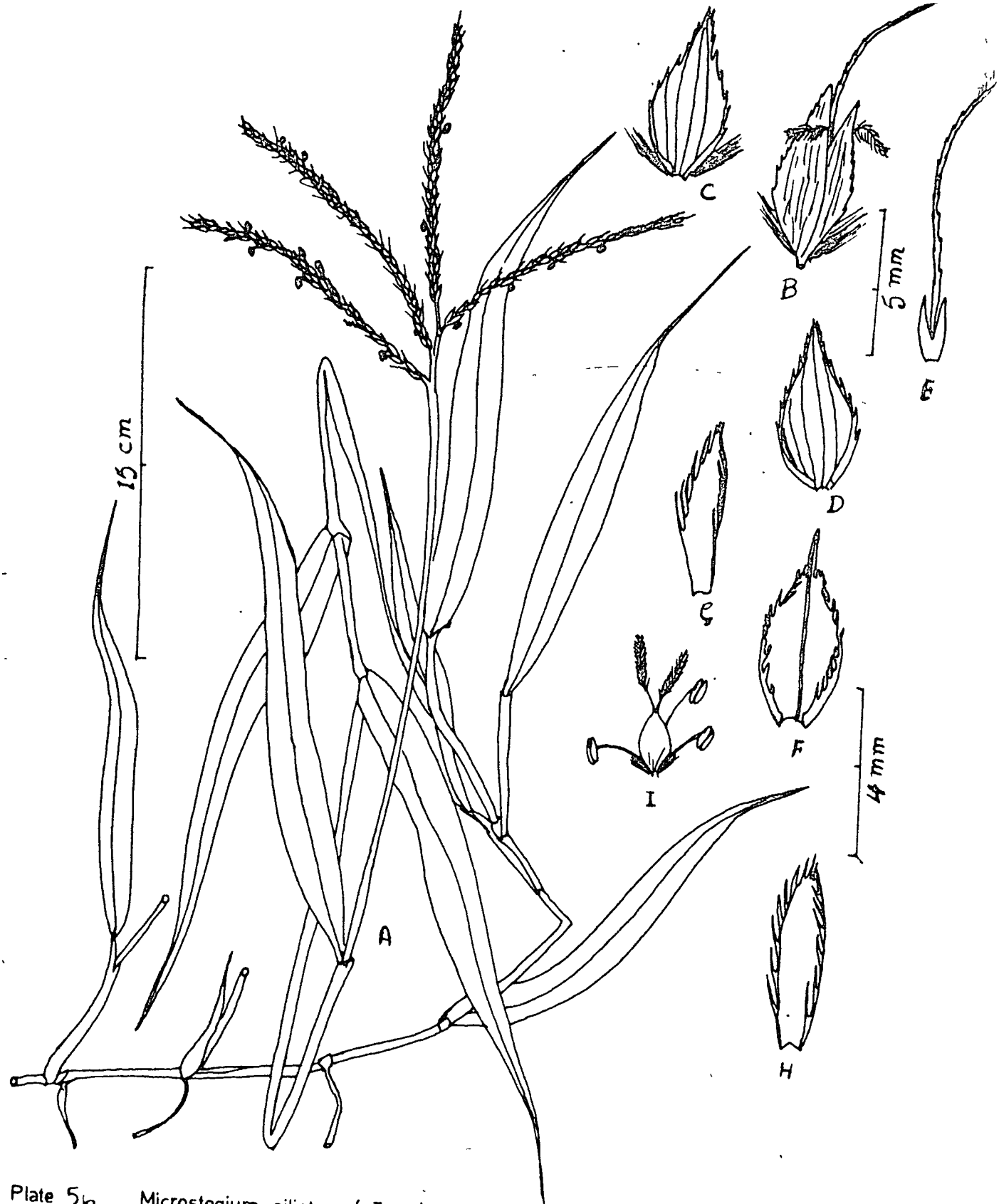


Plate 56 Microstegium ciliatum (Trin.) A. Camus A. A portion of the plant, B. Spikelet, C. Lower Glume D. Upper Glume E. Lemma, F. & G. Paleas H. Lodicule, I. Gynoecium with Androecium.

Microstegium ciliatum (Trin.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 201. 1921; Bor in Fl. Assam 5: 330. 1940 et Grass. Burm. Ceyl. Ind. Pak. 193. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 367. 1966; Babu Herb. Fl. Dehra Dun 623. 1977. - - Pollinia ciliata Trin. in Mem. Acad. Sci. Petersb. 2(6): 306. 1832; Hook.f. Fl. Brit. India 7: 116. 1896 (Plate 56).

Vern.- ' U Pruit ' (K).

Perennials. Culms tufted, straggling, highly branched from the decumbent base. Leaves linear-lanceolate, 5-12 x 0.5-1.5 cm, sessile or shortly petioled, apex acute, hairy on the dorsal side; sheaths clasping, striate, glabrous. Ligule membranous, truncate 1 mm long. Inflorescence a panicle of 4-8 false racemes, digitate or subdigitate, racemes 5-8 cm long, fragile, rhachis jointed, each internode ending in sessile spikelets. Pedicels 4 mm long, acute; lower glumes cymbiform, lanceolate, dentate on margin, 2-4-nerved; upper glumes ovate, lanceolate, 3 mm long, distinctly 3-nerved, acute, ciliate at the back. Lower florets neuters. Upper florets hermaphrodite: lemma small, awned; palea hyaline. Stamens 3, anthers elongated. Styles 2, stigmas plumose.

Abundant in forests under the shrubs, in association with ferns and other herbaceous plants.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1164 Shillong (Khasi Hills); 1281 Sohkha (Jaintia Hills).

Microstegium eucnemis (Nees ex Steud.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 200. 1921; Bor Grass. Burm. Ceyl. Ind. Pak. 194. 1960. - - Pollinia eucnemis Nees ex Steud. Syn. Pl. Glum. 1: 409. 1855. - - Coelarthron brandisii Hook.f. Fl. Brit. India 7: 164. 1896.

Annuals. Culms tufted, branched, glabrous, 1 m high. Leaves 6-10 x 0.5-1 cm, linear-lanceolate, glabrous, acute. Ligules very short. Inflorescence a panicle of false racemes, 10 cm long. Spikelets 6 mm long, acute. Lower glumes linear, 7 mm long, obscurely nerved, margin ciliate, apex shortly 2-lobed; upper glumes ovate-lanceolate, acute, as long as lower ones. Lemmas reduced to a long awn, flattened at base, awn more than 1 cm long; palea short, hyaline. Stamens 3, anthers unequal. Styles 2, stigmas feathery.

Gows mostly in open areas; in forest edges and near drains.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 3077 Nongpoh (Khasi Hills),

Microstegium nudum (Trin.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 201. 1921; Bor in Fl. Assam 5: 332. 1940 et Grass. Burm. Ceyl. Ind. Pak. 194. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 367. 1966; Babu Herb. Fl. Dehra Dun 623. 1977. Pollinia nuda Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2: 307. 1832; Hook.f. Fl. Brit. India 7: 117. 1896.

Vern. -! U Pruit ' (K).

Annuals. Culms prostrate or decumbent, 0.5-1 m high, rooting at base. Leaves small, 2-5 x 0.2-0.8 cm, glabrous or sparsely hairy, margin scabrid, tapering abruptly at base, apex acute, sheaths loose, striate. Ligule a short truncate membrane. Inflorescence of 4-6 digitate or subdigitate racemes, flexuous, weak, whitish, 3-8 cm long, jointed. Spikelets 4-5 mm long, callus bearded. Pedicels scaberulous, inflated above. Lower glumes scabrid, 7-nerved, 2-toothed; upper glumes ciliate, 3-nerved. Lemmas hyaline, linear, 3-nerved, awn 1.5-2 cm long, capillary, scabrid. Palea awnless. Stamens 2, anthers short. Stigmas feathery. Ovary linear.

Common on old walls and along road cuttings.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1239, 1194 Shillong.

Microstegium petiolare (Trin.) Bor in Ind. For. Rec. Bot. 1, 3: 87. 1938, in Fl. Assam 5: 328. 1940 et Grass. Burm. Ceyl. Ind. Pak. 194. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 367. 1966. - - Spodiopogon petiolaris Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2: 301. 1832.

Perennials. Culms straggling or rooting at the lower nodes, 2 m high. Leaves linear, tapering to a fine point, blades 15-30 x 1-2 cm, hairy, margin scabrid; sheaths striate, glabrous. Ligules membranous, 7-10 mm long. Racemes 10-20, 10-12 cm long. Pedicels scabrid. Spikelets 4-5 mm long, adpressed to the joint, acute.

Lower glumes broadly ovate, as long as spikelets, 5-7-nerved, subacute, scabrid on the keels; upper glumes ovate-lanceolate, as long as the lower glumes, 4-nerved, aucte. Lemma well developed, apex with 2-triangular lobes, geniculately awned in between, nerveless. Palea oblong, hyaline, 1-nerved with few cilia on margin. Lodicules 2, small, linear. Stamens 3, anthers 3 mm long, yellow. Styles 2, stigmas feathery.

Common in forests scrambling on ferns and other small shrubby species.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 3060 Shillong Peak (Khasi Hills); Deka 20076 Jowai (Jaintia Hills).

Microstegium vagans (Nees ex Steud.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 200. 1921; Bor Grass. Burm. Ceyl. Ind. Pak. 195. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 368. 1966. - - Pollinia vagans Nees ex Steud. Syn. Pl. Glum. 1: 410. 1855; Hook.f. Fl. Brit. India 7: 115. 1896. - - Microstegium gratum (Hack.) A. Camus in Ann. Soc. Linn. Lyon. 201. 1921; Bor in Fl. Assam 5: 330. 1940.

Vern.-' U Langpruit ' (K).

Perennials. Culms slender up to 2 m high, rooting at the lower nodes, highly branched. Leaves linear, 10-20 x 0.5-1.2 cm, acute, sparsely hairy, margin scabrid, sheaths loose, as long as the internodes, with tubercle based hairs. Ligule membranous,

1-2 mm long, brown, truncate. Inflorescence a panicle of 6-10 racemes, 10-12 cm long, axis subtrigonous, hairy. Pedicels as long as spikelets, spikelets 3-4 mm long, purplish, ovate-lanceolate. Lower glumes obtuse, 4-nerved, intercarinal nerves interrupted near the summit, rigidly hairy; upper glumes 3.5-4 mm long, obtuse or mucronate, papyraceous, 3-4-nerved, glabrous. Lower florets male or neuter; upper florets hermaphrodite: lemma short, less than $\frac{1}{2}$ mm long, awned, geniculate, 1.5 cm long. Stamens 3. Stigmas 2, feathery.

Common in shady areas, both in lower and higher elevations, specially along the banks of streams, rivers, etc. in association with ferns and other shrubby species.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1323 Shillong.

Microstegium vimineum (Trin.) A. Camus in Ann. Soc. Linn. Lyon. n.s. 68: 201. 1921; Bor in Fl. Assam 5: 331. 1940 et Grass. Burm. Ceyl. Ind. Pak. 195. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 368. 1966. - - Andropogon vimineus Trin. in Mem. Acad. Sci. Petersb. 2(6): 268. 1832.

Annuals. Culms tufted or gregarious, decumbent and suberect from prostrate bases, rooting at the lower nodes, glabrous. Leaves linear, lanceolate, 3-10 cm long, acute, sheaths loose, shorter than the internodes. Ligules membranous, 2-3 mm long, truncate. Inflorescence a panicle of 2-6 false racemes,

subdigitate, 4-6 cm long, rhachis jointed, swollen at the nodes. Sessile spikelets 4-6 mm long: lower glumes as long as the spikelets or slightly shorter, channelled, 2-toothed, keels ciliate, upper glumes acute or subaristate, 3-nerved, margin ciliolate. Upper florets hermaphrodite: lemmas short, 1-2 mm long, 2-lobed, with 1-1.6 cm long awn in between the lobes, glabrous. Palea short, ovate, subobtuse. Stamens 3. Stigmas 2, exserted near the tip of the spikelets, plumose.

Common on wet soils, drains, along streams, rivulets, etc.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1448 Tura (Garo Hills); Deka 13865 Dympep (Khasi Hills) (ASSAM).

Miscanthus Anders.

Miscanthus nepalensis (Trin.) Hack. in DC. Monogr. Phan. 6: 104. 1889; Hook.f. Fl. Brit. India 7: 107. 1896; Bor in Fl. Assam 5: 311. 1940 et Grass. Burm. Ceyl. Ind. Pak. 196. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 368. 1966. - - Eulalia nepalensis Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2: 333. 1832.

Annuals. Culms 1-2 m high, simple, glabrous, except below the panicle, roots fleshy. Leaves linear, finely acuminate, blades 25-60 x 0.5-1 cm, margin scabrerulous, sheaths striate, glabrous, hairy below the collar. Ligule membranous, truncate. Inflorescence flabiliform, main axis shorter than the branches, hairy at nodes, racemes filiform or capillary, jointed, 10-15 cm

long, spikelets with long hairs at base, pedicels equalling the spikelets, expanding at the apex, scabrid. Lower glumes cuneate, 1-2 mm long, 2-toothed, awn long, scabrid, Stamens 3. Stigmas 2, feathery.

Common along old road cuttings on hills, in moist, ~~semi~~ shaded areas.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1172 Shillong.

Muhlenbergia Schreb.

Muhlenbergia huegelii Trin. in Mem. Acad. Petersb. ser. 6, 6(2): 292. 1841; Bor in Fl. Assam 5: 148. 1940 et Grass. Burm. Ceyl. Ind. Pak. 401. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 368. 1966.

Annuals. Culms weak, straggling. Leaves linear, 8-30 x 0.2-0.5 cm, scabrid on the keels, margin scabrid, apex obtuse; sheaths striate, loose. Ligule membranous lacerate, hyaline, 2-4 mm long. Inflorescence an elongated contracted or branched panicles. Branches and branchlets capillary. Spikelets borne on scabrid pedicels, 1-flowered. Lower glumes lanceolate, 1-2 mm long, scabrid on the keels, strongly 1-nerved, apex acute; upper glumes ovate-lanceolate, acute, 1-nerved, scabrid on the keels. Lemmas hyaline as long as the glumes, 3-nerved, median nerve produced to a flexuous awn. Stamens 3. Styles 2, stigmas feathery.

Occasional in shrubby areas, scrambling over other plants.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 1186 Shillong (Khasi Hills); 1517 Tura (Garo Hills); 1576 Sutnga (Jaintia Hills).

Narenga Bor

Narenga porphyrocoma (Hance) Bor in Ind. For. 66: 267. 1940, in Fl. Assam 5: 316. 1940 et Grass. Burm. Ceyl. Ind. Pak. 198. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 369. 1966; Babu Herb. Fl. Dehra Dun 624. 1977. - - Saccharum narenga Hance in Wall. Cat. n. 8856 nomen; Hook.f. Fl. Brit. India 7: 120. 1896. - - Eriochrusis narenga Nees ex Steud. Syn. Pl. Glum 1: 441. 1855. - - E. porphyrocoma Hance ex Trin. in Journ. Bot. 14: 294. 1876. - - Saccharum porphyrocoma (Hance) Hack. in DC. Monogr. Phan. 6: 120. 1889 (Plate 57).

Annuals. Culms solitary, 1-3 m high, glabrous, hairy at the nodes. Leaves linear, up to 1 m x 8-12 mm, hairy on the dorsal surface, midrib prominent, margin scabrid; sheaths loose, striate, glabrous, densly hairy at the joint between blade and sheath. Ligule membranous, truncate, 3 mm long. Inflorescence a contracted panicle, covered with golden brown hairs. Branches erect, very fragile. Spikelets dense. Sessile spikelets 2-3 mm long, callus with tufts of cilia, as long as or longer than spikelets. Pedicelled spikelets similar to sessile. Lower florets empty, reduced into a lemma. Upper florets hermaphrodite: lower

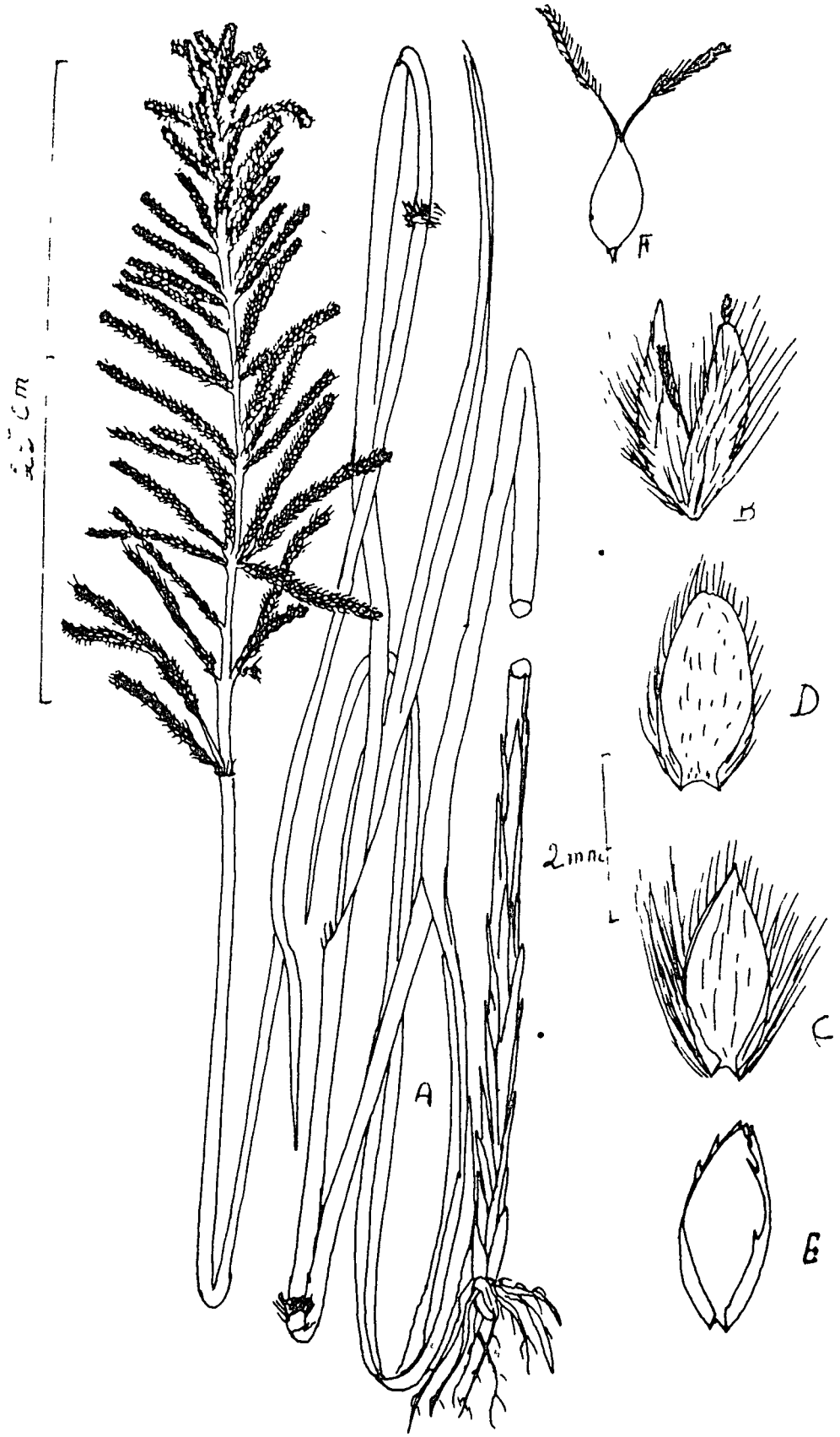


Plate 57 Narenga porphyrocoma (Hance) Bor A.Portions of stem B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lemma, F.Pistil.

glumes coriaceous, golden brown, or yellow with hairs at the back and on the margin, nerveless; upper glumes truncate, ciliate on margin and on back. Lemma hyaline expanded, keels ciliate. Lodicules 2. Stamens 3. Styles 2, stigmas plumose.

Occasional.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1334 Barapani (Khasi Hills). Deka 20087 Nartiang (Jaintia Hills). (ASSAM).

Neyraudia Hook.f.

Neyraudia reynaudiana (Kunth) Keng ex Hitchc. in Amer. Journ. Bot. 21: 131. 1934; Bor in Fl. Assam 5: 115. 1940 et Grass. Burm. Ceyl. Ind. Pak. 518. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 369. 1966; Babu Herb. Fl. Dehra Dun 625. 1977. Arundo reynaudia Kunth Rev. Gram. 1: 275. t. 49. 1830. - - Phragmites zollingeri Steud. in Zoll. Verz. 55. 1854. - - Neyraudia madagascariensis var. zollingeri Hook.f. Fl. Brit. India 7: 305. 1896.

Perennials, Culms tall, up to 4 m high, glabrous, glaucous. Rootstock stout. Leaves tufted, 30-60 x 1-2 cm, margin scabrid, and thick, dorsal surface glaucous; sheaths overlapping at base, glabrous, pale or straw-coloured, margin membranous. Ligule a ring of hairs. Inflorescence a large panicle, silvery grey, mixed with white, rhachis scabrid, striate, branchlets filiform.

Spikelets 6-8 mm long, 4-6-flowered. Lowest floret empty, glumes linear, acute, 2-3 mm long with 1-median nerve. Upper florets male or hermaphrodite, lemma cuneate, 4 mm long, 3-nerved, marginal nerves with penicillate hairs. Palea 2 mm long, 2-toothed, keels scabrid. Stamens 3, anthers flat. Styles stipitate.

Common in all types of soils, both in forests and in open grassy areas.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1301 Pongtung (Khasi Hills); Deka 5095 Jowai (Jaintia Hills); De 20130 Rongrengiri, Panigrahi 22490 Tura (Garo Hills).(ASSAM).

Ophiuros Gaertn.f.

Ophiuros megaphyllus Stapf ex Haines Bot. Bihar & Orissa 1058. 1924; Bor in Fl. Assam 5: 449. 1940 et Grass. Burm. Ceyl. Ind. Pak. 199. 1960.

Tall annuals. Culms 1-4 m high, glabrous, branched. Leaves linear, ensiform, cordate at base, tapering to a fine point, blades 25-80 x 0.8-2 cm, hairy, margin spinous, sheaths shorter than the internodes, pubescent. Ligule a truncate membrane, with tufts of hairs above. Racemes emerging from spathe-like bracts, fragile, pedicelled spikelets suppressed. Sessile spikelets sunk at the joint of rhachis. Spikelets distant, alternate, 2-3 mm long. Lower glumes coriaceous, obscurely 7-nerved, upper

glumes hyaline, 3-nerved. Lemma ovate-lanceolate, margin infolded. Palea linear, hyaline. Stamens 3. Styles 2, brownish.

Common in grasslands and also under bushes both in high and low elevations.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1344 Shillong (Khasi Hills); 1478 Garumpani (Jaintia Hills).

Oplismenus P. Beauv.

Perennials or sometimes annuals. Culms slender, decumbent or prostrate, many nodded, internodes with an adaxial decurrent line or villous hairs. Leaves lanceolate, thin. Spikelets awned, 2-nate or solitary, or in clusters, secund, on the angular rhachis of densely or more rarely interruptedly spiciform racemes. Lower florets male or suppressed; upper florets hermaphrodite. Glumes subsimilar, 3-7-nerved, awned. Lower lemma longer than the basal glume, awned; upper lemma awnless. Paleas equalling the lemma. Lodicules 2, cuneate. Stamens 3. Stigmas exserted. Caryopsis oblong.

K E Y T O S P E C I E S

1a. Spikelets fascicled, alternate along the axis
undulatifolius

1b. Spikelets in racemes, alternate along the long, or short axis.

2a. Plants suberect, 40-60 cm long; leaves subglabrous, or sparsely hairy; spikelets with reddish, viscid,

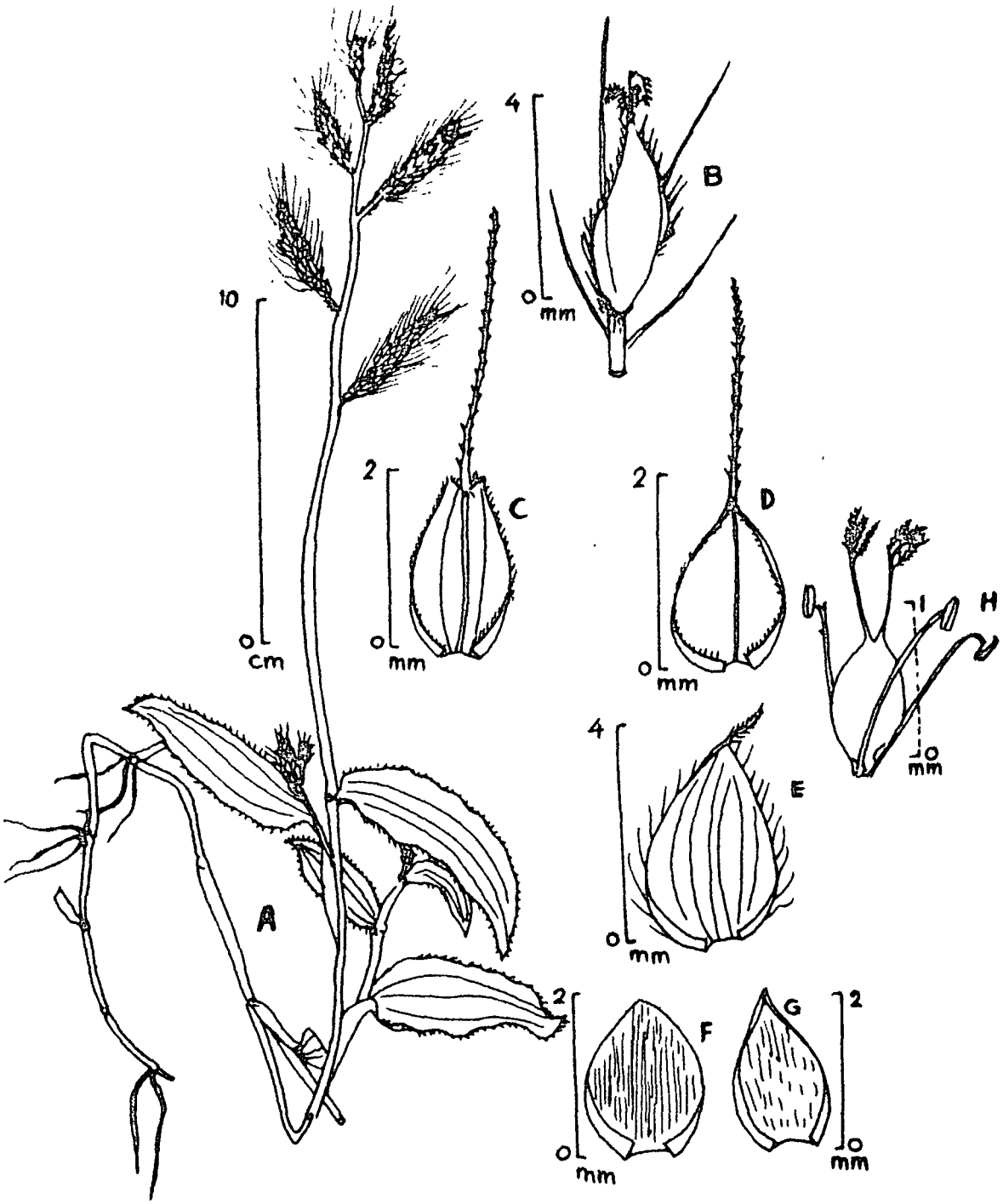


Plate 58 Oplimenus burmannii (Retz.) Beauv. A. Habit, B. Spikelet, C. Lower glume, D. Upper glume, E. Lemma, F. Palea, G. Lodicule, H. Young ovary with style & stamens.

filiform stiff awns . . . . compositus

2b. Plants very dwarf, prostrate or decumbent, less than 40 cm long; leaves densely hairy; spikelets with pale, barbellate, capillary, flexuous awns . . . . . burmannii

Oplismenus burmannii P. Beauv. Ess. Agrost. 54: 168-169. 1812; Hook.f. Fl. Brit. India 7: 68. 1896; Bor in Fl. Assam 5: 263. 1940 et Grass. Burm. Ceyl. Ind. Pak. 317. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 369. 1966; Babu Herb. Fl. Dehra Dun 626. 1977 (Plate 58).

Annuals. Culms decumbent, rooting at lower nodes, glabrous, or hairy in the longitudinal furrows, 10-15 cm high. Leaves ovate-lanceolate, hairy on both surfaces, apex subacute, blades 1-5 x 0.5-1.5 cm, slightly scabrid on margin; sheaths loose, glabrous. Ligule truncate, hairy. Inflorescence a panicle of short spikes. Spikelets more or less secund, distant, axis angular, hairy. Racemes short, 0.5-2 cm long. Spikelets ovate-lanceolate, acute, 3 mm long, seated on ciliate pedicels. Lower glumes 1.5 mm long, ovate, 3-nerved, ciliate, depressed, awns filiform up to 1 cm long, white, slightly rough; upper glumes similar to lower ones, but larger, awns shorter. Lower florets barren: lemma ovate, coriaceous, mucronate, prolonging into a short awn. Upper florets hermaphrodite: lemmas broadly ovate, apex slightly rounded, awn 5 mm long. Palea hyaline, 3-nerved, acute. Stamens 3, anthers yellow. Styles 2.

Abundant in forests and shady places.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1350 Shillong.

Oplismenus compositus P. Beauv. Ess. Agrost. 54: 168-169. 1812; Hook.f. Fl. Brit. India 7: 66. 1896; Bor in Fl. Assam 5: 262. 1940 et Grass. Burm. Ceyl. Ind. Pak. 317. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 369. 1966; Babu Herb. Fl. Dehra Dun 626. 1977.

Perennials. Culms erect or decumbent, rooting at base, 50-100 cm high, glabrous, or slightly hairy in the furrows. Leaves ovate-lanceolate, 1-15 x 1-4 cm, tapering to the acute point, base rounded, hairy on both suraces, margin scaberulous. Ligule a rim of cilia. Inflorescence a panicle of spikes 5-20 cm long, racemes generally alternate on the hairy, angular axis, 5 cm long, Spikelets 2-nate or solitary, 3 mm long, truncate, ciliate, awn up to 1.5 cm long, purple or red. Lower glumes of sessile spikelets 2 mm long; upper glumes slightly larger than the lower ones, 7-9-nerved, ciliate from the back, mucronate, awn short up to 4 mm long. Lower florets empty or male: lemma broadly ovate, 9-nerved, ciliate, shortly awned. Upper florets hermaphrodite: lemma hyaline, coriaceous nerveless, subacute. Palea similar to the lemma. Stamens 3, anthers reddish-pink. Styles 2, stigmas feathery. Caryopsis polished, linear-lanceolate, acute.

Abundant in shady places and even in forests.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1126, 1029 Shillong (Khasi Hills); 1272 Garumpani (Jaintia Hills); 1436 Baghmara (Garo Hills).

Oplismenus undulatifolius (Ard.) P. Beauv. Ess. Agrost. 54. 1812; Hook.f. Fl. Brit. India 7: 66. 1896; Bor in Fl. Assam 5: 264. 1940 et Grass. Burm. Ceyl. Ind. Pak. 318. 1960. Panicum undulatifolium Ard. Animad. Spec. Alt. 14. t. 4. 1764.

Perennials. Culms erect or decumbent from geniculate base, rooting at base, simple or branched, 0.5-1.2 m high. Leaves lanceolate, ovate, tapering abruptly towards the apex and base, margin undulate, 8-15 x 2-2.5 cm; sheaths loose, striate, ciliate near the mouth, shorter than the internodes. Ligule a small ciliate membrane, erose. Inflorescence a simple panicle, axis angular, terminal fascicle reduced. Spikelets sessile, 3-4 mm long, acute. Lower glumes 2.5 mm long, 5-nerved, margin scabrid, awned below the tip at the back, awn up to 1,5 cm long; upper glumes 3 mm long, ovate, 5-nerved, margin scabrid, awns short 3-4 mm long. Lemmas 4 mm long, hyaline, 9-nerved, shortly awned, margin membranous; upper lemma awnless, nerves obscure, obtuse. Palea linear, nerveless, subobtuse. Stamens 3. Stigmas 2, feathery.

Common in forests.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1108 Shillong.

Oryza Linn.

Tall, marshy or aquatic grasses with long, linear, rough leaves. Inflorescence a terminal panicle. Spikelets hermaphrodite, 3-flowered, one only fertile and hence apparently 1-flowered. Glumes represented by minute scales at the apex of pedicel. Lower lemmas 2, subulate, empty; fertile lemmas laterally compressed, coriaceous, 3-5-nerved. Paleas as long as lemmas, 3-nerved. Lodicules 2. Stamens 6. Caryopsis oblong, tightly enclosed by lemmas and paleas.

K E Y T O S P E C I E S

1a. Ligule of lower leaves 2-5 cm long.
  2a. Spikelets persistent, awnless. . *sativa*
  2b. Spikelets deciduous, awned . . *sativa* var. *fatua*
1b. Ligule of lower leaves less than 6 mm long.
  3a. Spikelets glabrous, awnless, surface of fertile lemmas and paleas irregularly granulated; panicle narrow; spikelets 5-5 mm long . . . . . *granulata*
  3b. Spikelets hispid or ciliate on the keels; surface of lemmas and paleas otherwise; panicles loose with spreading racemes; spikelets less than 5 mm long . . . . . *minuta*

Oryza granulata Nees et Arn ex Steud. Syn. Pl. Glum. 1: 3. 1854; nomen Hook.f. Fl. Brit. India 7: 93. 1896; Bor Grass. Burm. Ceyl. Ind. Pak. 604. 1960.

Vern.-'Kba khlaw' (K).

Annuals. Culms erect, tufted, 30-80 cm high, glabrous. Leaves linear-lanceolate, acute, margin scabrid, blades 10-30 x 0.8-1.2 cm; sheaths membranous, truncate, embracing the internodes, glabrous, shorter than the internodes, with stellate hairs. Panicles contracted, 5-15 cm long, branches very short, 2-5 cm long, main axis angular, scabrid. Spikelets ovate-oblong, or ovate-lanceolate, 5-6 x 2-3 mm. Glumes reduced to bristles. Lemmas as long as spikelets, cymbiform, subobtuse, convergently 3-5-nerved. Palea similar to lemmas. Stamens 6, anthers short, linear. Styles 2 with brown feathery stigmas.

Frequent in dry exposed localities on hill tops or on slopes in lower elevations.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1689 Burnihat (Khasi Hills).

Oryza minuta J.S. Presl. ex C.B. Presl. Rel. Haenk. 1: 208. 1830; Bor Grass. Burm. Ceyl. Ind. Pak. 605. 1960. - - O. officinalis Wall. Cat. n. 8635. 1848 nomem; Bor in Fl. Assam 5: 171. 1940. - - O. latifolia Hook.f. Fl. Brit. India 7: 92. 1896 nor. Desv. 1813.

Vern.-'Kba longmer' (K).

Annuals. Culms erect, tufted, 1-3 m high, branched from base, glabrous. Leaves linear, lanceolate, midrib prominent, blades 15-40 x 1-2 cm, rough, margin scabrid, acute, sheaths loose, glabrous. Ligule a truncate membrane, 3-5 mm long.

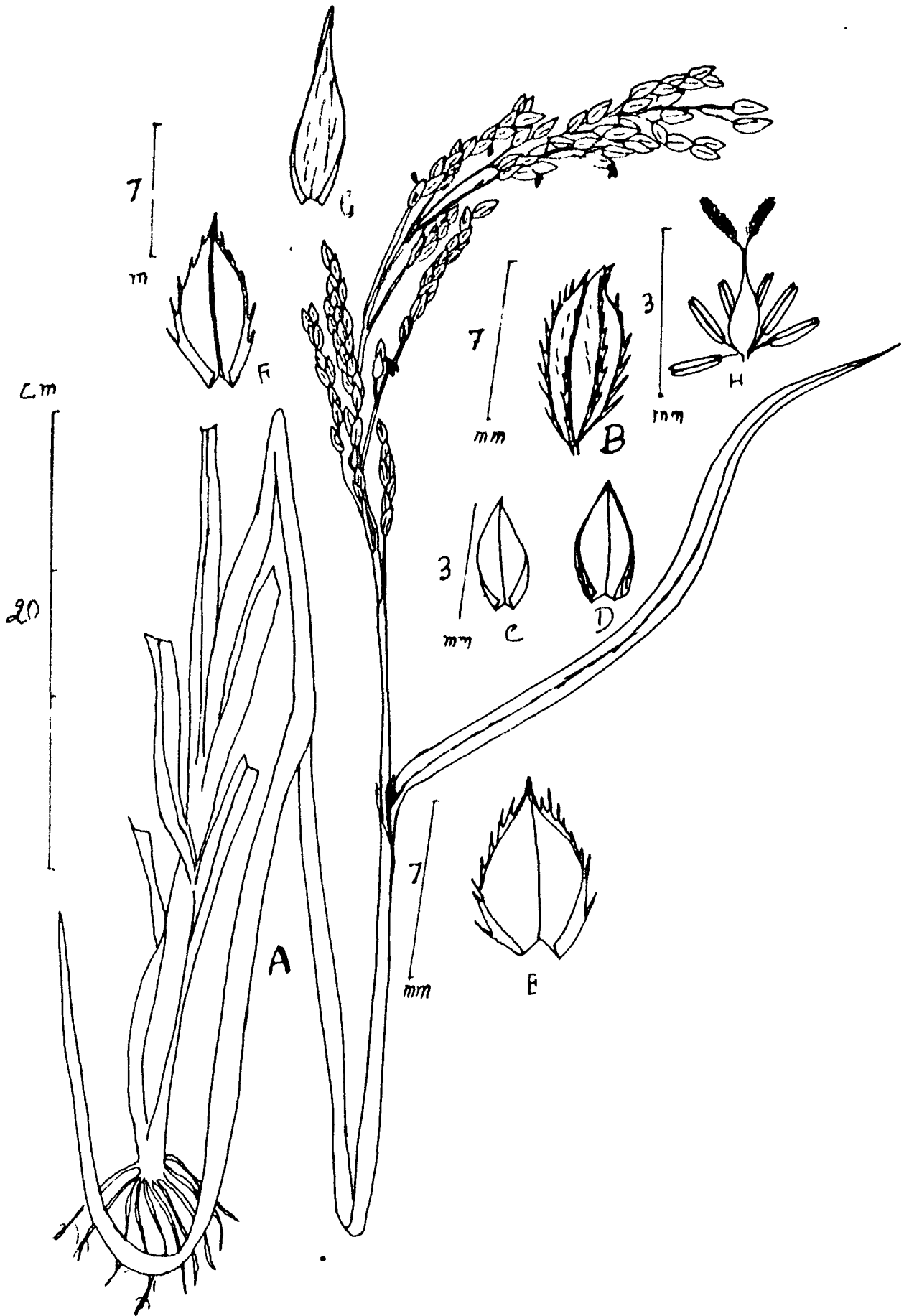


Plate 59 Oryza sativa Linn. A, Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lower Lemma, F. Upper Lemma, G. Palea, H. Pistil & Androecium.

Panicles 10-30 cm long, spreading. Rhachilla scabrid, pedicels 1-2 mm long, angular, scabrid on angles, swollen at top. Spikelets ovate-lanceolate, 3-4 mm long, acute. Glumes reduced to bract-like structures, 1-2 mm long. Lemmas broad, compressed, acute, 3-5-nerved. Palea similar to lemmas but smaller.

Frequent in marshes in lower altitudes, a weed of cultivation.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1486 Nongpoh (Khasi Hills).

Oryza sativa Linn. Sp. Pl. 333. 1753; Hook.f. Fl. Brit. India 7: 92. 1896; Bor in Fl. Assam 5: 170. 1940 et Grass. Burm. Ceyl. Ind. Pak. 605. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 370. 1966; Babu Herb. Fl. Dehra Dun 627. 1977 (Plate 59).

Vern.- 'Kba' (K). 'Mi' (G). 'Kba' (J).

Annuals. Culms erect, branched from base, compressed, striate, Leaves linear, margin scabrid, 20-60 x 0.5-1 cm, rough; sheaths striate, loose, base auricled, ciliate; ligule ciliate, erose. Panicles erect, 10-30 cm long, bending at maturity. Axis angular, scabrid. Pedicels short, swollen at the top. Spikelets ovoid, lanceolate, 6-10 mm long, awned or not. Lower glumes reduced, 1-1.5 mm long, nerveless, acute; upper glumes similar to lower glumes. Lemmas as long as spikelets, ovate-lanceolate, nerveless, acute or acuminate, scabrid from the dorsal keel, embracing the grain. Paleas linear similar to lemmas, but smaller.

Stamens 6, anthers linear. Styles 2, stigmas feathery. Caryopsis oval or oblong.

Cultivated in the fields for their grains. Forms staple food grain of the people in Meghalaya.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1556 Umling (Khasi Hills).

Oryza sativa var. fatua Prain in Beng. Pl. 2: 891. 1903; Bor in Fl. Assam 5: 171. 1940.

Vern.-'Kba-shiah' (K).

Very similar to O. sativa Linn. but the lemmas with much longer awns, as long as 10 cm. This variety is avoided by many farmers as the spikelets are much deciduous and frequently sterile.

Common in paddy fields along with O. sativa, also in marshes and drains.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 3011 Burnihat (Khasi Hills).

Ottochloa Dandy

Ottochloa nodosa (Kunth) Dandy in Journ. Bot. 69: 54. 1931; Bor in Fl. Assam 5: 249. 1940 et Grass. Burm. Ceyl. Ind. Pak. 318. 1960. - - Panicum nodosum Kunth Enum. Pl. 1: 97. 1883;

Hook.f. Fl. Brit. India 7: 43. 1896.

Annuals. Culms straggling, ascending from the geniculate base, rooting at the lower nodes, glabrous. Leaves lanceolate, tapering to an acute apex, hairy, margin scabrid, base subamplexicual. Ligules truncate, very short. Inflorescence a panicle, 10-25 cm long. Rhachis angular, scabrid, Spikelets narrowly elliptic or oblong, acute, 3-4 mm long. Lower glumes ovate-lanceolate, 3-nerved, acute with ciliate margin; upper glumes ovate-lanceolate, 2-3-nerved, sparsely hairy on the dorsal surface. Lower florets male or neuter: lemmas elliptic, oblong 4 mm long, subacute, 5-nerved, hairy on the back; palea broad as long as lemma, obtuse, nerveless. Lodicules shield-like, obtuse. Stamens 3. Styles 2.

Common in secondary forests and forest clearings, in lower elevations.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1690, B1735 Burnihat (Khasi Hills); 1737 Dawki (Jaintia Hills).

Panicum Linn.

Annuals or perennials. Leaves variable, linear to ovate, or lanceolate. Inflorescence a compound or decompound panicle. Spikelets lanceolate, elliptic or oblong. Lower florets male or sterile with or without palea. Glumes unequal, lower ones shorter

than the upper glumes, 5-9-(rarely 3 or 11-) nerved. Paleas thinly membranous as long as the lemmas. Lodicules 2, cuneate. Stamens 3. Stigmas laterally exserted near the tip of the spikelet. Caryopsis dorsally compressed, bixonvex to almost plano-convex.

K E Y T O S P E C I E S

1a. Leaves ovate, amplexicual; spikelets gibbous . . . . . brevifolium

1b. Leaves linear, to narrowly lanceolate not amplexicual; spikelets oblong or lanceolate not gibbous, or sometimes gibbous.

2a. Lemma of upper floret with finely transverse rugosities; nerves of upper glume and lower lemma obscure . . maximum

2b. Lemma of upper floret glabrous, without rugosities; nerves of both upper glume and lower lemma prominent.

3a. Spikelets narrowly lanceolate to lanceolate-oblong, acute.

4a. Lower glume ovate, acute or obtuse, one-third the length of the spikelet; spikelets about 2 mm long; panicle branches densely spiculate . . . auritum

4b. Lower glume orbicular, truncate or rotundate ; 1/6 to ½ the length of spikelets; spikelets 2.5-4 mm long; panicle branches loosely to closely spiculate.

5a. Spikelets narfowly lanceolate, leaf-blade broad, flat green . . . . paludosum

5b. Spikelets lanceolate to oblong-lanceolate; leaf-blade narrow, involute, glaucous . . . . . repens

3b. Spikelets oblong, ovate-oblong to elliptic, acute or obtuse.

6a. Nodes and leaf-sheaths hairy.

7a. Annuals; glumes with anastomosing nerves . . . . . cambogiense

7b. Perennials; nerves on glumes not anastomosing . . . . . khasianum

6b. Nodes and leaf-sheaths glabrous.

8a. Annuals; spikelets deciduous; branchlets capillary . . . . . psilopodium

8b. Perennials; spikelets persistent; branchlets stout.

9a. Spikelets acute, plants hairy all over . . . . . atrosanguineum

9b. Spikelets obtuse, plants glabrous or otherwise.

10a. Leaf-margin usually but not always pectinately ciliate below; lower floret epaleate; panicle effuse; leaf-base deeply cordate; ligule obscure . . . . . montanum

10b. Leaf-margins otherwise; lower floret paleate; leaf-base not cordate; ligule conspicuous.

11a. Inflorescence globular or ellipsoid; spikelets crowded; glumes and lemmas dull, matt with strongly marked nerves; branches and branchlets viscid; lower glumes three-fourth the length of spikelets . . . . . incantum

11b. Inflorescence usually panduriform or fan-shaped; spikelets sparse, glumes and lemmas shining not strongly nerved; branches and branchlets smooth; lower glume half the length of the spikelets . . . . . sarmentosum

Panicum atrosanguineum Hochst. ex A. Rich. Tent. Fl. Abyss. 2: 375. 1851; Bor Grass. Burm. Ceyl. Ind. Pak. 322. 1960.

Culms 10-50 cm high, erect, tufted, highly branched, sparsely hairy. Leaves linear-lanceolate, 5-20 x 0.5-0.8 cm, hairy, at least on the ventral surface, tapering from the rounded base, sheaths loose, hairy with serrate margin. Ligule a fimbriate ring of hairs. Panicles contracted or spreading, branches and branchlets capillary. Spikelets subsessile, 1.5-2 mm long, ovate, purplish-brown. Lower glumes subacute, clasping at base, 0.7-0.8 mm long, 5-nerved; upper glumes as long as the spikelets, 7-nerved, subacute. Lower florets neuter or male: lemma 1.5-2 mm long, ovate, subacute or acuminate, 7-9-nerved. Palea similar to lemma. Lodicules 2, coriaceous, nerveless, incurved. Stamens 3. Stigmas plumose.

Common in abandoned cultivated lands and in forest clearings.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1956, 1375 Araimai(Garo Hills).

Panicum auritum Presl. ex Nees Agrost. Bras. 176. 1829; Hook.f. Fl. Brit. India 7: 40. 1896; Bor in Fl. Assam 5: 231. 1940 et Grass. Burm. Ceyl. Ind. Pak. 324. 1960.

Culms prostrate or ascending from the prostrate base, rooting at nodes, 1-2 m high, glabrous. Leaves linear, tapering from a cordate base to an acute point, blades 15-35 x 1.5-3 cm, sheaths loose, shorter than the internodes, glabrous, margin

ciliate towards the mouth. Ligule a fimbriate ring. Panicles contracted, 10-35 cm long; branches erect, branchlets crowded. Pedicels scaberulose. Spikelets ovate-lanceolate, acute. Lower glumes suborbicular or subovate, 1 mm long, 3-nerved, acute or subacute; upper glumes ovate, oblong, 2-3 mm long, 5-nerved, acute. Lower florets male or neuter: lemmas 2-3 mm long, 5-nerved. Palea hyaline, 2-2.5 mm long, nerveless. Stamens 3. Styles 2, stigmas feathery.

Common in marshes and along the banks of streams, rivers, stagnant waters, etc.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1378 Lailad (Khasi Hills); 3019 Tasak (Garo Hills).

Panicum brevifolium Linn. Sp. Pl. 59. 1753; Bor in Fl. Assam 5: 237. 1940 et Grass. Burm. Ceyl. Ind. Pak. 324. 1960.

Culms prostrate or nearly so, rooting in the lower nodes. Leaves ovate, amplexicual, acute, margin scabrid, base ciliate, sheaths loose, glabrous or ciliate on the margin. Ligule a ring of cilia. Panicles 5-15 cm long. Lower branches longer than the upper, branchlets swollen at the base. Spikelets 1.5 mm long, ellipsoid, ovaid. Lower glumes 1 mm long, linear, obtuse, margin sparsely hairy, 3-nerved, median nerve prominent; upper glumes ovate, clasping the spikelets, acute, 2 mm long, 5-nerved, villous on the dorsal face. Lower florets neuter or male: lemma

broad, ovate, 5-nerved, acute. Palea cuneate, obtuse, margin thick. Lodicules very short, ovate, enclosing the stamens and styles. Stamens 3. Styles 2, stigmas feathery.

Common in shady places.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1271 Sohkha (Jaintia Hills); 1374 Lailad (Khasi Hills); 1411 Baghmara (Garo Hills).

Panicum cambogiense Balansa in Morot. Journ. de Bot. 4: 142. 1890; Bor Grass. Burm. Ceyl. Ind. Pak. 325. 1960.

Culms 15-60 cm high, geniculate at base, hairy at nodes. Leaves 5-20 x 0.5-1.2 cm, sparsely tubercle-based hairy, margin scabrid, sheaths hirsute, with itching hairs. Ligule a fringe of hairs. Panicles effuse, branched, 10-25 cm long. Rhachis and rhachilla scabrid. Spikelets shortly distant, ovoid, acute, yellow purple, 2-3 mm long. Lower glumes 1.5 mm long, cordate, acute, 7-nerved; upper glumes as long as the spikelets, 9-nerved, anastomosing. Lemmas 7-nerved. Palea hyaline, nerveless, smaller than the lemma. Lodicules 2, coriaceous, shining, clasping. Stamens 3. Styles 2.

A weed of cultivation.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1755 Burnihat (Khasi Hills).

Panicum incantum Trin. Gram. Pan. 200. 1826; Bor Grass. Burm. Ceyl. Ind. Pak. 326. 1960.

Culms straggling 10-16 m high, profusely branched, rooting in the lower nodes. Leaves ovate-oblong, 10-25 x 1-3 cm, glabrous or hairy, base rounded, acute at apex, shortly serrulate, sheaths loose, mature sheaths glabrous, younger sheaths densely hairy, margin ciliate. Ligule fimbriate. Panicles pyramidal or spreading, many branched. Spikelets crowded, globose or ovoid, 1.5-2 mm long, shortly pedicelled. Lower glumes 1 mm long, suborbicular, nerves impressed, ciliate; upper glumes ovate or suborbicular, dark or dull, ciliate, nerves distinct. Lower florets barren; lemma ovoid or oval, obtuse, 1-1.8 mm long, obscurely nerved. Palea coriaceous, infolded 1 mm long, oval-shaped, nerveless. Upper florets hermaphrodite: lemma similar to glumes. Palea coriaceous, 1 mm long, ovoid. Stamens 3. Caryopsis enclosed by the villous lodicules.

Frequent in forests climbing on tall shrubs and small trees. Very closely resembles to P. sarmentosum.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1358 Lailad (Khasi Hills).

Panicum khasianum Munro ex Hook.f. Fl. Brit. India 7: 54. 1896; Bor in Fl. Assam 5: 234. 1940 et Grass. Burm. Ceyl. Ind. Pak. 327. 1960.

Culms 1-3 m high, prostrate, or creeping, glabrous, rooting. Leaves broad, ovate, 5-15 x 1-3 cm, tapering to a fine point, base cordate, striate, margins scabrid, sheaths loose, cartilaginous, hyaline. Ligule reduced to a ciliate ring. Panicle decompound, branches filiform or capillary, angled, scaberulous. Spikelets lax, 2 mm long. Lower glumes very short, 1 mm long, nerves obscure; upper glumes as long as spikelets, 3-5-nerved. Lower florets: lemma membranous, 5-nerved. Upper florets: lemma pubescent. Palea ovate, obscurely 5-nerved. Stamens 3. Styles 2, stigmas plumose. Caryopsis ellipsoid.

Common in shady localities, in forests.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1176 Shillong, 1295 Pongtung (Khasi Hills); 1439 Tura (Garo Hills).

Panicum maximum Jacq. Collect. Bot. 1: 76. 1786; Hook.f. Fl. Brit. India 7: 49. 1896; Bor in Fl. Assam 5: 224. 1940 et Grass. Burm. Ceyl. Ind. Pak. 327. 1960.

Culms erect, tall up to 2 m high, glabrous. Leaves linear, 20-50 x 0.8-2 cm, glabrous, or with tubercle-based hairs, margins thick, scabrid, sheaths striate, loose, glabrous with tufts of cilia at the mouth. Ligule membranous. Panicles contracted or lax. Lower branches whorled, upper ones alternate or distichous, axis and rhachilla glabrous, capillary. Spikelets 2-3 nate. Spikelets 3 mm long, obtuse, sometimes purplish-green. Lower

glumes ovate, nerveless, 1 mm long; upper glumes ovate-lanceolate, acute, 5-nerved, glabrous. Lower florets male, 3 mm long: lemmas hyaline, acute, nerveless. Palea oblong, hyaline. Lodicules 2, ovate or linear, obscurely nerved. Lodicules ovate, subacute, transversely rugose. Styles 2, stigmas flexuous.

Common in open places specially in fallows. It is a good fodder grass and often grown for fodder.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1382 Umling (Khasi Hills).

Panicum montanum Roxb. Fl. Ind. 1: 315. 1820; Hook.f. Fl. Brit. India 7: 53. 1896; Bor in Fl. Assam 5: 234. 1940 et Grass. Burm. Ceyl. Ind. Pak. 329. 1960; Babu Herb. Fl. Dehra Dun 629. 1977.

Culms spreading 0.5-1.5 m high, glabrous, swollen at nodes, rooting from the lower prostrate base. Leaves oblong-lanceolate, 12-20 x 1-2 cm, rounded at base, pointed at apex, sparsely hairy, sheaths loose, glabrous, as long as or shorter than the internodes. Ligule membranous. Panicles branched, verticillate, axis scabrid. Spikelets ovate-lanceolate, 2 mm long. Lower glumes ovate, clasping at the base of the spikelets, 1 mm long, 3-5-nerved. upper glumes as long as the spikelets, suborbicular, 5-nerved. Lower florets barren: lemma 1.5-2 mm,long, obtuse, 5-nerved. Upper florets hermaphrodite: lemma coriaceous, glabrous, 2-2.5 mm long. Palea similar to lemma, acute. Stamens 3. Styles 2.

Caryopsis shining.

Common in bushes along the banks of streams, rivers, etc.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 3030 Shillong (Khasi Hills).

Panicum paludosum Rcxb. Fl. Ind. 1: 310. 1820; Bor in Fl. Assam 5: 229. 1940 et Grass. Burm. Ceyl. Ind. Pak. 329. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 370. 1966; Babu Herb. Fl. Dehra Dun 629. 1977. - - P. proliferum auctt. [non Lamk. Encycl. Meth. Bot. 4: 747. 1797]; Hook.f. Fl. Brit. India 7: 80. 1896.

Culms prostrate or ascending, swollen at the nodes, 30-60 cm long, Leaves linear, subulate, gradually tapering, sheaths loose, striate, glabrous, margin membranous. Ligule a dissected membrane with a ring of hairs behind. Panicle contracted when young, spreading at length, branches stout, angular, scabrid. Spikelets ovate-lanceolate, acute, 3-4 mm long. Lower glumes orbicular, clasping round the base of the spikelet, hyaline, nerveless; upper glumes 3-4 mm long, ovate, acute, 7-9-nerved. Lower florets neuter or male, lemma ovate, acute, as long as spikelets, 9-nerved Palea linear, hyaline, 2-3.5 mm long. Upper florets hermaphrodite; 3-4 mm long, ovate, acute, involute. Palea similar to lemma, auricled at the base. Stamens 3. Style 2, stigmas feathery.

Common in marshes, in abandoned fields, and a weed of cultivation. A good fodder grass. This species is very similar

and often confused with Panicum repens Linn. but can be separated mainly by the aquatic or marshy habit, more scabrid leaves, and a conspicuous ligule.

Fls. & Frts. : September to February.

Specimens examined: Myrthong 1558 Umling (Khasi Hills); 1612 Nongtalang (Jaintia Hills).

Panicum psilopodium Trin. Gram. Panic. 217. 1826; Hook.f. Fl. Brit. India 7: 46. 1896; Bor in Fl. Assam 5: 233. 1940 et Grass. Burm. Ceyl. Ind. Pak. 329. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 370. 1966; Babu Herb. Fl. Dehra Dun 629. 1977.

Culms tufted, branched from base, glabrous, 25-75 cm long. Leaves linear, 10-40 x 0.3-0.6 cm, glabrous, base rounded, blades tapering to a sharp point, margin scabrid, sheaths glabrous, margin membranous. Ligule erose, membraneus ring. Panicles 5-25 cm long, branches capillary, angled, scabrid, pedicels scabrid, swollen at the tip. Spikelets ovate-lanceolate, 2-3 mm long, usually purplish. Lower glumes orbicular, 1 mm long, 5-nerved, nerves anastomosing; upper glumes 3 mm long, ovate-lanceolate, 9-11-nerved, suborbicular, apex rounded, nerves anastomosing near the apex. Lower florets barren, lemma 3 mm long, 9-nerved, obtuse. Palea linear, hyaline, thickened at the margin. Stamens 3. Styles 2, stigmas feathery.

Common in abandoned cultivated lands and also in open localities specially in lower elevations.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1336 Shillong (Khasi Hills); 1953 Garumpani (Jaintia Hills).

Panicum repens Linn. Sp. Pl. ed. 2, 87. 1762; Hook.f. Fl. Brit. India 7: 49. 1896; Bor in Fl. Assam 5: 230. 1940 et Grass. Burm. Ceyl. Ind. Pak. 330. 1960.

Culms prostrate, ascending, rooting at base. Leaves linear-lanceolate, tapering, glaucous, glabrous, bases rounded or cordate, blades 5-12 x 0.4-0.5 cm, sheaths loose, striate, margin ciliate. Ligule a ring of hairs. Panicle irregularly branched at the angles, branches and branchlets angular, scaberulous. Spikelets ovate-lanceolate, acute, 3-4 mm long; lower glumes suborbicular, hyaline, nerveless, 1 mm long, clasping round the base of the spikelets; upper glumes ovate, acute, 3-3.5 mm long, 9-nerved. Lower florets male; lemma 3-3.5 mm long, 7-9-nerved, acute. Palea ovate, hyaline, 2-3 mm long. Stamens 2-3, anthers sagittate. Upper florets hermaphrodite, palea acute 2-3 mm long, stamens longer than those of the male florets. Styles short. Stigmas feathery.

Abundant in fallows.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1197 Shillong (Khasi Hills); 1417, 1983 Baghmara (Garo Hills).

Panicum sarmentosum Roxb. Fl. Ind. 1: 311. 1820; Hook.f. Fl. Brit. India 7: 54. 1896; Bor in Fl. Assam 5: 235. 1940 et Grass. Burm. Ceyl. Ind. Pak. 330. 1960.

Culms tall, up to 5 m high, scrambling , swollen at the nodes, hairy below the panicle. Leaves linear, lanceolate, softly hairy, 5-25 x 1-2 cm, margin scabrid, base rounded, contracted. sheaths loose, margin membranous, hairy towards the mouth. Ligule membranous. Panicles 10-15 cm long. Spikelets ovate, or elliptic, 1.8-2 mm long, lower glumes less than $\frac{1}{2}$ the length of the spikelets, 2-nerved; upper glumes as long as the spikelet, broadly ovate-lanceolate, 5-nerved. Lemma shorter than the upper glume, hyaline, infolded, nerveless. Palea ovate, smaller than the lemma. Lodicules 2, clasping the caryopsis. Stamens 3. Styles 2, stigmas feathery.

Common in open shrubby areas, climbing on other plants.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3180 Garumpani (Jaintia Hills); Joseph 45662 Umsaw (Khasi Hills)(ASSAM).

Paspalidium Stapf

Perennials, semi-aquatic or terrestrial grasses. Leaves linear, flat or involute; ligules reduced to a ciliate rim. Spikelets awnless, ovate, dorsally convex, falling entire from the pedicels, in spiciform racemes, 2-flowered, solitary, secund on the triquetrous rhachis. Lower floret male or reduced to an empty

lemma; upper floret hermaphrodite; glumes dissimialr, lower reduced to a small scale; upper mostly equalling the spikelets, 5-7-nerved with the nerves evenly distributed. Lower floret: lemma simialr to the upper glume. Palea present, slightly shorter than the lemma with inflexed flaps. Lemma of the upper floret oblong to elliptic, acute, crustaceous, 5-nerved. Paleas almost equalling the lemma, keeled. Lodicules 2, cuneate. Stamens 3. Styles distinct; stigmas laterally exserted. Caryopsis more or less enclosed by lemmas and paleas.

K E Y T O S P E C I E S

1a. Terrestrial; Spikes shorter than the internodes; upper glume shorter than the upper lemma; upper lemma granular, not rugulose. . . . . flavidum

1b. Marshy or semi-aquatic; spikes longer than the internodes; upper glumes half the length of the upper lemma; upper lemma rugulose, not granular. . . . . punctatum

Paspalidium flavidum (Retz.) A. Camus in Lecomte Fl. Gen. Indo-chine 7: 419. 1922; Bor in Fl. Assam 5: 258. 1940 et Grass. Burm. Ceyl. Ind. Pak. 333. 1960; Babu Herb. Fl. Dehra Dun 630. 1977. - - Panicum flavidum Retz. Obs. Bot 4: 15. 1786; Hook.f. Fl. Brit. India 7: 28. 1896.

Annuals. Culms prostrate and decumbent, tufted, glabrous, 10-80 cm long. Leaves linear, glabrous, 3-20 x 0.5-1 cm, scabrid on margin, acuminate at the apex, contracted at the base, sheaths

loose. Ligule a rim of hairs. Inflorescence a panicle of false spikes. Spikes erect, recurved, 5-9 in number. Spikelets gibbous, 1-2 mm long, few to many, arranged in two rows on the rhachis. Lower glumes orbicular, clasping the spikelets, nerveless; upper glumes ovate, involute, acute, 2 mm long, 7-nerved. Lower florets male or neuter; lemma convex, ovate, 3-nerved, enbracing the upper floret. Upper florets hermaphrodite, lemma coriaceous, enclosing the palea. Stamens 3. Styles 2, stigmas feathery. Caryopsis flat on two sides.

Common along roadsides in open areas as well as in forest clearings in lower elevations.

Fls. & Frts. August to January.

Specimens examined: Myrthong 1625 Muktapur (Jaintia Hills); 1676 Umling (Khasi Hills); 1720 Baghmara, 3009 Songsak (Garo Hills).

Paspalidium punctatum (Burm.) A. Camus in Lecomte Fl. Gen. Indo-chine 7: 419. 1922; Bor in Fl. Assam 5: 259. 1940 et Grass. Burm. Ceyl. Ind. Pak. 333. 1960. - - Panicum punctatum Burm. Fl. Ind. 26. 1768; Hook.f. Fl. Brit. India 7: 29. 1896.

Culms robust at the base, spongy, rooting at nodes. Leaves rigid, 5-30 x 0.5-0.8 cm, acute, narrowed at base, margin thick, scabrid. Ligule reduced to a ring of hairs. Spikes short, adpressed to the rhachis. Spikelets globose, numerous, deciduous; axis flexuous, furrowed. Lower glumes orbicular, clasping, 1 mm long, obscurely 3-nerved; upper glumes broad, ovate, acute, 2 mm

long, distinctly 3-nerved; lemma flat, 3-5-nerved. Palea cuspidate, punctate, Stamens 3. Stigmas 2, feathery. Caryopsis compressed.

Rare, collected once only from Baghmara.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1981 Baghmara (Garo Hills).

Paspalum Linn.

Annuals or perennials. Leaves linear to ovate-lanceolate, with a prominent white midrib. Racemes 2-nate, digitate or paniculate. Spikelets orbicular to oblong, obtuse, rarely acute, falling entire from the short pedicels, secund and usually 2 nate on the flattened or triquetrous rhachis, plano-convex. Lower florets barren. Upper hermaphrodite. Lower glume absent or minute, upper membranous, as long as lemma, rarely short or obsolete, 1-2-nerved. Lemmas equal or subequal, lower resembling the upper glume, 3-5-(rarely 7-) nerved; upper lemma chartaceous to subcoriaceous, faintly 5-7-nerved; palea subequal to the lemma, 2-nerved. Lodicules 2. Stamens 3. Stigmas laterally exserted near the tip of the floret. Caryopsis enclosed by the lemma and palea.

K E Y T O S P E C I E S

1a. Spikelets arranged in 4 rows on the broad rhachis . . . . . longifolium

1b. Spikelets arranged in 2 rows on a narrow or broad rhachis.

2a. Spikelets very small, 1 mm long; racemes numerous; margin of the upper glume glabrous . . . . . compactum

2b. Spikelets larger than above; racemes fewer, margin of the upper glume ciliate or glabrous.

3a. Spikelets fringed with fine white hairs from the margins of the upper glumes.

4a. Culms with long creeping stolons; spikelets 1.5-2 mm long, yellowish-green; racemes usually 2, rarely more . . . . . conjugatum

4b. Culms without stolons; spikelets 2-4 mm long; racemes usually 4-5 or more . .dilatatum

3b. Spikelets glabrous or pubescent, not ciliate on margins.

5a. Spikelets ovate-elliptic or orbicular, 1.8-2.2 mm long; lower lemma 3-nerved.. .. orbiculare

5b. Spikelets broadly elliptic, 2.5-4 mm long, lower lemma 1-nerved. . . distichum

Paspalum compactum Roth. Nov. Pl. Sp. 36. 1821; Hook.f. Fl. Brit. India 7: 12. 1896; Bor in Fl. Assam 5: 251. 1940 et Grass. Burm. Ceyl. Ind. Pak. 336. 1960.

Annuals. Culms decumbent from a prostrate rooting base, 10-30 cm high, glabrous. Leaves ovate-lanceolate, acute at apex, hairy on both surfaces, 3-6 x 0.5-1.5 cm, base decurrent, base amplexicual, sheaths loose, shorter than the internodes, very hairy. Ligule a ring of sparse cilia. Panicle contracted, elongate, 4-20 cm long, of many linear racemes, axis angled, glabrous, Spikelets in 2 rows, secund, globose, 1 mm long; lower glumes 0.

upper glumes suborbicualr, obtuse, 1 mm long, obscurely 3-nerved, glabrous, Lower florets barren. Upper florets hermaphrodite; lemma broadly ovate, clasping round the spikelets, 1-1.2 mm long, 3-nerved..Paleas 2, ovate, nerveless, embracing the stamens. Stamens 3. Styles 2.

Abundant along drains, channels, etc.

Fls.& Frts: : October to December.

Specimens examined: Myrthong 1863 Mawmluh (Khasi Hills).

Paspalum conjugatum Berg. in Act. Helvet Phys. Math. 7: 129. t. 8. 1772; Hook.f. Fl. Brit. India 7: 11. 1896; Bor in Fl. Assam 5: 255. 1940 et Grass. Burm. Ceyl. Ind. Pak. 336. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 371. 1966; Babu Herb. Fl. Dehra Dun 631. 1977.

Annuals or perennials. Culms stoloniferous, erect or prostrate from rooting base, 20-50 cm long, glabrous. Leaves linear, lanceolate, 5-15 x 0.5-1.2 cm, acute, margin scabrid, sheaths scabrid on margin, loose. Ligule a ring of hairs. Racemes usually 2 (if 3, the middle one reduced) 5-15 cm long, pale green. Spikelets biseriate, secund, axis erect, ridged. Spikelets ovate, ciliate on margin, 2 mm long; lower glumes 0; upper glumes orbicular, ciliate on margins, acute. Lower florets empty, upper florets hermaphrodite. Lemma membranous acute, 1-1.8 mm long, infolded. Palea similar to lemma but with 2 flaps at the base. Stamens 3. Styles 2, stigmas shortly feathery.

Abundant in the wet places in lower elevations.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1257 Sohkha (Jaintia Hills); 1346 Barapani (Khasi Hills); 1421 Baghmara (Garo Hills).

Paspalum dilatatum Poir. in Lamk. Encycl. Meth. Bot 5: 35. 1804; Bor in Fl. Assam 5: 256. 1940 et Grass. Burm. Ceyl. Ind. Pak. 338. 1960; Babu Herb. Fl. Dehra Dun 632. 1977.

Culms erect, up to 1 m high, leafy at the base. Rhizomes thick with fleshy roots. Leaves linear, acute, subauricled, 20-70 x 0.5-1.2 cm, margin cartilaginous with distant teeth, sheaths glabrous, except the basal ones, loose, membranous on margin. Racemes 4-5 or more, distant, hairy at the axils, 5-12 cm long, rhachis flat, 1-2 mm wide. Spikelets in 2 rows, ovate, compresses, secund, 3-4 mm long. Lower glumes 0; upper glumes ovate, acute, as long as the spikelets, margin hairy, 5-nerved. Palea coriaceous, nerveless, 1 mm long, acute, compressed, embracing the grain. Lower florets empty. Upper florets hermaphrodite, lemma ovate-lanceolate, 7-nerved. Stamens 3. Styles 2, stigmas 2, brown. Caryopsis ovoid, compressed.

Common in open areas. A good fodder grass.

Fls. & Frts. June to December.

Specimens examined: Myrthong 1001 Shillong (Khasi Hills); 1592 Jowai (Jaintia Hills).

Paspalum distichum Linn. Syst. Nat. ed. 10, 2: 855. 1759; Hook.f. Fl. Brit. India 7: 12. 1896; Bor in Fl. Assam 5: 255. 1940 et Grass. Burm. Ceyl. Ind. Pak. 338. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 371. 1966.

Annuals. Culms compressed, prostrate with erect flowering culms, glabrous or with few hairs at the nodes. Leaves flat, 5-15 x 0.5-1 cm, base rounded, blades shortly hairy, sheaths loose, hairy on margins. Ligules membranous, with few cilia at the back. Racemes usually 3, rhachis flat, scabrid, spikelets ovate-lanceolate, abruptly acute, 2.5-3.2 mm long, in 2 rows. Lower glumes rarely present; upper glumes as long as spikelets. 3-5-nerved. Lemma simialr to upper glumes. Palea 2, coriaceous, nerveless, embracing the inner whorls. Stamens 3. Styles 2, stigmas feathery, violet.

Common on freshly turned soils and on bunds forming good soil binders with their highly branched and interlaced culms. It is a good fodder grass.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1067, 1352 Shillong.

Paspalum longifolium Roxb. Fl. Ind. 1: 283. 1820; Bor in Fl. Assam 5: 252. 1940 et Grass. Burm. Ceyl. Ind. Pak. 339. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 371. 1966.

Culms up to 1 m high. Leaves 30-60 x 0.5-0.8 cm, linear, apex acute, margins scaberulous; sheaths loose, hairy near the

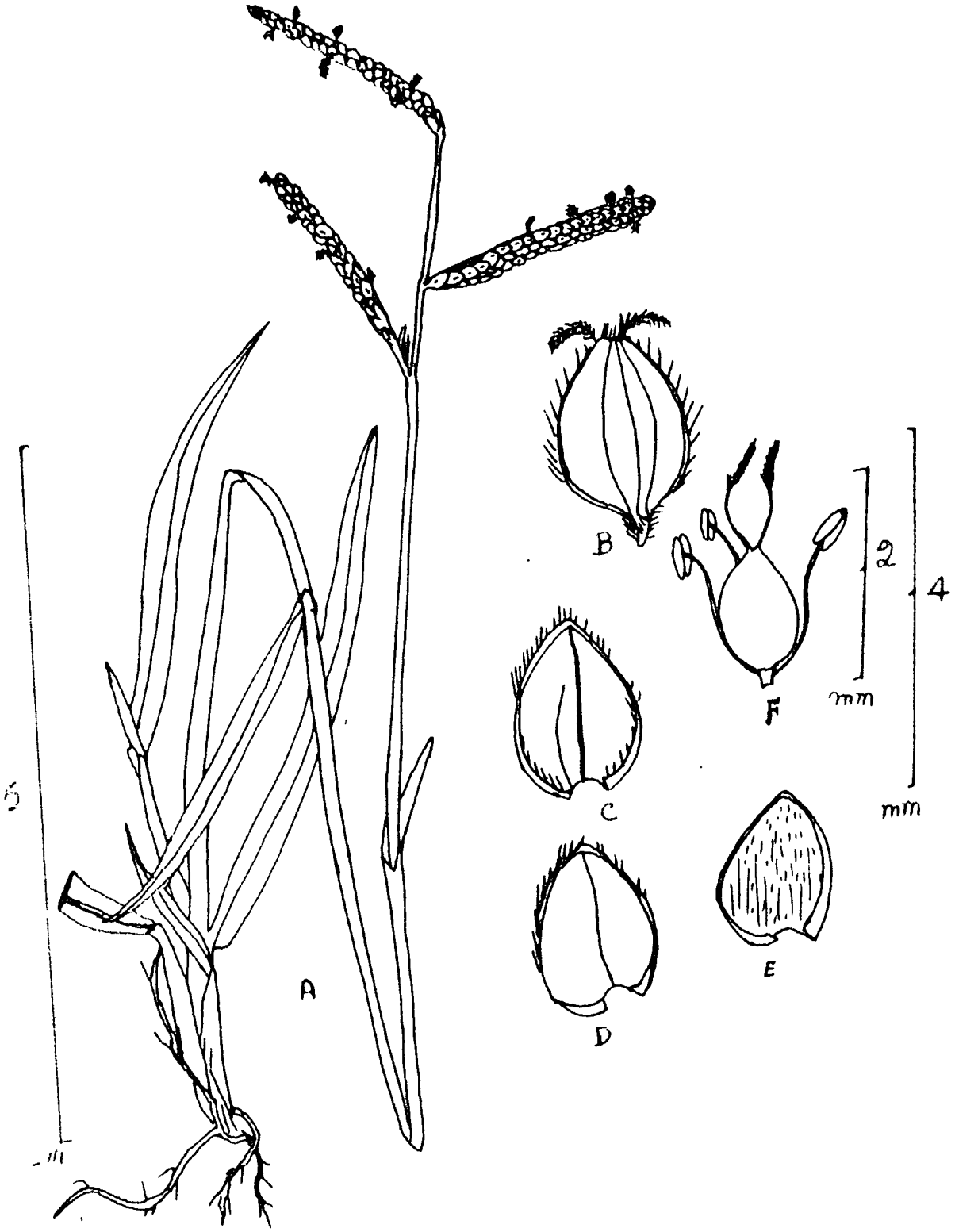


Plate 60 Paspalum orbiculare Forst. A.Habit, B.Spikelet, C.Lower Lemma, E.Palea, F.Gynoecium with Androecium.

mouth. Ligules short, membranous, ciliate. Inflorescence a panicle of false spikes, 8-10, 5-10 cm long, alternate, rhachis flat, undulated. Spikelets arranged in 4 rows, glabrous on the back, pedicels glabrous or sparsely hairy. Spikelets 2 mm long, lower glumes 0; upper glumes as long as the spikelets, concave, ovate-oblong or oblong, 3-nerved. Lower florets barren; lemma equal and similar to the upper glume. Upper florets hermaphrodite; lemma 1.5-2 mm long, obovate, obtuse, coriaceous, punctate, with infolded margin. Palea as long as lemma, with 2 flaps at the base. Stamens 3. Styles 2, stigmas brownish, feathery. Caryopsis blackish.

Common in open areas and in marshes. A good fodder grass.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1312 Shillong.

Paspalum orbiculare Forst. Fl. Insul. Austr. Prodr. 7. 1786; Bor in Fl. Assam 5: 254. 1940 et Grass. Burm. Ceyl. Ind. Pak. 340. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 372. 1966 (Plate 60).

Annuals or perennials. Culms erect, geniculate from base, glabrous, 20-70 cm high, branched from the lower nodes. Leaves linear, lanceolate, 10-40 x 0.5-1 cm, glabrous, margin scabrid, sheaths loose, glabrous or with few hairs. Ligule membranous. Spikes 2-5, alternate, rhachis flat, winged at the tip. Spikelets biseriate, secund, 1.5-2.5 mm long, plano-convex, orbicular, glabrous, acute. Lower glumes absent; upper glumes

ovate, as long as the spikelets, 1-3-nerved, involute, acute, glabrous. Lower florets empty, lemma as long as the upper glume, upper florets hermaphrodite; lemma as long as spikelets, shining. Stamens 3. Styles short, stigmas feathery.

Weed of cultivation, and in jhums and abandoned fields.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1032, 1052, 1112 , 1157 Shillong, 1235 Mawsmai (Khasi Hills).

Pennisetum L. Rich.

Annuals or perennials. Culms simple or profusely branched. Leaves linear, flat, convolute. Ligule reduced to a ciliate rim. Spikes solitary or fascicled, dense, linear, rarely oblong; bristles slender. Spikelets lanceolate or ovate-oblong, acute or obtuse, sessile or shortly pedicelled, deciduous. Lower floret male or barren; upper floret hermaphrodite. Glumes sub-equal. Lemma of lower floret equalling the spikelet, palea narrow, 2-keeled; lemma of upper floret 5-7-nerved, as long as spikelet. Palea similar to that of lower floret. Lodicules minute or absent. Stamens 3. Styles 2, slender, stigmas laterally or terminally exserted.

K E Y T O S P E C I E S

1a. Annuals; culms erect; spikes subcylindric, densely hairy; lemmas heteromorphous; lower 3-lobed; bristles densely plumose . . . . . polystachyon

1b. Perennials; culms prostrate; spikes not cylindric, usually enclosed by the leaf-sheaths, glabrous; lemma more or less similar, lower not lobed; bristles absent. . . . . clandestinum

Pennisetum clandestinum Hochst. ex Chiov. in Ann. Ist. Bot. Roma 8: 41. t. 5. f. 2. 1903; Bor in Fl. Assam 5: 296. 1940 et Grass. Burm. Ceyl. Ind. Pak. 344. 1960.

Perennials. Culms prostrate, profusely branched, rooting at nodes. Leaves numerous, linear. 5-15 x 0.5-0.8 cm, glabrous or hairy, tapering from rounded base, margin scabrid; sheaths overlapping, very hairy, clothing the branches. Ligule a rim of cilia. Inflorescence reduced, enclosed by the uppermost leafsheaths. Lower spikelets sessile, upper ones shortly pedicelled. Sessile spikelets 1.5-3 cm long, acute. Lower floret empty, reduced to a lemma. Upper florets hermaphrodite, lemma hyaline, many-nerved, distinct, 1.5-2 cm long. Palea lanceolate, 2-4-nerved, acute. Stamens 3, anthers protruding out from leafsheaths, flexuous. Styles whitish, hairy protruding out of the leafsheaths.

Introduction from tropical Africa to Meghalaya, usually grows in open grassy areas. It is a good soil binder.

Fls. & Frts. : December to February.

Specimens examined: Myrthong 1183 Shillong.

Pennisetum polystachyon (Linn.) Schult. Syst. Veg. Mant. 2: 146. 1824; Bor in Fl. Assam 5: 299. 1940 et Grass. Burm. Ceyl. Ind. Pak. 346. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 372. 1966. - - Panicum polystachyon Linn. Syst. Nat. ed. 10, 2: 870. 1759.

Annuals. Culms erect from a geniculate base, branched, glabrous or scabrid below the spike, 0.5-2 m high, reddish brown or crimson at maturity. Leaves linear, 20-80 long, acute, scabrid with tubercle-based hairs on both surfaces, sheaths shorter than the nodes, glabrous, margin ciliate. Ligule membranous, ciliolate. Spikes straight or flexuous, densely hairy, 5-20 cm long, main axis clothed with dense hairy involucres, scabrid; involucres with many bristles. Spikelets sessile, completely clothed with involucres of hairs; lower glumes glabrous, 4-5 mm long, hyaline, suppressed; upper glumes ovate, 3-lobed, 5-nerved. Lower florets male; lemma 4 mm long, 3-lobed, 5-nerved. Palea linear, as long as lemma, hyaline. Upper florets hermaphrodite, lemma 4 mm long, 5-nerved, 3-lobed. Palea similar to lemma. Stamens 3. Styles 2. stigmas flexuous, hairy.

Common in forest clearings and fallows, in lower elevations.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1381 Umling (Khasi Hills); 1455 Tura (Garo Hills).

Phalaris Linn.

Annuals or perennials. Leaves flat. Spikelets 3-flowered but apparently 1-flowered as the 2 lower florets are minute or rudimentary, laterally compressed, in contracted or loose spike-like panicle. Rhachilla disarticulating above the glumes. Glumes of the upper floret subequal, cymbiform, with winged keels. Empty lemma minute, membranous with callus at the base; fertile lemma rigid, thin, 5-nerved, acute. Palea equalling the lemma, 2-nerved. Lodicules 2, hyaline. Stamens 3. Stigmas terminally exserted. Caryopsis ovate, compressed with oblong hilum.

K E Y T O S P E C I E S

1a. Spikelets congested in cylindric or oblong spikes; lower and upper glumes winged . . . . *minor* var. *nepalensis*

1b. Spikelets in loose or contracted panicles; lower and upper glumes not winged... . . . *arundinacea*

Phalaris arundinacea Linn. Sp. Pl. 55. 1753; Hook.f. Fl. Brit. India 7: 221. 1896; Bor in Fl. Assam 5: 165. 1940 et Grass. Burm. Ceyl. Ind. Pak. 615. 1960.

Annuals. Culms erect from a prostrate stolon, rooting at the lower nodes, 30-100 cm high. Leaves linear, subulate, acute, glabrous, 10-40 x 1-1.5 cm, scabrid; sheaths loose, striate, glabrous. Ligule a white scarious membrane, 2-3 mm long. Panicles 10-20 cm long, contracted, branches short, 2-3 cm long. Spikelets

Rhizomes 5-10 mm thick, creeping. Leaves oblong-lanceolate, 15-20 x 4-6 cm, produced after flowers. Peduncles with inflorescence 10-20 cm high, clothed with reddish, oblong, hairy sheaths; Flowers condensed on rhachis; calyx 1 cm long, hairy; corolla tubes as long as calyx,,lobes 1.5 cm long; staminodes obovate-oblong, shorter than corolla lobes, yellowish white; lip ovate, as long as corolla lobes, yellowish white with brown dots. Filaments about 5 mm long; anthers equalling the filaments, apiculate. Ovary 1-celled, hairy; capsules 3-valved.

Rare, once reported from Tharia (Khasi Hills), on rock in dense forest.

Fls. & Frts. : January to April.

Specimens examined: Deka 16436 Tharia (Khasi Hills) (ASSAM).

Hitchenia Wall.

Hitchenia careyana Benth. in B. & H. Gen. Pl. 3: 643. 1834; Baker in Hook.f. Fl. Brit. India 6: 225. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 125. 1972.

Stems stout, 1-2 m high, clothed with sheaths. Leaves 40-60 x 10-15 cm, oblong-lanceolate, glabrous,hairy only along the midrib beneath. Spikes terminal, dense-flowered, 10-20 cm long; bracts oblong, obtuse, with recurved tips, lowers bracts tomentose, greenish, the rest glabrous, white with pale green in the middle, 3-6-flowered. Calyx cylindric 1 cm long, 3-lobed,

lemma reduced to an outgrowth at the base of the palea. Palea broad, 3 mm long, clasping the grain, 5-nerved, ciliate. Lodicules 2 mm long, hyaline, 1-nerved, keels ciliate. Stamens 3, anthers 1.5 mm long, styles 2, stigmas flexuous.

Common along water channels, streams, rivers, etc.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1537, 1857 Shillong.

Phragmites Trin.

Phragmites karka (Retz.) Trin. ex Steud. Nom. Bot. ed 2, 2: 324. 1841; Hook.f. Fl. Brit. India 7: 304. 1896; Bor in Fl. Assam 5: 88. 1940 et Grass. Burm. Ceyl. Ind. Pak. 416. 1960; Babu Herb. Fl. Dehra Dun 634. 1977.

Vern.-' Japung ' (K).

Perennials. Culms gregarious, 5 m high, developing from prostrate stolons, glabrous, jointed, hollow. Leaves linear, subulate, 1 m x 2-3 cm, striate, many-nerved, amplexicual, tpaering to a fine point, surface rough, margin scabrid; sheaths firmly clasping the internodes. Ligule a tuft of stiff hairs. Panicles large, decompound, 60 cm long, branches filiform. Spikelets linear, 5 mm long, acute, silky hairy at the base. Lower florets male or neuter and upper ones hermaphrodite; lower glumes linear, lanceolate, 5-8 mm long, acute, 3-5-nerved; upper glumes linear, lanceolate, acute, 3-nerved, as long as the lower glume. Lemmas subulate, linear, 1 cm long, 3-nerved. Palea hyaline,

3-4 mm long, toothed, nerveless. Stamens 3. Styles 2, stigmas feathery.

Common in marshes and wet places both in plain and on hills, culms are used for making mats after spliting open.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1490 Umroi (Khasi Hills).

Poa Linn.

Annuals or perennials. Leaves flat or convolute. Panicle contracted or spreading. Spikelets 2-6-flowered; rhachilla disarticulating above the glumes and between the lemmas, glabrous or sparsely hairy. All florets hermaphrodite or the uppermost imperfect. Glumes membranous, keeled, acute or obtuse, 1-3-nerved. Lemmas membranous, 5-7-nerved, awnless; paleas shorter than the lemmas. Lodicules 2, obscurely 2-lobed. Stamens 3. Stigmas laterally exserted. Caryopsis ovoid, oblong.

K E Y T O S P E C I E S

1a. Culms usually solitary; ligules short; keels of palea scabrid . . . . khasiana

1b. Culms tufted; ligules long; keels of palea ciliate . . . annua

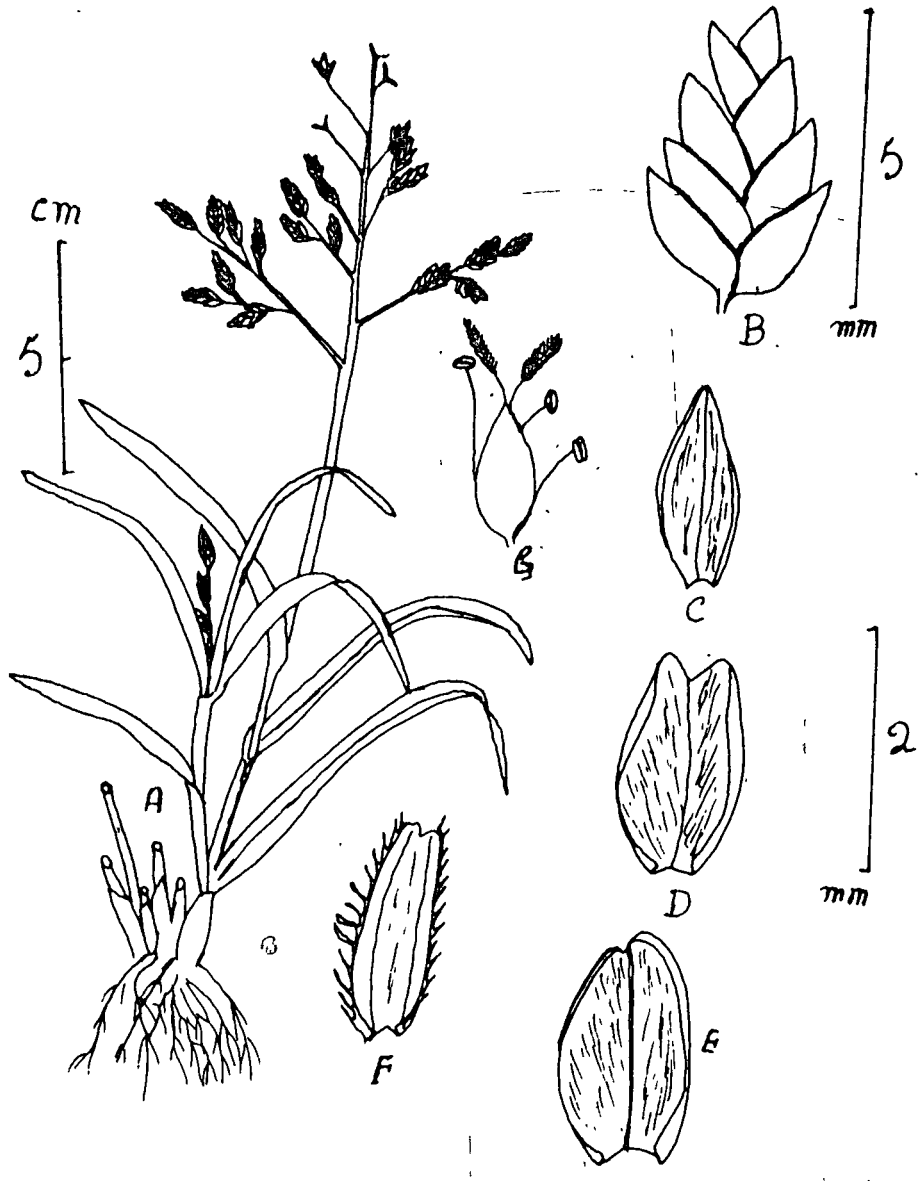


Plate 61 Poa annua Linn. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Nut with Carpels & Stamens.

Poa annua Linn. Sp. Pl. 68. 1753; Hook.f. Fl. Brit. India 7: 345. 1896; Bor in Fl. Assam 5: 68. 1940 et Grass. Burm. Ceyl. Ind. Pak. 555. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 372. 1966; Babu Herb. Fl. Dehra Dun 635. 1977 (Plate 61).

Annuals or perennials. Culms erect from a geniculate base, rooting at base, 35 cm long. Leaves flaccid, short, 2-10 x 0.2-0.4 cm, scabrid, acuminate, margin slightly scaberulous, sheaths loose, ligule membranous, truncate, up to 3 mm long. Panicles ovate, 4-8 cm long. Spikelets 5-6 mm long, compressed, with 3-6-flowered. Lower glumes acute, 1-nerved; upper glumes ovate-lanceolate, 3 mm long, 2-toothed, margin hyaline, 1-3-nerved. Lemmas 3 mm long, linear, palea ciliate, margin thick, with flexuous hairs. Stamens 3. Styles 2, stigmas plumose. Caryopsis ovoid.

Common all over Meghalaya, specially in grassy areas.

Fls. & Frts. : Major part of the year.

Specimens examined: Myrthong 1014 Shillong (Khasi Hills); 1601 Jowai (Jaintia Hills).

Poa khasiana Stapf in Hook.f. Fl. Brit. India 7: 343. 1896; Bor in Fl. Assam 5: 68. 1940 et Grass. Burm. Ceyl. Ind. Pak. 557. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 373. 1966.

Annuals. Culms suberect from the rooting base, glabrous, 20-60 cm high, leaves linear, tapering to a blunt point, glabrous,

margin scabrid, blades 10-20 cm long, sheaths striate; ligule short, membranous or erose, truncate. Panicles pyramidal, branches subsecund. Spikelets 4-8 mm long, 3-5-flowered, compressed, acute, spreading at maturity. Lower florets empty or male; lower glumes linear, 1-nerved, acute, 2-3 mm long, upper glumes ovate-lanceolate, 3 mm long, acute, 3-nerved; lemma of male florets broadly ovate, 3 mm long, 2-nerved, shortly 2-toothed, palea hyaline, 2-nerved, 2-3 mm long, truncate or erose, keels unequal. Stamens 3, anthers 1-1.5 mm long, upper florets hermaphrodite, similar to the male florets. Caryopsis linear, with a mark of style base.

Abundant on hill slopes in shady places and moist locality.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1533, 1656 Shillong.

Pogonatherum P. Beauv.

Usually perennial, densely tufted grasses. Culms slender, or branched with intervaginal innovation buds. Inflorescence a solitary, terminal raceme; rhachis fragile. Spikelets 2-nate, the sessile hermaphrodite and the pedicelled female, long awned. Lower glumes membranous, ciliate, truncate or rounded; upper glumes 1-nerved, 2-lobed, awned. Lemmas hyaline, empty or absent; palea persistent, equalling the lemma. Lodicules 0. Stamens 1-2. Stigmas exserted. Caryopsis obovate, slightly, laterally compressed.

KEY TO SPECIES

1a. Racemes more than 4 cm long; spikelets 4 mm long . . . . . rufo-barbatum

1b. Racemes less than 4 cm long; spikelets less than 4 mm long.

2a. Spikelets below 2 mm long; callus 2 mm long; lower floret empty or obsolete; upper florets with 1 stamen only . . crinitum

2b. Spikelets 2-3 mm long; callus less than 1.5 mm long; lower floret male; upper floret with 2 stamens, rarely 1 . . paniceum

Pogonatherum crinitum (Thunb.) Kunth. Enum. Pl. 1: 478. 1833; Hook.f. Fl. Brit. India 7: 141. 1896; Bor in Fl. Assam 5: 348. 1940 et Grass. Burm. Ceyl. Ind. Pak. 200. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 373. 1966. - - Andropogon crinitus Thunb. Fl. Jap. 40. t. 7. 1784.

Perennials. Culms tufted, wiry, glabrous, 10-15 cm high. Leaves linear, lanceolate, tapering to the acute point, and narrowed at base, glabrous, margin slightly undulate, sheaths loose, margin hyaline, shorter than the internodes with tufts of hairs at the mouth, base auricled. Ligule reduced. Raceme cylindric, pointed at both ends, densely silky. Spikelets linear, 1-2 mm long, sessile spikelets with tufts of cilia at the base. Lower glumes linear, truncate, nerveless; upper glumes 1.5 mm long, 1-nerved, 2-lobed, awned. Lemma hyaline, with long stout awn. Palea as long as caryopsis, hyaline, truncate, nerveless. Stamens 3. Styles 2. Caryopsis linear, lanceolate. Lower florets empty or male.

Abundant on walls and cut edges of roads, and rocky areas in streams.

Fls. & Frts. : March to January.

Specimens examined: Myrthong 1037 Shillong, 1827 Markasa (Khasi Hills); 1262 Sohkha (Jaintia Hills); 1409 Baghmara, 1444 Tura Peak (Garo Hills).

Pogonatherum rufo-barbatum Griff. Not. Pl. Asiat. 3: 81. 1851; Hook.f. Fl. Brit. India 7: 142. 1896; Bor in Fl. Assam 5: 346. 1940 et Grass. Burm. Ceyl. Ind. Pak. 202. 1960.

Perennials. Culms tufted, slender, 10-50 cm high, shining, stoloniferous. Leaves linear, tapering to an acute apex, auricled at the base, blades 5-10 x 0.4-0.6 cm, sheaths striate, loose, shorter than the internodes. Ligule truncate, 1 mm long. Racemes 3-6 cm long, rhachis ciliate on the angles, jointed. Spikelets, congested, sessile, 3-4 mm long with long awns. Callus hairy. Lower glumes broad, 2-lobed, 3-4 mm long, 3-nerved; upper glumes 4 mm long, 2-toothed with a prominent median nerve, prolonging into a long awn. Lower florets male; lemmas linear-lanceolate, hyaline, glabrous, nerveless, ciliate at the top. Palea as long as lemma, hyaline, obtuse. Upper florets hermaphrodite, lemma 3-4 mm long, hyaline, glabrous, nerveless, awn up to 2 cm long. Paleas as long as lemmas, hyaline. Stamens 3. Styles 2. Caryopsis cuneate.

Common on banks of streams and on the cut edges of old

roads on hills, forming dense tufts.

Fls. & Frts. : February to October.

Specimens examined: Myrthong 1069,1118 Shillong.

Pogonatherum paniceum (Lamk.) Hack. in Allg. Bot. Z. 12: 178. 1906; Bor in Fl. Assam 5: 347. 1940 et Grass. Burm. Ceyl. Ind. Pak. 202. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 373. 1966; Babu Herb. Fl. Dehra Dun 636. 1977. - - Saccharum paniceum Lamk. Encycl. Meth. 1: 595. 1785. - - Pogonatherum saccharoideum P. Beauv. Ess. Agrost. 176, 177. 1812; Hook.f. Fl. Brit. India 7: 141. 1896.

Perennials. Culms tufted, 10-40 cm high, glabrous. Leaves linear, lanceolate, acuminate, contracted at base, 4-8 cm long, scaberulous or glabrous, margin rough, sheaths striate, glabrous or hairy on margin. Ligules reduced to erose membrane. Raceme cylindric, 2-3 cm long. Spikelets linear, lanceolate or cuneate, sessile spikelets 4 mm long, callus hairy. Lower glumes ovate, denticulate at the top, 3-4 mm long, 3-nerved; upper glumes 2-3 mm long, ovate, obtuse, hyaline, hairy at the top, awns 1-1.5 cm long. Lower florets male; lemmas hyaline, obscurely nerved. Palea ciliate, 2-lobed. Stamens 3. Upper florets hermaphrodite; lemmas 2-toothed, hyaline, 2 mm long, nerveless. Styles 2, stigmas plumose. Caryopsis ovoid.

Common in shady areas along road cuttings on hills.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1293 Pongtung, 1523 Barapani (Khasi Hills); 1413 Baghmara, 3109 Tasak (Garo Hills); 1591 Jowai (Jaintia Hills).

Polytoca R. Br.

Perennial, tall, erect, monoecious grasses with bearded nodes and flat leaves. Inflorescence of 3 or more fragile, male racemes arranged on peduncles and several lateral female racemes, surrounded by the spathiform sheaths ; rhachis fragile. Male spikelets 2-flowered, or the lower floret abortive. Glumes subequal, mucronate or with tailed appendage; lower and upper lemmas thinner, palea 2-nerved. Lodicules 2. Stamens 3. Female spikelets apparently 1-flowered; lower glume bony, truncate or 2-toothed; upper glume narrower; lemmas 2, membranous, paleate, lodicules absent. Staminode 0. Stigmas long, laterally exserted, dark brown. Caryopsis enclosed by lower glumes and the adjacent joints.

K E Y T O S P E C I E S

1a. Male spikelets 5-6 mm long, acute; lower glumes with 2-hyaline appendages at the base, ending in a long deciduous awn; fruit case 7 mm long . . . wallichiana

1b. Male spikelets above 6 mm long; lower glumes not awned and without appendages; fruit case up to 1 cm long . . . . digitata

Polytoca digitata (Linn.f.) Druce in Rep. Bot. Exch. Club. Brit. Isles 4: 64. 1916; Bor in Fl. Assam 5: 456. 1940 et Grass.

Burm. Ceyl. Ind. Pak. 267. 1960. - - Apluda digitata Linn.f. Suppl. Pl. 434. 1781. - - Polytoca bracteata R. Br. in Benn. Pl. Rar. Jav. 20: t. 5. 1838; Hook.f. Fl. Brit. India 7: 101. 1896.

Annuals. Culms robust, glabrous, hairy at nodes up to 1.5 m high. Leaves linear, 25-60 x 0.5-1.5 cm, narrowed at base and tapering to the apex, blades hirsute with tubercle-based hairs; sheaths striate, loose, hairy. Ligule membranous, hairy. Inflorescence developing at the axil of a spathiform sheaths or leaf-base. Upper racemes male and lower ones female. Rhachis fragile. Male spikelets ovate, acute, 5-8 mm long, pubescent; lower glumes as long as spikelets, obtuse, mucronate, many-nerved; upper glumes strongly acuminate. Lower florets empty or male; lemmas hyaline, acute, palea very thin. Stamens 3. Female spikelets 2-nate, 1-2 cm long, lower glumes obtuse, 5-8 mm long, acuminate, villous towards the base and margins; upper glumes shorter than the lower glumes, acuminate, 7-nerved; lemmas hyaline, acute, equalling the upper glumes. Palea thin. Styles 2, stigmas long, pinkish-brown, feathery.

Frequent in deep forests in association with tall grasses.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1343 Barapani (Khasi Hills).

Polytoca wallichiana (Nees) Benth. in Journ. Linn. Soc. Bot. 19: 52. 1881; Hook.f. Fl. Brit. India 7: 101. 1896; Bor in Fl. Assam 5: 457. 1940 et Grass. Burm. Ceyl. Ind. Pak. 267. 1960; Cyathorhachis wallichiana Nees ex Steud. Syn. Pl. Glum. 1: 403. 1855.

Annuals. Culms erect, leafy, branched at the base, glabrous. Leaves linear, lanceolate, tapering to a fine point, 20-80 x 0.1-0.4 cm, tubercle-based hairy, margin scabrid, base cordate; sheaths loose, glabrous. Ligule absent or with long, lacerate membrane, 5-8 mm long. Racemes terminal, subdigitate. Male racemes, terminal, female spikelets at the base or in the middle. Pedicelled male spikelets 6-8 mm long, ovate-lanceolate, acute. Seesile spikelets seated at the base of the pedicelled ones, 6 mm long, obtuse. Lower glumes lanceolate, acute, 7-nerved, 5-8 mm long, margin scabrid; upper glumes ovate-lanceolate, 7 mm long, 5-nerved, subobtuse. Lemmas of sessile spikelets linear, lanceolate, 7 mm long, subobtuse, 3-nerved, hyaline, glabrous, with short cilia at the apex. Palea flexuous, hyaline, membranous, linear, nerveless, Lodicules 2, as long as paleas. Stamens 3, female spikelets 2-nate, 1-1.5 cm long; lemmas as long as spikelets, hyaline, many-nerved, clasping the rhachis; styles 2, stigmas brownish pink, feathery.

Common in fallows and on roadsides, in lower elevations.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1731 Burnihat, (Khasi Hills).

Pseudechinolaena (Hook.f.) Stapf

Pseudechinolaena polystachya (H. B. & K.) Stapf in Prain Fl. Trop. Afr. 9: 495. 1919; Bor in Fl. Assam 5: 266. 1940 et Grass. Burm. Ceyl. Ind. Pak. 352. 1960. - - Echinolaena

polystachya H. B. & K. Nov. Gen. et Sp. 1: 119. 1816.

Perennials. Culms feably ascending from prostrate base, rooting from below. Leaves 2-6 x 0.8-1.2 cm, very thin, sparsely hairy, blades ovate-lanceolate, acute, base narrowed, apex acute, sheaths loose, margin hiary, towards the mouth. Ligule a long membranous structure, 2-2.5 mm long. Inflorescence a panicle with distant racemes. Rhachis slender, branches 4-6, sometimes reduced to a single spikelet. Spikelets secund, 3-4 mm long, convex, spiny on the glumes. Lower glumes green, 3-5-nerved, interrupted, apex cuspidate or awned; upper glumes 3 mm long, very broad, convex, 5-7-nerved, dorsal surface with stout, curved, sticky spines. Lemmas equal to the upper glumes, 5-nerved, dorsal surface glabrous. Palea linear, as long as lemma, hyaline, faintly nerved, acute. Lodicules 2, coriaceous, acute, enclosing the inner segments. Stamens 3, anthers pale pinkish white. Styles 2. Caryopsis elliptic.

Common in forests forming a ground vegetation. The spikelets due to the spiny glumes stick to moving animals and man when come in contact, and thus get easily dispersed.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1228 Mawsmai (Khasi Hills); 1445 Tura peak (Garo Hills).

Pseudopogonatherum A. Camus

Pseudopogonatherum contortum (Brongn.) A. Camus in Lecomte Fl. Gen. Indo-chine 7: 255. 1922; Bor in Fl. Assam 5: 344. 1940 et Grass. Burm. Ceyl. Ind. Pak. 204. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 374. 1966. - - Pogonatherum contortum Brongn. in Duperr. Voy. Coq. Bot. 90: 17. 1831. - - Pollinia articulata Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2: 273. 1832; Hook.f. Fl. Brit. India 7: 109. 1896.

Annuals. Culms 20-40 cm high, slender, tufted. Leaves filiform or narrowly linear, acute, scabrid, 10-25 x 0.2 cm, with a prominent median nerve, sheaths glabrous, ligules ciliate. Panicles dense, axis silky hairy, racemes alternate or opposite, 5-6 cm long; spikelets all pedicelled, 2-2.5 mm long, lanceolate. Lower glumes papyraceous, membranous towards the apex, shining, truncate, 2-toothed; upper glumes papyraceous, ovate-lanceolate, 1-nerved, obtuse; margins glabrous, awned, Lower florets barren: lemma about 1 mm long, obtuse, nerveless. Upper floret hermaphrodite: lemmas membranous, 1-nerved, entire, 2-toothed, with robust awn up to 3 cm long. Palea absent. Lodicules 2. Stamens 3, Stigmas 2, short, feathery.

Common on rocks along the banks of streams and on slopes in secondary forests.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 2989 Barapani (Khasi Hills).

Pseudosorghum A. Camus

Pseudosorghum fasciculare (Roxb.) A. Camus in Bull. Mus. Hist. Nat. Paris 26: 662. 1920; Bor in Fl. Assam 5: 353. 1940 et Grass. Burm. Ceyl. Ind. Pak. 205. 1960; Babu Herb. Fl. Dehra Dun 637. 1977. - - Andropogon fascicularis Roxb. Fl. Ind. 1: 269. 1820; Hook.f. Fl. Brit. India 7: 177. 1896.

Annuals. Culms erect, up to 1 m high, branched at base, glabrous. Leaves linear, 20-50 x 0.5-0.8 cm, hairy at the base, tapering to the setaceous apex, margin scabrid, sheaths striate, glabrous or hairy towards the mouth on both sides of the prominent rib. Ligule 2-4 mm long, ciliolate, truncate. Inflorescence a panicle from bract-like leaves, purplish or dark brown; Racemes numerous, Spikelets 4-5 mm long, acute. Lower glumes as long as the spikelets, 9-nerved, ciliate, near the apex; upper glumes equal to the lower, lanceolate, acute, 5-7-nerved. Lower florets barren; lemmas 4 mm long, 2-nerved, ciliate. Upper florets hermaphrodite; lemmas hyaline, 2-lobed, sagittate, awned in between the lobes. Stamens 3, styles 2, stigmas yellow.

Occasional amidst tall grasses in margins of forests.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 3074 Mongpoh (Khasi Hills).

Rottboellia Linn. f.

Rottboellia exaltata Linn.f. Nov. Gram. Gen. 40. t. 1. 1779 et in Suppl. Pl. 114. 1781; Hook.f. Fl. Brit. India 7: 156. 1896; Bor in Fl. Assam 5: 444. 1940 et Grass. Burm. Ceyl. Ind. Pak. 206. 1960; Babu Herb. Fl. Dehra Dun 638. 1977.

Annuals. Culms erect, terete, up to 3 m high, glabrous rooting from the lower nodes. Leaves linear, lanceolate, 15-50 x 1-2 cm, glabrous, tapering to a fine point, margin scabrid, sheaths loose, hirsute with itching hairs; ligule a membranous ring of cilia. Inflorescence a raceme, 6-12 cm long, stiff, jointed. Spikelets articulated on the joint, 6 mm long. Sessile spikelets 4-5 mm long, ovate. Lower glumes 6 mm long, 2-toothed, scabrid, many-nerved; upper glumes cymbiform, 1.5 cm long, acute; lemma 4-6 mm long, acute, 3-5-nerved, ovate. Palea hyaline, 2-toothed. Stamens 3, anthers brown, elongated. Styles 2, stigmas feathery. Pedicelled spikelets similar to sessile ones, but more pointed.

Common in jhum fallows, of lower elevation.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1757 Burnihat (Khasi Hills); 1954 Tura, 1996 Songsak (Garo Hills).

Saccharum Linn.

Tall, perennial grasses with solid culms. Leaves with prominent white midrib, flat or involute. Panicles spreading or contracted. Spikelets all alike, 2-flowered, one sessile and the other pedicelled. Lower reduced and the other hermaphrodite. Glumes membranous, hyaline upwards; upper glumes 1-5-nerved. Lemmas hyaline, upper lemmas usually with a strong awn or mucro; lodicules 2. Stamens 3. Stigmas laterally exserted. Caryopsis oblong to subglobose.

K E Y T O S P E C I E S

1a. Spikelets awnless.
  2a. Peduncles hairy below the panicle; rhachis highly fragile; hairs silvery-white . . . . . spontaneum
  2b. Peduncles not hairy; rhachis less fragile.
    3a. Joints 3.5-4 mm long; pedicels 2-2.5 mm long; panicles congested, non silky . . . . . arundinaceum
    3b. Joints longer than 3a above; pedicels 3-4 mm long; panicles not congested, silky . . . . . procerum
1b. Spikelets awned.
  4a. Panicles decompound, up to 15 cm across; very thick with crowded spikelets . . ravennae
  4b. Panicles simple, very narrow, shorter with lax spikelets.
    5a. Upper lemmas entire at the apex; spikelets 3-3.5 mm long, surrounded by mauve coloured hairs . . . . . rufipilum
    5b. Upper lemmas 2-fid at the apex; spikelets 4-5.5 mm long, surrounded by pale golden hairs . . . . . longisetosum

Saccharum arundinaceum Retz. Obs. Bot 4: 14. 1786; Hook.f. Fl. Brit. India 7: 119. 1896; Bor in Fl. Assam 5: 320. 1940 et Grass. Burm. Ceyl. Ind. Pak. 211. 1960.

Perennials. Culms tall, up to 5 m high, rootstock stout. Leaves linear, up to 1.5 m long, glabrous, tapering to a fine point, scabrid on margin, sheaths striate, glabrous; ligule truncate, membranous with dense hairs at the back. Panicle 30-50 x 15-20 cm, densely silky, Branches filifrom, fragile. Sessile spikelets linear, acute, 3 mm long; lower glumes flat, nerveless with few long hairs, callus with tufts of cilia; upper glumes linear, acute, 2-2.5 mm long, glabrous, 1-nerved. Lemmas hyaline, oblong-lanceolate, acute. Palea hyaline, 1 mm long, nerveless, mucronate. Stamens 3. Styles 2, stigmas linear, hairy.

Common in fallows and abandoned cultivated lands, in lower elevations.

Fls, & Frts. : October to February.

Specimens examined: Myrthong 1348 Barapani (Khasi Hills); Panigrahi 22582 Rongram (Garo Hills); Deka 13820 Garumpani (Jaintia Hills) (ASSAM).

Saccharum longisetosum (Anders.) Narayanaswami ex Bor in Fl. Assam 5: 461. 1940 et Grass. Burm. Ceyl. Ind. Pak. 211. 1960. Erianthus longisetosus Anders. ex Benth. in Journ. Linn. Soc. 19: 67. 1881; Hook.f. Fl. Brit. India 7: 124. 1896; Bor in Fl. Assam 5: 324. 1940.

Perennials. Culms tall, 1-3 m high, cylindric, jointed, glabrous. Leaves broadly lanceolate, 20-40 x 2-4 cm, acuminate, margin scabrid, sheaths loose, clasping below with a ring of silvery hairs. Ligule membranous, truncate or a ring of hiars. Panicles clothed with golden yellow or brown hairs, spreading at anthesis. Rhachis glabrous, pedicels swollen at the tip. Spikelets lanceolate, very hairy, 5 mm long. Lower glumes of pedicelled spikelets hairy, acute, 2-4-nerved, median nerve bifurcated at the tip; upper glumes 1-nerved. Lemmas hyaline, awned, awn up to 2 cm long. Stamens 3; styles 2, stigmas plumose. Lower florets empty.

Common along the banks of streams in secondary forests.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 3104 Burnihat, 1168 Tynring (Khasi Hills); 3088 Baghmara (Garo Hills); 1353 Sohkha (Jaintia Hills).

Saccharum procerum Roxb. Fl. Ind. 1: 248. 1820; Bor in Fl. Assam 5: 321. 1940 et Grass. Burm. Ceyl. Ind. Pak. 213. 1960.

Perennials. Culms tufted, tall, up to 4 m high, glabrous. Leaves linear, 1.25 m x 2-5 cm, midrib prominent, margin scabrid, sheaths loose, striate; ligule membranous, truncate, with long tufted cilia at the back. Panicles highly branched, up to 60 x 15 cm. Spikelets 2.5-4 mm long, pedicels 2-3 mm long. Sessile spikelets similar to the pedicelled spikelets; lower glumes ovate-oblong, 3.3 mm long, acute, 2-nerved; callus with long

hairs; upper glumes similar to the lower ones but 1-nerved, shortly aristate. Lemmas hyaline, nerveless, margin ciliate, shortly awned. Palea similar to lemma but awnless. Stamens 3, anthers elongated, twice as long as the stigmas. Stigmas 2, feathery.

Frequent on sandy soils, on banks of streams, rivers and in eroded areas.

Fls. & Frts. : December to February.

Specimens examined: Myrthong 1422 Baghmara, 1465 Phulbari (Garo Hills); Deka 4653 Dawki (Jaintia Hills); Sherma 16469 Nongpoh (Khasi Hills) (ASSAM).

Saccharum ravennae (Linn.) Murray Syst. Veg. 88. 1774; Bor in Fl. Assam 5: 461. 1940 et Grass. Burm. Ceyl. Ind. Pak. 213. 1960. - - Andropogon ravennae Linn. Sp. Pl. ed. 2: 1481. 1763. - - Erianthus ravennae (Linn.) P. Beauv. Ess. Agrost. 14. 1812; Hook.f. Fl. Brit. India 7: 121. 1896.

Tall annuals or perennials. Culms up to 5 m high, robust, base thick, and covered with dense short greyish yellow hairs. Leaves linear, 1-2 m x 3-5 cm, with a prominent median nerve, glabrous, scabrid on margin, sheaths long, up to 1 m long, glabrous. Ligule a fringe of hairs. Panicles 30-50 x 6-10 cm, pinkish-violet when young. Axis polished, cylindric, rhachis angular, scabrid on angles. Branches numerous, filiform fragile, few-flowered. Spikelets ovate-lanceolate, acute, 4 mm long, covered with many long hairs; lower glumes ovate-lanceolate,

Plate 62 Saccharum rufipilum Steud. A.Habit, B.Spikelet, C.Lower Glume, D.Upper Glume, E.Lemma, F. Palea, G.Gynoecium with Androecium.

2-3 mm long, acute, 2-3-nervea, infolded; upper glumes as long as lower glumes but 1-nerved. Lemmas hyaline, linear, shortly awned. Palea membranous, hyaline. Stamens not seen. Styles 2, stigmas feathery.

Common in foothills and in the forest clearings, specially in moist localities.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1370 Lailad (Khasi Hills).

Saccharum rufipilum Steud. Syn. Pl. Glum. 1: 409. 1855; Bor Grass. Burm. Geyl. Ind. Pak. 213. 1960. - - Erianthus fulvus Nees ex Hack. in DC. Monogr. Phan. 6: 147. 1889; Hook.f. Fl. Brit. India 7: 123. 1896. - - E. rufipilus (Steud.) Griseb. in Nachr. Gesell. Wissensch. Goett. 93. 1868 (Plate 62).

Tall annuals. Culms erect 1-2 m high, tufted, hairy at the nodes and below the panicle. Leaves long, linear, 1-1.5 m x 0.5-1 cm, midrib prominent, margin scabrid, apex filiform, setaceous, sheaths striate, loose, usually with brown spots. Ligules membranous or ciliate, truncate, 1-2 mm long. Panicles ovate-lanceolate, 20-40 x 0.5-1 cm. Axis tomentose, primary branches 5-8 cm long, many jointed. Spikelets densely hairy. Pedicels as long as spikelets or longer, very hairy. Lower glumes 5-6 mm long, lanceolate, apex hyaline, 2-nerved; upper glumes longer than lower ones, glabrous. Lemmas small, hyaline, with 2-3 cm long awns. Palea hyaline. Stamens 3. Styles 2, stigmas

feathery; lower florets empty.

Mostly in sandy soils both in high and low elevations along road sides and road cuttings.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1168 Shillong (Khasi Hills); Panigrahi 22851 Baghmara (Garo Hills); Kanjilal 10424 Jowai (Jaintia Hills) (ASSAM).

Saccharum spontaneum Linn. Mant. Alt. 183. 1771; Hook.f. Fl. Brit. India 7: 118. 1896; Bor in Fl. Assam 5: 319. 1940 et Grass. Burm. Ceyl. Ind. Pak. 214. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 374. 1966; Babu Herb. Fl. Dehra Dun 639. 1977.

Vern.-'Kdaitmiaw' (K).

Perennials, reed-like grasses. Culms gregarious from dense rootstocks, 1-4 m high, glabrous, silky hairy below the panicle. Leaves linear, 0.5-1.5 cm x 5-8 mm, tapering to a capillary point, glabrous, midrib prominent, margin scabrid, sheaths overtopping, loose, glabrous, margin membranous, basal sheaths brown spotted or pink. Ligule truncate, 2 mm long, hairy on edges. Panicles contracted. Main axis fragile, 20-30 cm long, silky white. Spikelets 4-6 mm long, callus densely silky hairy. Lower glumes subulate, hyaline, 2-nerved, 2-lobed, ciliate; upper glumes similar to the lower ones, but mucronate, 1-nerved. Lower florets barren; lemmas 4-5 mm long, ovate, acute, nerveless.

Upper florets hermaphrodite; lemmas subulate or ovate, or reduced to a hyaline membrane. Palea hyaline, very small. Lodicules 2, similar to the palea. Stamens 3. Caryopsis pyramidal.

Abundant in grasslands, specially in wet places on embankments or on deposited lands of streams, rivers, etc. Culms used for thatching purposes.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1093 Shillong, 1208 Mawmluh (Khasi Hills).

Sacciolepis Nash

Annuals or perennials. Culms simple. Leaves flat or convolute. Inflorescence a spiciform, cylindrical panicle. Spikelets elliptic, or lanceolate to ovate, turgid or laterally compressed, falling entire from the short pedicels, 2-flowered. Lower florets male or sterile and the upper hermaphrodite. Glumes unequal with rib-like nerves, usually 7-9-nerved-(rarely 5 or 13-) nerved. Lemmas similar to the upper glumes, 5-nerved. Paleas equalling the lemmas, 2-nerved. Lodicules 2. Stamens 3. Stigmas subterminally exserted from near the tip of the spikelets. Caryopsis elliptic.

K E Y T O S P E C I E S

1a. Spikelets subglobose, obtuse . . myosuroides
1b. Spikelets obliquely lanceolate, acute.

2a. Culms robust, spongy; lower glumes less than half the length of the spikelets; spikelets 4-5 mm long, in interrupted, crowded fascicles . . . interrupta

2b. Culms slender not spongy; lower glumes half the length of spikelets; spikelets less than 4 mm long, in continuous, spiciform panicle . . indica

Sacciolepis indica (Linn.) A. Chase in Proc. Biol. Wash. 21: 8. 1908; Bor in Fl. Assam 5: 216. 1940 et Grass. Burm. Ceyl. Ind. Pak. 357. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 375. 1966; Babu Herb. Fl. Dehra Dun 639. 1977. - - Panicum indicum Linn. Mant. Pl. 2: 184. 1771; Hook.f. Fl. Brit. India 7: 41. 1896.

Annuals. Culms erect from slightly geniculate base, branched, leafy at base, 20-70 cm high. Leaves linear, lanceolate, subacute, 4-8 x 0.5-0.8 cm, glabrous, sheaths loose, striate, glabrous. Ligule a membranous ring. Panicles cylindric, 4-8 x 0.4-0.8 cm, olive-green or sometimes with margin purplish. Spikelets dense, 2.5-3.5 mm long, acute. Lower glumes half as long as spikelets, acute, 3-5-nerved; upper glumes 9-11-nerved, acute. Lemmas similar to the upper glumes, 7-9-nerved. Palea hyaline, nerveless, enclosing the caryopsis. Stamens 3, anthers black, short. Styles 2, stigmas feathery. Caryopsis oblong, lanceolate.

A weed of paddy fields and in marshes. A good fodder grass.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1234 Mawmluh (Khasi Hills); 1641 Jowai (Jaintia Hills).

Sacciolepis interrupta (Willd.) Stapf in Prain Fl. Trop. Afr. 9: 757. 1920; Bor in Fl. Assam 5: 215. 1940 et Grass. Burm. Ceyl. Ind. Pak. 358. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 375. 1966; Babu Herb. Fl. Dehra Dun 640. 1977. - - Panicum interruptum Willd. Sp. Pl. 1: 341. 1798; Hook.f. Fl. Brit. India 7: 41. 1896.

Annuals or perennials. Culms decumbent, branched at the base, glabrous, up to 30 cm high. Leaves 6-15 x 0.5-0.8 cm, hairy, subacute, sheaths striate, loose, glabrous. Ligule short, membranous. Spikes cylindric, 15 cm long, olive-grey. Spikelets condensed on axis, 3-5 mm long, acute; lower glumes ovate, subacute subacute, 2 mm long, 5-7-nerved; upper glumes as long as the spikelets, obtuse, 9-11-nerved. Lemmas similar to upper glumes. Palea hyaline. Stamens 3. Styles 2, stigmas feathery. Caryopsis shining, lanceolate.

Frequent in marshes and paddy fields.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1007 Shillong.

Sacciolepis myosuroides (R. Br.) A. Camus in Lecomte Fl. Gen. Indo-chine 7: 460. 1922; Bor in Fl. Assam 5: 217. 1940 et Grass. Burm, Ceyl. Ind. Pak. 358. 1960. - - Panicum myosuroides

R. Br. Prodr. 189. 1810; Hook.f. Fl. Brit. India 7: 42. 1896.

Annuals. Culms suberect, branched from slightly geniculate base, 30-70 cm high, glabrous. Leaves linear, lanceolate, 20-30 x 0.5-0.8 cm, densely hairy on both surfaces, margin finely scabrid, tapering to a fine point, base slightly rounded, sheaths striate, glabrous. Ligule membranous. Spikes cylindric, 10-20 cm long, olive-grey. Spikelets fascicled, 3.5-4.5 mm long; lower glumes 3-5-nerved; upper glumes 7-9-nerved, glabrous. Lemma longer than the upper glumes, 7-9-nerved, apex blunt. Palea hyaline, nerveless. Lodicules as long as the caryopsis, hyaline, nerveless. Stamens 3, anthers 2-2.5 mm long. Styles 2, stigmas feathery, shorter than the anthers.

Common in fallows, specially in moist localities. A good fodder grass.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1268 Sohkha (Jaintia Hills); Deka 12662 Nongkhlaw (Khasi Hills).

Schizachyrium Nees

Annuals or perennials. Culms slender or branched. Leaves narrow, usually folded in buds. Inflorescence a spatheate, false panicle. Spikelets 2-nate, one sessile and the other pedicelled, on auriculate, fragile rhachis; joints and pedicels thickened upwards. Florets 2, lower florets empty and the upper hermaphro-

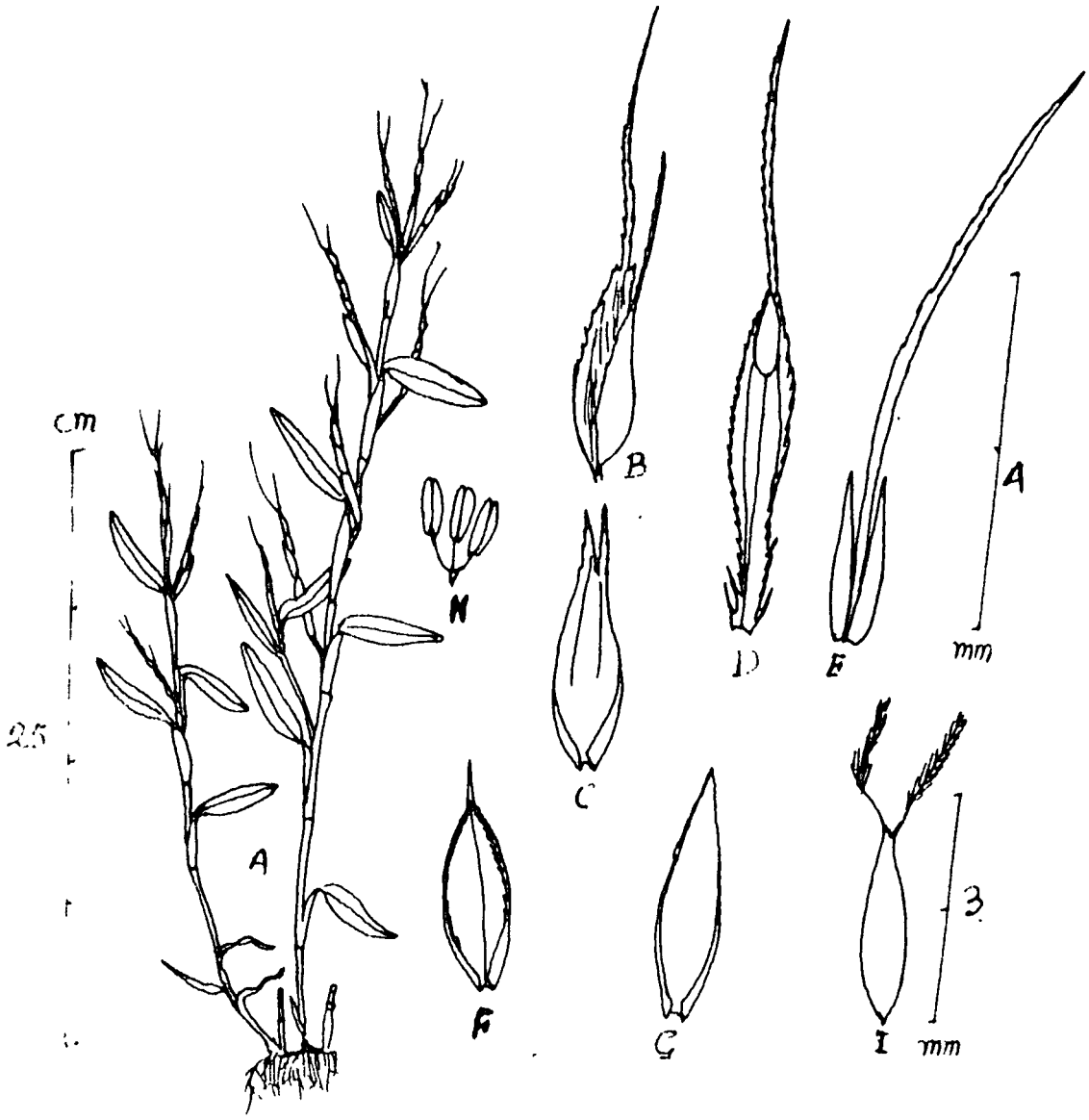


Plate 63 Schizachyrium brevifolium (S.W.) Nees ex Buse A.Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lower Lemma, F. Upper Lemma, G. Palea, H. Androecium, I. Gynoecium.

dite; sessile spikelets dorsally compressed, awned, callus short, bearded at the base. Glumes slightly equal, sharply inflexed, 2-keeled, 1-3-nerved. Lemmas ciliolate, 2-nerved, entire or 2-fid, awned. Palea 0. Lodicules 2. Stamens 2-3, Stigmas laterally exserted at the base of the spikelets. Caryopsis linear, terete.

K E Y T O S P E C I E S

1a. Annuals; culms very short, not more than 20 cm high; leaves linear, with rounded tip; awn less than 1.5 cm long. . . brevifolium

1b. Perennials; culms 50-90 cm high; leaves linear with acute apex; awn more than 1.5 cm long. . sanguineum

Schizachyrium brevifolium (Sw.) Nees ex Buse in Miquel. Pl. Junghn. 359. 1854; Bor in Fl. Assam 5: 398. 1940 et Grass. Burm. Ceyl. Ind. Pak. 215. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 375. 1966; Babu Herb. Fl. Dehra Dun 640. 1977. - - Andropogon brevifolius Sw. Prodr. Veg. Ind. Occ. 26. 1788; Hook.f. Fl. Brit. India 7: 165. 1896 (Plate 63).

Annuals. Culms erect, forming dense patches in pine forests, internodes short, glabrous. Leaves oblong, 1-3 x 0.1-0.4 cm, scabrid on the keels and margin, apex rounded or subobtuse. Ligule a short membrane with sparse hairs on the sides. Racemes simple or branched, 1-5 cm long, jointed, glabrous, hardly exserting out from the upper leaf-like bracts. Sessile spikelets

adnate to the rhachis, 2.5-3 mm long, lower glumes scabrid on the keels, 3-nerved, 2-toothed. Callus bearded; upper glumes hyaline, 1-nerved, scabrid near the apex, on the nerve, apex unequal. Pedicelled spikelets: pedicels flat, glume-like, with thread-like connectives; lemmas deeply lobed, with long awn in between the lobes. Palea hyaline, scabrid on margin. Stamens 3, anthers short, 0.5 mm long. Styles 2, longer than the plumose stigmas.

Common in pine forests, in dry, slopy areas.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1179 Shillong, 1241 Mawmluh (Khasi Hills).

Shizachyrium sanguineum (Retz.) Alst. Suppl. Fl. Ceyl. 334. 1931; Bor Grass. Burm. Ceyl. Ind. Pak. 216. 1960. - - Rottboellia sanguinea Retz. Obs. Bot. 3: 25. 1783 (Plate 64).

Tufted perennials. Culms fastegiate, branched up to 1 m high. Leaves radical, 5-10 x 0.5-1 cm, obtuse, glabrous, auricled, sheaths loose, shorter than the internodes, ligule an erose membrane. Racemes unequal, 10-20 cm long, from the spathaceous bracts, rhachis jointed. Spikelets longer than the joints, clavate, sessile spikelets adpressed to the joint, linear, acute, up to 8 mm long, arranged spirally; callus bearded; lower glumes stout, scabrid, infolded, as long as the spikelets, 6-nerved, apex 2-toothed; upper glumes broad, navicular, scabrid

Plate 64 Schizachyrium sanguineum (Retz.) Alst. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lower Lemma, F. Upper Lemma, G. Pistil.

on the keels, margin hirsute, with hyaline hairs, 1-nerved, apex aristate. Lemmas linear, purple, acute; upper lemmas deeply lobed, with long awn in between the lobes. Ovary linear, up to 4 mm long. Stamens long.

Frequent in dry exposed rocky areas.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1144 Shillong.

Setaria P. Beauv.

Annuals or perennials. Inflorescence a contracted or spreading panicle. Spikelets 2-5 together, subtended by 1-many bristles; lower florets male or barren; upper florets hermaphrodite. Glumes unequal, membranous, 3-5-(rarely 7-) nerved; palea equal to the lemma; lemmas of the upper floret crustaceous, finely pitted or transversely rugose. Lodicules 2. Stamens 3. Stigmas terminally exserted. Caryopsis ellipsoid.

K E Y T O S P E C I E S

1a. Leaves plicate; inflorescence not a spiciform panicle . . . . . palmifolia

1b. Leaves not plicate; inflorescence a cylindric, spiciform panicle.

2a. Upper glumes as long as the upper lemma; upper lemmas glabrous or minutely rugulose; spikelets persistent . . . . italica

2b. Upper glumes shorter than the upper lemma; the latter always hairy or rugulose.

3a. Spikelets 3 mm long; upper lemmas coarsely rugose, cymbiform, keeled . . . . . glauca

3b. Spikelets less than 3 mm long; upper lemmas finely rugolose; narrow, not keeled. . . pallide-fusca

Setaria glauca (Linn.) P. Beauv. Ess. Agrost. 51: 169, 178. 1812; Hook.f. Fl. Brit. India 7: 78. 1896; Bor in Fl. Assam 5: 290. 1940 et Grass. Burm. Ceyl. Ind. Pak. 360. 1960; Babu Herb. Fl. Dehra Dun 641. 1977. - - Panicum glaucum Linn. Sp. Pl. 56. 1753.

Annuals. Culms loosely tufted from the geniculate base, glabrous, hairy only below the panicle. Leaves flat, hairy, or glabrous, tapering to an apex, ciliate at base, blades 5-30 x 0.5-1 cm, sheaths membranous, glabrous or ciliate. Ligule a rim of cilia. Inflorescence an erect, cylindric spike, 2-10 x 0.5-0.8 cm, branches reduced to sessile involucre with 10 bristles at the base of the perfect spikelets, spikelets 3 mm long. Lower glumes 1 mm long, acute, 3-5-nerved; upper glumes 1.2 mm long, 5-nerved; lower lemma equal to the spikelets infolded, 5-7-nerved; upper lemma similar to lower one but thicker, rugose, nerveless. Palea hyaline, flat. Stamens 3, anthers 1 mm long. Styles 2, stigmas feathery. Lower floret empty or sometimes male.

Abundant on all types of soils specially in fallows. A good fodder grass.

Fls. & Frts. : July to February.

Specimens examined: Myrthong 1039, 1110 Shillong.

Setaria italica (Linn.) P. Beauv. Ess. Agrost. 51: 178. 1812; Hook.f. Fl. Brit. India 7: 78. 1896; Bor in Fl. Assam 5: 286. 1940 et Grass. Burm. Ceyl. Indi Pak. 362. 1960; Babu Herb. Fl. Dehra Dun 642. 1977.- - Panicum italicum Linn. Sp. Pl. 56. 1753;.- - Pennisetum italicum (Linn.) R. Br. Prodr. 1: 195. 1810;- - Setaria germanica (Willd.) P. Beauv. Ess. Agrost, 51: 178. 1812.

Vern.-' Raishan' (K).

Annuals. Culms erect or geniculate, jointed, glabrous, scabrid only below the panicle, up to 1 m high. Leaves 15-40 x 0.5-1 cm, striate, scabrid on the nerves of the upper surface, tapering to a setaceous apex, sheaths glabrous, striate, margin villous. Ligule short, ciliate. Spikes erect, cylindric. Spikelets arranged compactly. Pedicels 1-1.5 mm long, rough. Spikelets ovate, 2-3 mm long, acute. Lower glumes ovate, acute, 1-3-nerved, 1 mm long; upper glumes ovate, 2 mm long, acute, 5-7-nerved. Lower florets barren; lemma similar to the upper glume, 5-nerved; palea minute or absent. Upper florets hermaphrodite; lemma as long as spikelets, reddish at maturity, crustaceous, glabrous. Palea similar to lemma. Caryopsis globose to ellipsoid, 2-2.5 mm long,

Cultivated for the grains.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1748 Burnihat (Khasi Hills); 1950 Tura (Garo Hills).

Setaria pallide-fusca (Schumach.) Stapf et Hubb. in Kew Bull. 1930: 259. 1930; Bor in Fl. Assam 5: 291. 1940 et Grass. Burm. Ceyl. Ind. Pak. 363. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 376. 1966; Babu Herb. Fl. Dehra Dun 643, 1977. - - Panicum pallide-fuscum Schumach. Beskr. Guin. Pl. 58. 1827.

Annuals. Culms erect or geniculate at base, tufted or solitary, glabrous, 20-50 cm high, Leaves linear, tapering to a setaceous apex, glabrous or with few hairs near the base, blades 5-20 x 0.2-0.8 cm, sheaths loose, margin membranous. Ligule truncate, ciliate. Spikes cylindric, with fuscous bristles all over. Spikelets sessile, condensed on the axis, involucral spikelets with reduced, companion spikelets and with 8 long bristles. Lower glumes ovate, acute, 3-5-nerved; upper glumes similar to lower ones. Lower florets barren or male; lemma membranous, 5-nerved; palea as long as lemma, with transverse wavy strands, nerveless. Lodicules 2, hyaline, flat, nerveless. Stamens 3. Upper florets hermaphrodite cymbiform; lemmas crustaceous, transversely rugose; palea granular, stamens 3. Styles 2, caryopsis elliptic, plano-convex.

Frequent in abandoned cultivated lands.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1673 Umling (Khasi Hills).

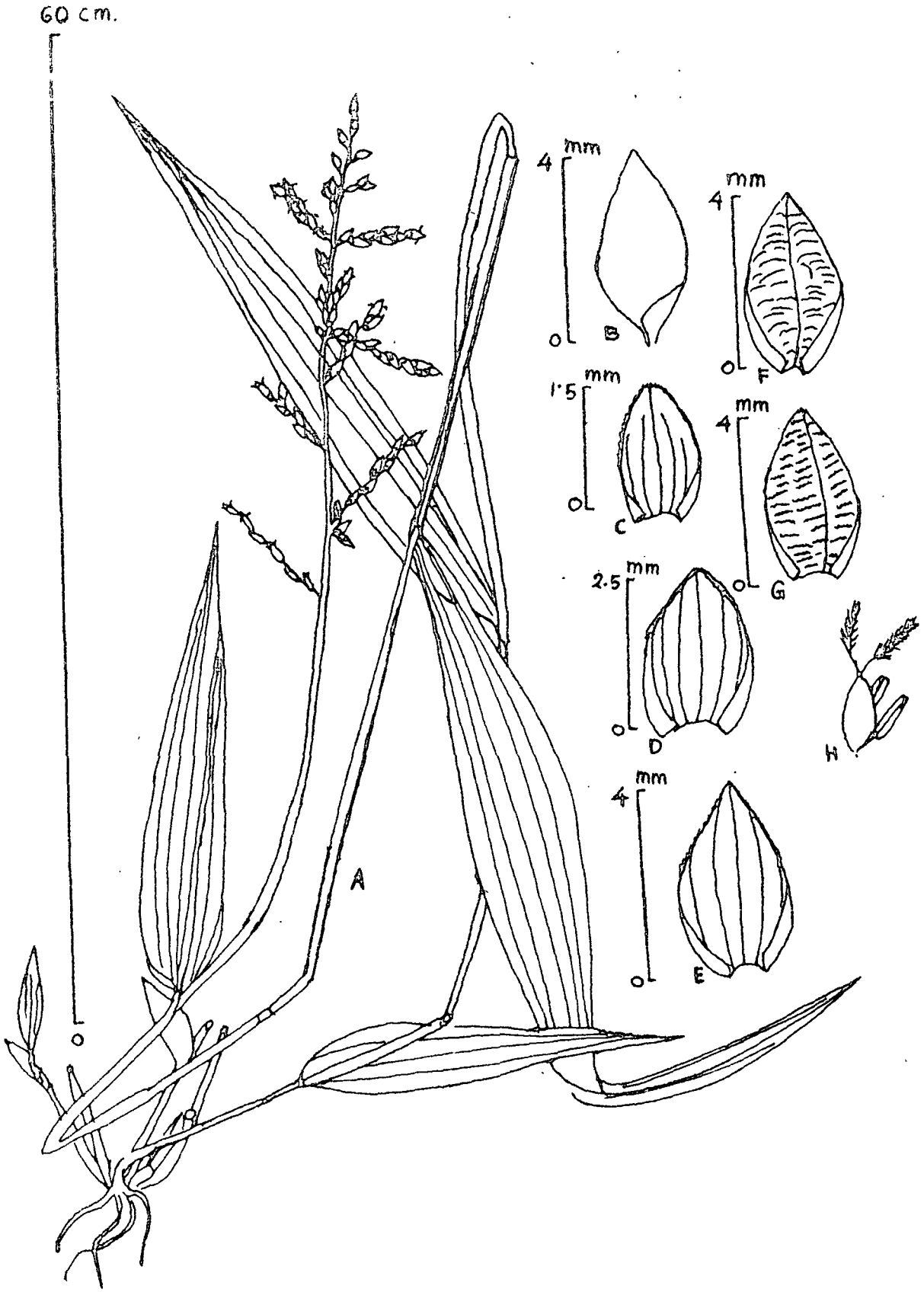


Plate 65 Setaria palmifolia (Koen.) Stapf A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. 1st Palea, G. 2nd Palea, H. Pistil with Androecium.

Setaria palmifolia (Koen.) Stapf in Journ. Linn. Soc. Bot. 42: 186. 1914; Bor in Fl. Assam 5: 284. 1940 et Grass. Burm. Ceyl. Ind. Pak. 363. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 376. 1966; Babu Herb. Fl. Dehra Dun 643. 1977. - - Panicum palaefolium Koen. in Naturf. 23: 208. 1788; - - P. plicatum Willd. Enum. Pl. 1033. 1809 non Lamk. 1791. (Plate 65).

Perennials. Culms stout, 50-100 cm high, geniculate, rooting from the base, glabrous. Leaves plicate, ovate-lanceolate, 15-50 x 1-8 cm, many-nerved, hairy or glabrous, margin scabrid, base narrow, petiole-like, apex acuminate, sheaths loose, membranous, glabrous or ciliate. Ligule a ciliate membrane. Panicles 10-50 cm long. Spikes alternate or spirally arranged, 2-15 cm long, axis angular, scabrid on the angles. Spikelets subtended by a single bristle, 3 mm long, shortly pedicelled. Lower glumes ovate, oblong, 3-5-nerved, upper glumes broadly ovate, acute, 5-7-nerved. Lower florets barren; lemma similar to the upper glume, 5-nerved. Upper florets hermaphrodite, lemma crustaceous, shortly apiculate, margin involute; palea ovate, acute, equalling the lemma. Stamens 3, anthers 2 mm long. Styles shorter than the anthers, stigmas feathery.

In all types of forests. Specimens in marshy, shady places are robust.

Fls. & Frts. : January to December.

Specimens examined: Myrthong 1030, 1158 Shillong.

Sorghum Moench

Annuals or perennial, tall grasses with flat, large leaves. Panicles erect or nodding with verticillate or scattered branches. Spikelets 2-3-nate, one sessile and the other pedicelled or represented by a pedicel only, 2-flowered, the sessile reduced to an empty lemma and the upper hermaphrodite. Glumes equal, coriaceous, muticous; upper glumes borad, with convex back, narrowly inflexed near the tip. Lemmas ciliate, hyaline, 2-nerved; lower entire or truncate and the upper 2-lobed, awned or mucronate, 1-3-nerved. Palea absent or if present very minute. Lodicules 2. Stamens 3. Stigmas exserted laterally. Caryopsis obovoid.

K E Y T O S P E C I E S

1a. Robust plants; panicles thick, with crowded spikelets; branches not verticillate; sessile spikelets broadly obovate to subglobose . . . . . *bicolor* var. *subglobosum*

1b. Slender plants; panicles thin; sp. spikelets sparsely arranged; branches verticillate; sessile spikelets elliptic-oblong . . . . . *nitidum*

Sorghum bicolor var. *subglobosum* (Hack.) Snowden in Kew Bull. 1935: 237. 1935; Bar Grass. Burm. Ceyl. Ind. Pak. 228. 1960. - - *Andropogon sorghum* subsp. *sativus* var. *subglobosus* Hack. in DC. Monogr. Phan. 6: 515. 1889.

Annuals. Culms erect, rootstock, well developed, tall up to 2 x 1-2 cm, glabrous. Leaves linear, drooping, 30-60 x

2-5 cm, midrib prominent, glabrous, scabrid on margin, undulated, sheaths loose, thin, membranous. Ligule an archy membrane, with short hairs all over. Panicles globose, 10-30 x 5-10 cm, branched, spikelets dense, both sessile and pedicelled; the sessile spikelets 3.5-4.3 mm long, subglobose, or ovate; lower glumes 4 mm long, ovate, truncate, many-nerved, scaberulous on the upper portion, infolded; upper glumes similar to the lower ones, but smaller, strongly infolded. Lower florets male or barren; lemma hyaline, 2-lobed with very dissected margins, winged, awned. Palea 2, short, stout, truncate, bearded. Upper florets hermaphrodite: lemma similar to that of lower florets, margin wavy, with flexuous, fleshy hairs, awnless. Stamens 3, anthers sagittate. Styles 2, stigmas feathery. Caryopsis shining, punctate.

Cultivated for its grains.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3001 Tasak (Garo Hills).

Sorghum nitidum (Vahl.) Pers. Syn. Pl. 1: 101. 1895; Bor in Fl. Assam 5: 351. 1940 et Grass. Burm. Ceyl. Ind. Pak. 245. 1960; Babu Herb. Fl. Dehra Dun 646. 1977. - - Holcus nitidus Vahl. Symb. Bot. 2: 102. 1805. - - Andropogon serratus Thunb. Fl. Jap. 41. 1784; Hook.f. Fl. Brit. India 7: 185. 1896.

Annuals, reed-like. Culms 1-1.5 m high, bearded at the nodes. Leaves 30-50 x 0.5-0.8 cm, margin very scabrid, auricled, sheaths glabrous. Ligule long, setaceous, membranous. Panicles

verticillate, branches whorled. Spikelets in pairs. One sessile and the other pedicelled. Spikelets ovate-lanceolate, brown or blackish brown, 4.5-5 mm long, callus hairy. Lower glumes as long as the spikelets, obscurely nerved, dorsal surface dark brown, hairy; upper glumes as long as lower, but smaller, shining, glabrous, hairy only towards the apex and on the margin, deep brown. Lower florets barren; lemmas hyaline, margin infolded, clasping the base of spikelets, ciliate. Upper florets hermaphrodite; lemma ovate, 2 mm long, ciliate in the upper half, with transverse line in the middle. Stamens 3. Styles 2, stigmas feathery flexuous.

Common in grasslands, associated with tall grasses.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3168 Garumpani (Jaintia Hills).

Sphaerocaryum Nees ex Hook.f.

Sphaerocaryum malaccense (Trin.) Pilger in Fedde Rep. Sp. Nov. 45: 2. 1938; Bor in Fl. Assam 5: 156. 1940 et Grass. Burm. Ceyl. Ind. Pak. 583. 1960; - - Panicum malaccense Trin. In Gram. Panic. 204. 1826. - - Sphaerocaryum elegans Nees ex Steud. Nom. Bot. ed. 2, 2: 620. 1841; Hook.f. Fl. Brit. India 7: 246. 1896 (Plate 66).

Annuals. Culms prostrate or decumbent, rooting at the lower nodes, hairy at the nodes, 10-50 cm high. Leaves ovate, acute or subacute, amplexicual, striate, margin serrate or dentate,

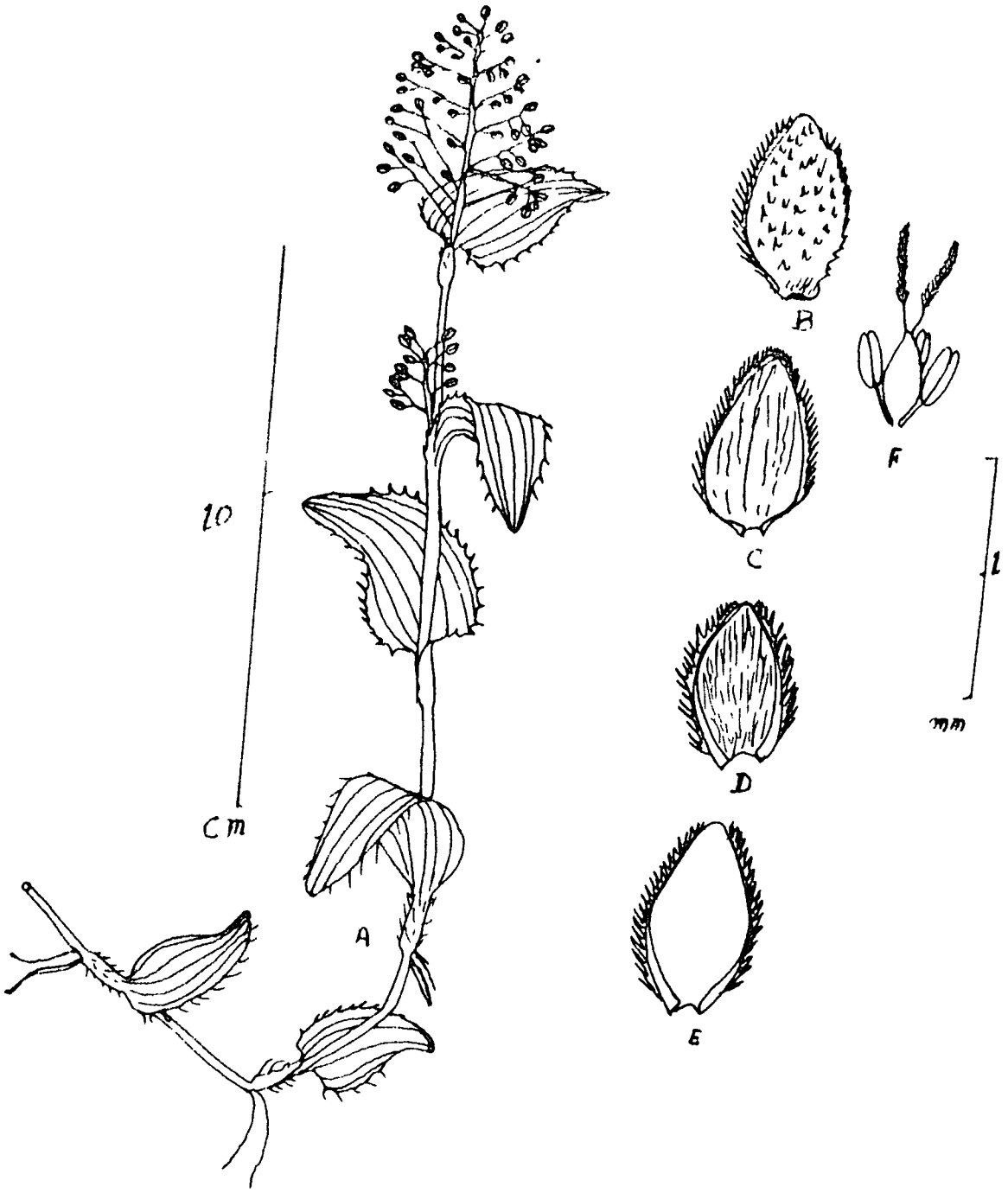


Plate 66 Sphaerocaryum malaccense (Trin.) Pilger A. Portion of stem, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Androecium & Gynoecium.

sheaths tight, very hirsute, shorter than the internodes; ligule a ring of white stiff cilia. Panicle spreading, ovate, 3-4 mm long. Branches shorter gradually towards the apex. Spikelets sparse, ovoid, pinkish green, 1-2 mm long. Lower glumes cymbiform, obtuse, nerveless; upper glumes similar to the lower ones, but with indistinct nerves. Lemmas ovate, obtuse, nerves indistinct, hairy at the back. Palea linear-lanceolate, acuminate, hirsute. Lodicules 2, hyaline. Stamens 3, anthers very short. Styles 2, stigmas flat, plumose. Caryopsis ovoid, lanceolate.

Common in stagnant waters, in drains, ditches, etc.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1139 Shillong, 1233 Mawsmai (Khasi Hills); 1424 Tura (Garo Hills).

Sporobolus R. Br.

Perennials, rarely annuals. Culms slender, erect or arching at anthesis. Leaves linear, flat or convolute. Inflorescence an effuse or contracted, spiciform panicle. Spiekelets 1, rarely 2-flowered; rhachilla short, not produced above the lemma. Glumes unequal, persistent, lower glumes nerveless and the upper glume 1-nerved. Lemma more or less equalling the upper glume, 1-nerved or obscurely 3-nerved. Palea equalling the lemma, 2-nerved. Lodicules 2. Stamens 3, rarely 2. Stigmas laterally exserted above the middle of the spikelet. Caryopsis elliptic, free.

K E Y T O S P E C I E S

1a. Spikes up to 10 cm long, erect, subcylindric, branches very short or absent; seeds elliptic . . pilliferus

1b. Spikes over 10 cm long, suberect or arching, spreading or if not spreading with long racemes or branches; seeds truncate.

2a. Racemes few, spreading along the axis; seeds much less than 1 mm . . . . . diander

2b. Racemes numerous, contracted along the axis; seeds about 1 mm long . . . . . indicus

Sporobolus diander (Retz.) P. Beauv. Ess. Agrost. 26: 147. 178. 1812; Hook.f. Fl. Brit. India 7: 247. 1896; Bor in Fl. Assam 5: 117. 1940 et Grass. Burm. Ceyl. Ind. Pak. 629. 1960; Chieh-chang Hsu in Hara Fl. East. Himal. 377. 1966; Babu Herb. Fl. Dehra Dun 647. 1977. - - Agrostis diandra Retz. Obs. Bot. 5: 19. 1789.

Perennials. Culms tufted, or solitary, erect, or geniculate at base, glabrous. Leaves linear, 8-20 x 0.2-0.5 cm, convolute, glabrous, sheaths striate, glabrous. Ligule hairy. Panicle pyramidal, branches horizontally placed or suberect. Spikelets 1.3 mm long, lower glumes, ovate, erose, nerveless; upper glumes 1 mm long, linear, erose, nerveless. Lemmas 1.5 mm long, obscurely 1-nerved. Palea equalling the lemma, 2-unequal lobed at the apex. Stamens 2-3, anthers short. Styles 2,

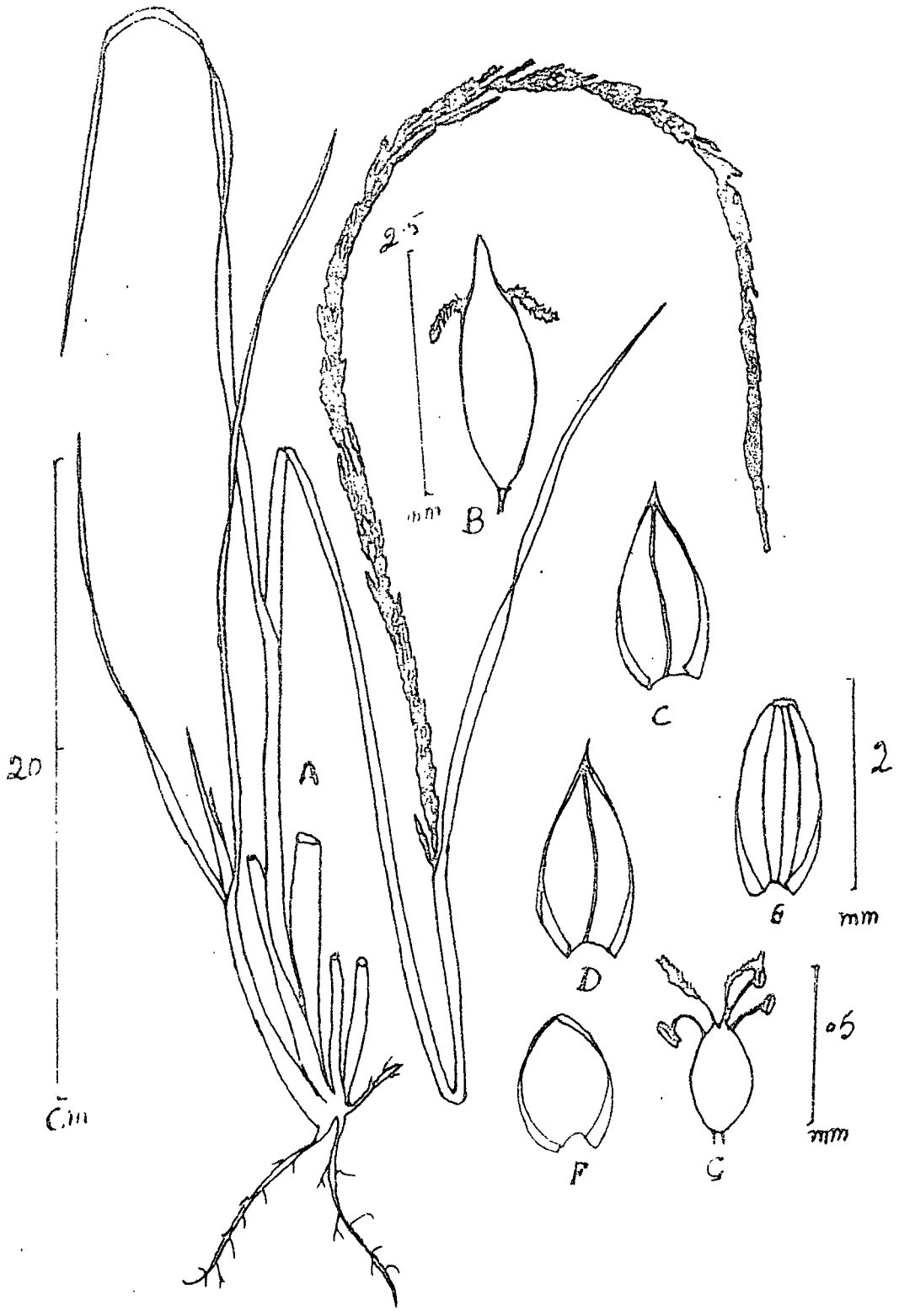


Plate 67 Sporobolus indicus auct Non (Linn.) R. Br. A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Pistil & Stamens.

stigmas feathery. Caryopsis truncate.

Common in open areas, and on the banks of streams, etc. in lower elevations.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1100 Barapani, 1376 Lailad (Khasi Hills); 1402 Baghmara, 1473 Tura (Garo Hills).

Sporobolus indicus auct non (Linn.) R. Br. Prodr. 170. 1810; Hook.f. Fl. Brit. India 7: 247. 1896; Bor in Fl. Assam 5: 117. 1940 et Grass. Burm. Ceyl. Ind. Pak. 630. 1960(Plate 67).

Perennials. Culms tufted, 30-120 cm high, erect or geniculate from base, glabrous. Leaves linear, filiform, as long as the culms or shorter, involute, scabrid on the nerves, margin scabrid, sheaths striate, glabrous, shorter than the internodes, margin hyaline, glabrous. Ligule hairy. Panicle terminal, erect or archy, 15-60 cm long. Branches 1-2 cm long, spikelets crowded, 1-2 mm long, linear-lanceolate. Lower glumes very short, nerveless, erose; upper glumes similar to lower, erose. Lemmas as long as spikelets, linear, 1-nerved. Palea as long as, or shorter than the lemma, incurved. Stamens 2. Styles 2, stigmas densely plumose. Caryopsis elongated.

Common on embankment of the paddy fields, and along the banks of streams, rivers, etc.

Fls. & Frts. : October to December.

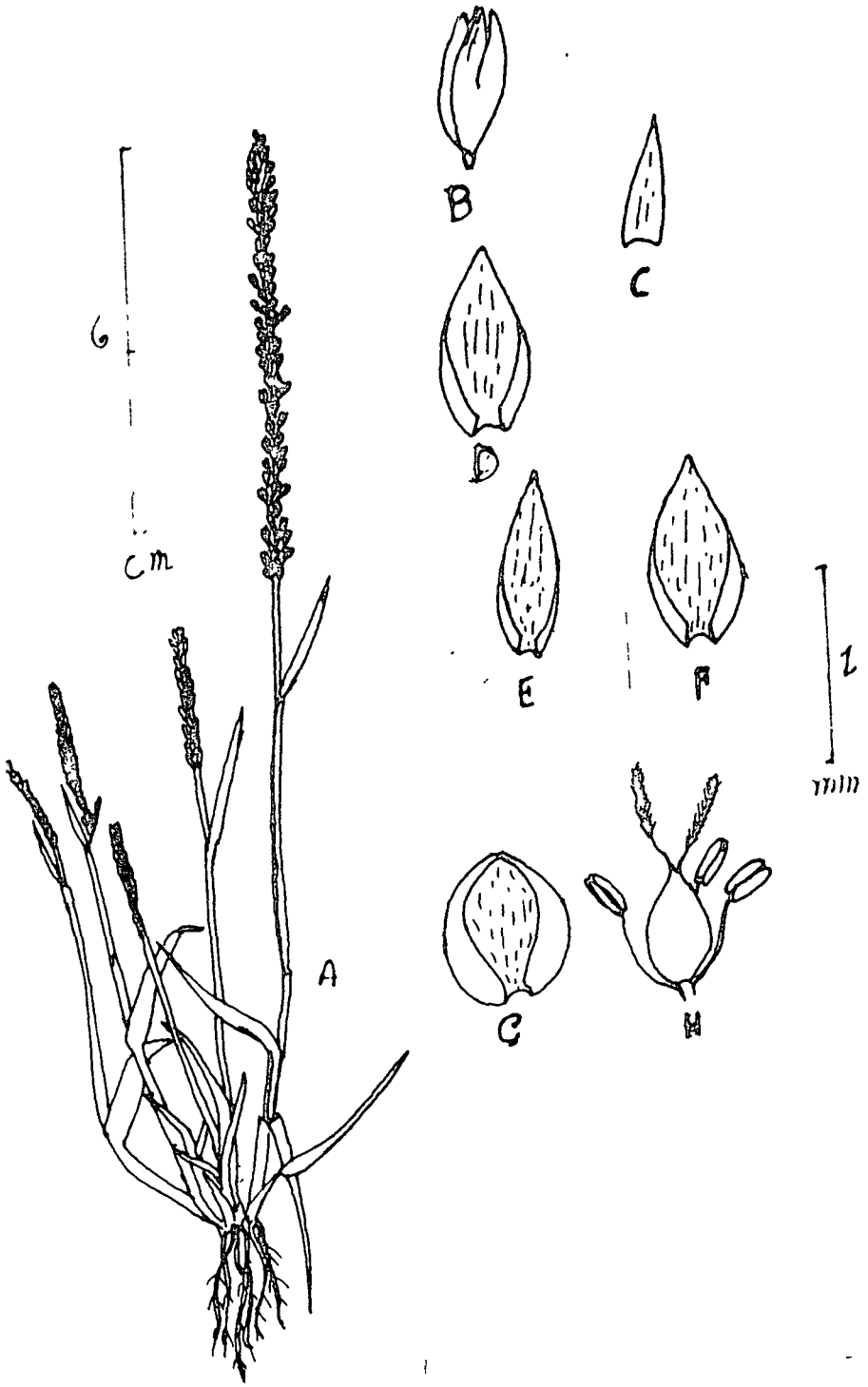


Plate 63 Sporobolus piliferus Kunth, A. Habit, B. Spikelet, C. Lower Glume, D. Upper Glume, E. Lemma, F. Palea, G. Lodicule, H. Androecium & Gynoecium.

Specimens examined: Myrthong 1004, 1341 Shillong (Khasi Hills); 1479 Garumpani, 1596 Jowai (Jaintia Hills); 1276 Baghmara, 1837 Agarobadha (Garo Hills).

Sporobolus piliferus Kunth Enum. Pl. 1: 211. 1833; Hook.f. Fl. Brit. India 7: 251. 1896; Bor in Fl. Assam 5: 119. 1940 et Grass. Burm. Ceyl. Ind. Pak. 632. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 377. 1966 (Plate 68).

Annuals. Culms erect, or geniculate from base, tufted, 5-30 cm high, glabrous. Leaves flat, sometimes convolute, erect, hairy, margin scaberulous, sheaths sparsely hairy, shorter than the internodes. Ligule a ring of cilia. Inflorescence a dense interrupted, cylindric panicle, 2-10 cm long. Spikelets paired; one sessile or subsessile and other with longer pedicel. Spikelets 1.5 mm long, linear, lower glumes 0.5 mm long, nerveless, 2-3-lobed; upper glumes 1.5 mm long, obscurely 1-nerved; lemmas longer than the upper glume, lanceolate, obscurely 1-nerved. Palea similar to lemma. Stamens 2. Styles 2, stigmas filiform, sparsely feathery.

Abundant in the hills, in abandoned cultivated lands, and in grassy localities.

Fls. & Frts. : August to March.

Specimens examined: Myrthong 1053 Shillong, 1838 Markasa (Khasi Hills).

Themeda Forssk.

Tall, annual or perennial grasses with long, narrow leaves. Racemes terminal. Spikelets embraced by the spathaceous bracts, paired, both of the lower pairs similar either male or sterile, awnless; sessile spikelets forming an involucre, spikelets of the following pairs differ in sex and size, one sessile and the other pedicelled. Florets 2. Lower reduced to an empty lemma; upper male or neuter in the homogamous pairs. Fertile spikelets awned or awnless; callus densely bearded. Glumes equal, lower tightly involute, finely nerved; upper basal glume deeply channelled; lower lemma nerveless; upper also nerveless. Lemma hard, stipe-like, ending in a short awn. Palea hyaline, nerveless, small or absent. Lodicules 2, glabrous. Stamens 3. Stigmas subterminally exserted. Caryopsis linear, obovate, subterete.

K E Y T O S P E C I E S

1a. Plants 1-2 m high; pairs of involucral spikelets inserted at the same level; racemes in dense congested heads; sessile spikelets awned . . . . . triandra

1b. Plants 2-5 m high; pairs of involucral spikelets inserted at different levels; racemes in spreading panicles.

2a. Involucral spikelets entirely glabrous or puberulous but without tubercle-based hairs.

3a. Fertile spikelets with an imperfect awn or awnless . . . . . villosa

3b. Fertile spikelets with a well developed awn . . . . . caudata

2b. Involucral spikelets covered on the lower glumes with numerous or few tubercle-based hairs . . . . intermedia

Themeda caudata (Nees))A. Camus in Lecomte Fl. Gen. Indo-chine 7: 364. 1922; Bor in Fl. Assam 5: 410. 1940 et Grass. Burm. Ceyl. Ind. Pak. 250. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 378. 1966; Babu Herb. Fl. Dehra Dun 649. 1977. - - Anthistiria caudata Nees in Hook. et Arn Bot. Beechey Voy. 245. 1838. - - Themeda gigantea Hack. subsp. caudata (Nees) Hack. in DC. Monogr. Phan. 6: 676. 1889; Hook.f. Fl. Brit. India 7: 217. 1896.

Vern.-'Traw-tidie' (K).

Perennials; tufted reed-like grasses, erect or geniculate; rootstock densely interlaced. Culms 5 m high, slightly compressed, glabrous. Leaves radical, up to 2 m long, with prominent midrib. scabrid, margin very rough, sheaths glabrous; ligule a ring of cilia. Inflorescence a compound panicle, exserted out from the spathe-like leaves, Involucral spikelets 4-6; sessile spikelets 6-8 mm long, ovate lanceolate, densely bearded and with 5 cm long awn; callus ciliate. Lower glumes coriaceous, aristate, margin infolded, 9-nerved; upper glumes shorter than the lower ones, 3-nerved, scabrid. Lemmas similar, hyaline. Lower florets empty. Upper florets hermaphrodite; lemma hyaline. Lodicules oblong-lanceolate. Stamens 3, anthers 5-6 mm long. Caryopsis oblong, brown.

Frequent in forests and jhums. Culms and leaves are used for thatching huts.

Fls. & Frts. : October to February.

Specimens examined: Myrthong 1078 Shillong.

Themeda intermedia (Hack.) Bor in Ind. For. Rec. Bot. 1: 3, 96. 1938; in Fl. Assam 5: 414. 1940 et Grass. Burm. Ceyl. Ind. Pak. 251. 1960. - - T. gigantea subsp. intermedia var. intermedia Hack. in DC. Monogr. Phan. 6: 675. 1889.

Vern.-'Raw-tdie' (K).

Perennials , stout tufted grasses. Culms erect, densely leafy at the base, glabrous 3 m high. Leaves linear, scabrid, margin very scaberulous, blades up to 1 m long or more, sheaths striate, glabrous auricled at the mouth, keeled, membranous. Ligule a membranous ring. Panicle decompound up to 50 cm long, drooping at maturity; spathe-like bracts cymbiform, 3.5 cm long, scabrid on the keels, with setaceous tip. Involucral spikelets 4-8, sessile spikelets short, 7-8 mm long, truncate, covered with dense brown hairs all over; callus with tuft of hairs. Lower glumes as long as the spikelets, truncate, with inflexed margin, hairy all over; upper glumes linear, 3-nerved, 6-7 mm long, flat tip obtuse, ciliate. Lemma oblong-lanceolate, 1-nerved, ciliate, at the apex, 6 mm long. Lodicules 1-nerved, hyaline, ciliate at the apex. Stamens 3, anther long, up to 8 mm long. Caryopsis oblong-obovate, punctate.

In forest margins and fallows;often a weed of gardens and in fences. The culms and leaves are used for thatching purposes.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1224 Mawmluh (Khasi Hills); 1437 Baghmara (Garo Hills).

Themeda triandra Forssk. Fl. Aegypt.-Arab. 178. 1775; Bor in Fl. Assam 5: 406. 1940 et Grass. Burm. Ceyl. Ind. Pak. 254. 1960.

Perennials or annuals. Culms erect or geniculate at base, 0.5- 2 m high, glabrous. Leaves linear, scabrid on the nerves, midrib prominent, 15-30 x 0.5-0.3 cm; upper leaves spathiform, sheaths loose, margin villous; ligule membranous, vaginate, ciliate at the back. Panicle leafy nodding at the top, rhachis capillary, glabrous. Involucral spikelets sessile, 8-12 mm long, acute, hairy; callus glabrous 1 mm long. Lower glumes 6-8 mm long, many-nerved; keels scabrid with few long tubercle-based hairs, acute; upper glumes lenaceolate, keels scabrid, from the upper half, acute with broad tubercle-based hairs near the margin. Lower florets empty, lemma oblong, acute, nerveless. Upper florets hermaphrodite, lemma oblong, acute 1-3-nerved. Stamens 3, anther subulate 5 mm long. Styles 2. Pedicelled s spikelets similar to involucral spikelets, acute. Sessile spikelets also hermaphrodite; lemma oblong, with long twisted awn, 5-6 cm long.

Common in grasslands and in forest clearing.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1328 Shillong (Khasi Hills); 1882 Sohkha, 1482 Garumpani (Jaintia Hills).

Themeda villosa (Poir.) A. Camus in Lecomte Fl. Gen. Indo-chine 7: 364. 1922; Bor in Fl. Assam 5: 407. 1940 et Grass. Burm. Ceyl. Ind. Pak. 254. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 378. 1966; Babu Herb. Fl. Dehra Dun 650. 1977. - - Anthisteria villosa Poir. in Lamk. Encucl. Meth. Bot. Suppl. 1: 396. 1814. Androscepia mutica Anderss. ex Hook.f. Fl. Brit. India 7: 217. 1896.

Vern.-'Raw-tdie' (K).

Perennials. Culms tufted, 1-2 m high, compressed,below, glabrous. Leaves linear, rough on both surfaces, midrib prominent, margin scabrid, blades 50-1.5 m x 5-8 mm, convolute when dry, sheaths striate, spathe-like, keels gabrous; ligule a fringe of hairs. Panicle large, leafy, decompound, exserted from the bract-like leaves, spathes 2-4 cm long, cymbiform, tapering to a setaceous apex. Involucral spikelets in pairs. Lower glumes many-nerved; upper glumes shorter than the lower one, hyaline, 3-nerved, obtuse; lemma hyaline, 1-nerved. Palea hyaline, nerveless. Stamens 3, anther very short. Central spikelets sessile, stout, 7-8 mm long, covered with brown itching hairs; callus ciliate. Lower glumes 8 mm long, margin inflexed, nerves

indistinct, brown, hairy; upper glumes oblong, 7 mm long, shorter than the lower, pedicelled spikelets. Lower floret empty. Upper florets hermaphrodite; lemma lanceolate, 6 mm long, with 7-8 mm long awn. Pedicelled spikelets male; stamens 3, anthers 4-5 mm long.

A weed of gardens and fallows. Culms and leaves used for thatching and plaiting the walls.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1472 Tura (Garo Hills); 1480 Garumpani (Jaintia Hills).

Thyrsia Stapf

Thyrsia zea (Cl.) Stapf in Hook.Icon. Pl. 1922; Bor in Fl. Assam 5: 437. 1940 et Grass. Burm. Ceyl. Ind. Pak. 255. 1960. - Rottboellia zea Cl. in Journ. Linn. Soc. Bot. 25: 86. t. 35. 1889; Hook.f. Fl. Brit. India 7: 152. 1896.

Reed-like grasses. Culms tall, up to 3 m high, glabrous. Leaves 50-80 cm long, hairy at the base, margin scabrid, sheaths loose, ciliate on margin. Ligule membranous, truncate. Inflorescence a thyrsiform panicle, racemes developing at the axils of leaves, on the terminal part of the culms, subverticillate, axis jointed, very fragile. Spikelets pedicelled, 4-7 mm long, linear. Lower glumes thick, spathulate, 2-nerved, keeled, scaberulous, 4 mm long; upper glumes broad, compressed with 1-strong median nerve. Sessile spikelets longer than the pedicelled ones. Lower florets empty, linear, lemma hyaline, 2-nerved. Upper

florets hermaphrodite; lemma hyaline, 2-nerved. Palea acute, obscurely 2-nerved. Stamens 3, anther linear, acute. Stigmas 2, wiry, feathery.

Frequent in lower elevations.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1282 Sohkha (Jaintia Hills).

Thysanolaena Nees

Thysanolaena maxima (Roxb.) Kuntze Rev. Gen. Pl. 2: 794. 1891; Bor in Fl. Assam 5: 176. 1940 et Grass. Burm. Ceyl. Ind. Pak. 650. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 378. 1966; Babu Herb. Fl. Dehra Dun 650. 1977. - - Agrostis maxima Roxb. Fl. Ind. 1: 319. 1820; - - Thysanolaena agrostis Nees in Edinb. New. Phil. Journ. 18: 180. 1835; Hook.f. Fl. Brit. India 7: 61. 1896.

Vern.- 'Synsar' (K); 'Tynsur'(K);'Ongpat'(K)

Perennials. Culms tufted, 1-3 m high, glabrous with dry leafsheaths in the lower nodes. Leaves broadly lanceolate, acute, 20-50 x 2-10 cm, glaucous, margin scabrid, sheaths close, glabrous; ligule membranous, 2 mm long, truncate. Panicles dense, branches and branchlets numerous, axis angled, glabrous, jointed, rhachilla filiform. Spikelets numerous, in pairs, or solitary, 1-2 mm long, with stellate hairs. Lower glumes about 1 mm long, cuneate, hyaline, 1-nerved; upper glumes similar to lower ones. Lower florets empty; lemma lanceolate, acute,

1-nerved. Upper florets hermaphrodite; lemma ovate, lanceolate, acute. Palea hyaline, truncate. Stamens 3. Styles 2, stigmas revolute.

Gregarious in forest clearings and along road cuttings. Culms along with inflorescences extensively used as brooms.

Fls. & Frts. : September to March.

Specimens examined: Myrthong 1609 Jowai (Jaintia Hills); 1198 Shillong (Khasi Hills);

Tripogon R. & S.

Annuals or perennials. Culms slender, tufted. Leaves linear, convolute. Spikelets usually many-flowered, 2-seriate and unilateral, on terminal, slender spikes; rhachilla jointed at base and continued above; glumes unequal, 1-nerved; lemmas 2-fid, awned on the cleft or rarely 4-fid with outer lobes awned. Palea broad, complicate, ciliate, keeled. Lodicules 2. Stamens 3. Stigmas short, laterally exserted. Caryopsis free, narrow.

K E Y T O S P E C I E S

1a. Lemmas cleft at the apex, awned in the cleft . . . . . trifidus

1b. Lemmas cleft at the apex into 4-lobes or with a definite lobe between each lateral awn and the median . . .filiformis

Tripogon filiformis Nees ex Steud. Syn. Pl. Glum. 1: 301. 1854; Hook.f. Fl. Brit. India 7: 288. 1896; Bor in Fl. Assam 5: 114. 1940 et Grass. Burm. Ceyl. Ind. Pak. 521. 1960; Babu Herb. Fl. Dehra Dun 651. 1977.

Culms tufted, glabrous, leafy at the base, 50 cm high. Leaves filiform, 5-15 x 0.2-0.3 cm, involute, scabrid towards the setaceous tip. Ligule a short membrane. Spikes linear, rhachis glabrous, angled, slightly compressed. Spikelets secund, laterally compressed, many-flowered. Lower glumes linear, with erose margin on one side, 1-nerved, 2 mm long, shortly aristate, keels scabrid, up to the tip; upper glumes ovate-oblong, 2.5-3 mm long, with 1 stout median nerve, apex 2-lobed, awn scabrid. Lemma broad, hyaline, 3-nerved, nerves extending into awns, median awn longer; callus bearded. Palea oblong, lanceolate, 2-marginal nerved, apex rounded. Stamens 3, anthers short, 1-1.5 mm long. Styles 2, short, stigmas plumose.

Common on road sides, in dry sandy soils and on soil deposited rocks or rock crevices.

Fls. & Frts. : September to January.

Specimens examined : Myrthong 1072, 1122 Shillong (Khasi Hills).

Tripogon trifidus Munro ex Stapf in Kew Bull. 1892: 85. 1892; Hook.f. Fl. Brit. India 7: 286. 1896; Bor in Fl. Assam 5: 113. 1940 et Grass. Burm. Ceyl. Ind. Pak. 524. 1960; Chien-Chang Hsu in Hara Fl. East. Himal. 378. 1966.

Plate 39 Tripogon trifidus Munro ex Stapf A.Habit, B.Lower Glume, C.Upper Glume, D.Lemma, E.Pistil with Stamens.

Culms tufted, 30-80 cm high, glabrous, covered with dead leafsheaths at the base. Leaves 10-15 x 0.2-0.5 cm, striate, scabrid on the keels. Ligule a ring of sparse hairs. Spikes short, rhachis compressed, glabrous, channelled. Spikelets distant, linear, acute with many-flowered. Lower glumes short, with large lobes on one side near the base, 1-nerved; upper glume 1-nerved, 2-fid. Lemma bearded at base, broad, 3-nerved, median nerve prolonging into a long scabrid awn, twice as long as the lemma or equal to the lemma. Lemmas of the upper floret with longer side awns. Palea ovate, spathulate, ciliate on margin, apex erose or depressed. Stamens 3, anthers short. Styles 2, stigmas plumose.

On rocks covered soils.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1785 Pariong (Khasi Hills).

Triticum Linn.

Triticum aestivum Linn. Sp. Pl. 85. 1753; Bor in Fl. Assam 5: 84. 1940 et Grass. Burm. Ceyl. Ind. Pak. 679. 1960; Chien-chang Hsu in Hara Fl. East. Himal. 379. 1966; Babu Herb. Fl. Dehra Dun 652. 1977.

Vern.- 'Kew' (K).

Annuals. Culms erect, fistular, nodes glabrous. Leaves 30-40 x 0.5-1 cm, sheaths glabrous. Ligule 2 mm long. Spikes 10 cm long, rhachis compressed, ciliate. Spikelets laterally compressed 3-5-flowered rarely 7-flowered, 1 cm long; glumes

ovate, hairy, 5-7-nerved, rounded at the base, apex keeled, awn up to 1 cm long. Lemma 5-nerved, awned 7-10 cm long, scabrid. Paleas 2-keeled, entire, obtuse or truncate, with ciliate keels. Stamens 3, anthers 4 mm long, ovary hairy.

Cultivated for its grains, often seen as an escapse, along banks of streams and rivers.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1656 Phulbari (Garo Hills).

Vetiveria Lem.-Lisanc.

Vetiveria zizanioides (Linn.) Nash in Small Fl. South East. U. S. 67. 1903; Bor in Fl. Assam 5: 354. 1940 et Grass. Burm. Ceyl Ind. Pak. 258. 1960; Babu Herb. Fl. Dehra Dun 653. 1977. - - Phalaris zizanioides Linn. Mant. Pl 2: 183. 1771.

Perennials. Culms tufted, stout, up to 2 m high, compressed, rootstock condensed into a clump. Roots tufted, stems very glabrous even at the nodes, golden yellow, sweet scented. Leaves 40-100 x 0.5-1.5 cm, glabrous, margin scabrid, midrib prominent, channelled, sheaths loose, membranous, hyaline , glabrous. Ligule a scarious rim. Inflorescence a contracted panicle, 20-35 cm long, racemes whorled at each joint, branches shorter gradually towards the apex. Axis glabrous, Spikelets linear, lanceolate, spiny, 4-5 mm long, purplish or olive-grey. Callus 1 mm long, obtuse, glabrous. Lower glumes as long as

nerveless or obscurely 5-nerved, mucronate; upper glumes similar to the lower ones. Lemma of upper spikelets glabrous, 2-3 mm long, mucronate. Stamens 3. Styles 2, stigmas feathery.

Frequent in lower elevations. Roots and rhizomes aromatic used for flavouring drinks.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1274 Lamin (Jaintia Hills); 1335 Barapani (Khasi Hills); 1461 Phulbari (Garo Hills).

Zea Linn.

Zea mays Linn. Sp. Pl. 971. 1753; Hook.f. Fl. Brit. India 7: 102. 1896; Bor in Fl. Assam 5: 452. 1940 et Grass. Burm. Ceyl. Ind. Pak. 270. 1960; Babu Herb. Fl. Dehra Dun 654. 1977.

Vern.- ' Riewhaden' (K). 'Me.rakku' (G). 'Sarew' (J).

Robust annuals. Culms erect, rooting in the lower nodes 1.5-3 m high, jointed. Leaves linear bent in the middle, 40-50 x 2-10 cm, tapering to the setaceous point, hairy, margin scabrid, midrib prominent; sheaths longer than the internodes, striate, margin membranous. Ligule membranous, ciliate. Panicle of male flowers terminal, axis hairy. Spikelets in pairs, one pedicelled and the other sessile. Pedicelled spikelets ovate or lanceolate, 5-8 mm long; lower glumes ovate-oblong, 7-11-nerved, hairy on the back, truncate; upper glumes larger than the lower

glumes with few nerves. Lemmas ovate, lanceolate, as long as the glumes, hyaline, 5-nerved, apex truncate, ciliate. Palea similar to the lemma. Stamens 3. Sessile spikelets longer than the pedicelled ones. Female inflorescence axillary, enclosed in the axil of the lower 1 or 2 leafsheaths. Spikelets rounded or denticulate, seated on the cavity of the spongy axis, arranged in 10-15 longitudinal rows. Styles long, wiry or silky, emerging out from the bracts at the apex of the conical or obconic inflorescence.

Cultivated in gardens for their nutritious grains. One of the staple foods of the people of Meghalaya.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 3022 Shillong.

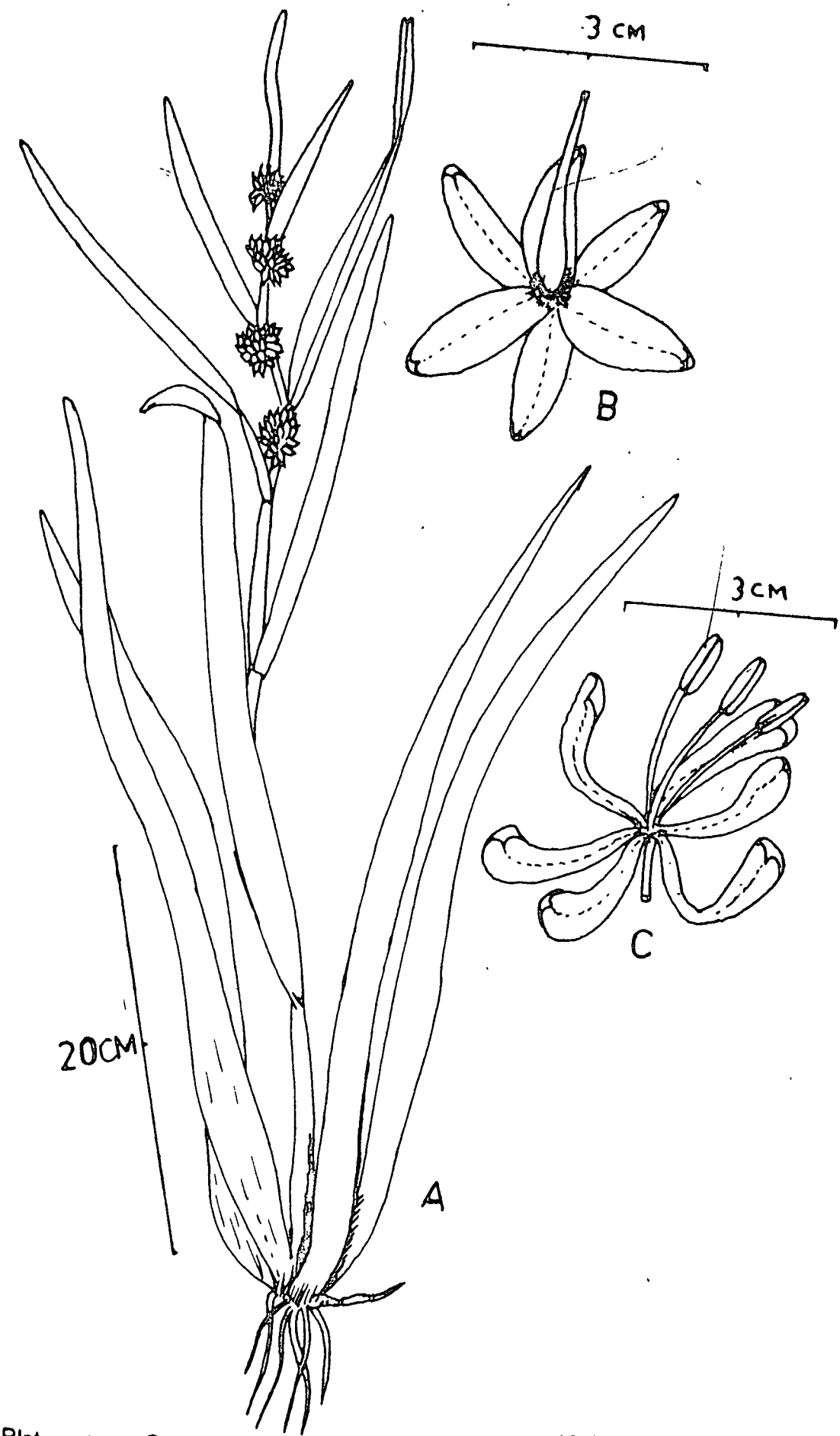


Plate 70 Sparganium emosum L.Rich. A.Habit, B.Male flower, C.Female flower.

TYPHALES

Sparganiaceae

C. H. Schultz. Syst. Nat. Pflanzenr. 295. 1832.

Stolonifereous, aquatic herbs, perennating by rhizomes. Roots fibrous, spongy. Leaves radical or cauline. Inflorescence a globose, unisexual head, subtended by leafy bracts. Perianth 3-6, scale-like. Stamens in male flowers 3; female flowers: carpels 1, rarely 2; ovary 1-locular, rarely 2-locular. Fruits drupaceous, beaked.

Sparganium Linn.

Sparganium emersum Rehmann. Verh. Naturf. Vereins Brunn 10: 80. 1871; Rao & Verma in Bull. bot. Surv. India 18(1-4):9. 1976. - - S. simplex Huds. Fl. Angl. 401. 1778; ; Hook.f. Fl. Brit. India 6: 490. 1893 (Plate 69).

Vern.-' Shlam ' (K).

Shallow-water or marshy herbs. Stems erect, 20-60 cm high, spongy. Leaves as long as , or shorter than the spongy stem, apex obtuse or notched, triquetrous towards the base, radical leaves with sheathing base, usually with cross-veins. Male flowers above the female ones, perianth 6, about 3 mm long, scarious, expanded towards the apex; stamens 3, as long as the perianth segments. Female flowers: perianth 3-6, cuneate, about 2 mm long; Carpels 1, ovary 1-locular, rarely 2-locular. Fruit a drupe, beaked.

Common in water channel and in stagnant tanks, ditches etc. It offers good shelter to fishes and other aquatic organisms in the ecosystem. In marshy places acts as a good soil binder.

Fls. & Frts.: August to October.

Specimens examined: Myrthong 1707 Shillong; 1786 Pariong (Khasi Hills).

BROMELIALES

Bromeliaceae

A. L. de Juss. Gen. Pl. 49. 1789.

Acaulescent herbs. Leaves radical, densely clustered. Flowers regular, rarely irregular, hypogynous or epigynous in terminal spicate or paniculate inflorescence. Perianth 6, in 2-series; outer 3, sepaloid imbricate free or connate; inner 3, petaloid, free or connate. Stamens 6, in 2-series; adnate to the base of perianth tube or free. Style slender , stigma 3-lobed; ovary inferior, 3-celled, with axile placenta. Fruit a compound or multiple berry. Seeds winged or hairy.

Ananas Adans.

Ananas comosus (Linn.) Merr. Interpr. Herb. Amb. 133. 1917. - - Bromelia comosa Linn. in Stickman, Herb. Amb. 21. 1754. - - Ananas sativus Schult. f. Syst. 7: 1283. 1230.

Vern.- ' Sohtrun' (K).

Perennial, leafy herbs. Leaves spirally arranged, forming rosettes; 30-60 x 4-8 cm, glaucous, serrate, [illegible] apex sharp pointed. Flowers irregular, epigynous in terminal, dense

globose or oblong cone-like spikes with a crown of leafy bracts at the apex. Sepals 3, connate at base; petals 3, imbricate, pink; stamens 6, in 2-seires, outer 3, free, inner 3, adnate to the base of petals; carpels 3; style filifrom, slender; stigma 3-lobed; ovary inferior, 3-celled. Fruits fleshy, a multiple berry. Seeds compressed.

Cultivated throughout warmer parts of Meghalaya, specially in slopes of Hills for the juicy fruits. The fruits are extensively exported to other parts.

Fls. & Frts. : Major part of the year.

Specimens examined. Myrthong 3142 Baghmara (Garo Hills).

ZINGIBERALES

Musaceae

A. L. de Juss. Gen. Pl. 61. 1789.

Tree-like herbs with thick rhizomes. Leaves large, oblong with convolute leafsheaths forming a distinct pseudostem. Flowers bisexual, unisexual or polygamous, monoecious due to the abortion of either stamens or pistil within a large spathaceous inflorescence. Perianth 6, in 2-series, differentiated into calyx and corolla, united or free. Stamens 6, 5 fertile and 1 reduced to a staminode; filaments free; anthers linear; styles filiform; stigma capitate or lobed; ovary 3-celled; ovules many. Fruit a large, fusiform, fleshy berry. Seeds smooth or grooved with hard testa, mealy, perisperm or with scanty or without endosperm.

Musa Linn.

Musa paradisiaca Linn. Sp. Pl. 1043. 1753;

Vern.-' Ka Kait ' (K); 'Thuruk' (G); 'Ladew' (J).

Stoloniferous herbs. Pseudostem cylindric, 5-10 m high, 20-30 cm across. Leaves oblong, green, 1-2 m x 50-60 cm, petioles stout 20-40 cm long, deeply channelled, leafy sheaths spongy. Inflorescence pendulous, 1-1.5 m at anthesis; staminate flowers and bracts sub-persistent; pistillate flowers at the base. Bracts large, spathaceous, cymbiform, reddish-brown. Calyx tubular, spathaceous, split down on one side, 3-5-lobed; corolla a single convex membranous petal, as long as the calyx and opposite its slit, embracing the base of the stamens and style. Filaments erect, stout; anthers linear, erect, 2-celled; ovary 3-celled; ovules many; styles filiform thickened at base; stigmas subglobose, 6-lobed. Berry fusiform, obtusely 3-5-angled, contracted at base. Seeds minute or obsolete, black, embedded in fleshy pulp.

Fairly cultivated in the State.

Fls. & Frs. : Throughout the year.

Specimens examined: Myrthong 1219 Burnihat. (Khasi Hills).

Apart from M. paradisiaca which is cultivated, a few more wild species also occur in abundance in most jhummed areas on hills, in the state. Since many of them could not be collected in flowers, their correct determination could not be done; as such they are excluded in the present study.

Zingiberaceae

Lindl. Key Struct. Phys. Syst. Bot. 69. 1835.

Perennial, aromatic herbs or undershrubs. Leaves radical or cauline, linear-laceolate or ovate-lanceolate, differentiated into sheath, petiole and blade; ligule membranous or scarious. Flowers bisexual, rarely unisexual, zygomorphic, epigynous. Perianth 6, in 2-whorls; outer whorl more or less tubular below; inner whorl petaloid, tubular below; limb divided above into similar or dissimilar lobes; the posterior segment is larger than the outer 2-lateral lobes. Stamens in 2-whorls; only the median posterior stamen is perfect, the connective flat or broad, fleshy; the 2-lateral stamens of the inner whorl united together forming a lip or labellum; the other 2-stamens of the outer whorl reduced to petaloid staminodes; median one may be absent or sometimes the entire outer segments absent. Ovary 3-locular, rarely 1-locular; placentas axile in the 3-locular ovary and parietal in 1-locular ovary; ovules many; styles long, passing through the furrow or connective of the anthers; carpels 3, united. Fruits capsular. Seeds arillate.

K E Y T O G E N E R A

1a. Inflorescence compact with terminal plumes of barren bracts; bracts laterally and partially adnate, forming pouches . . . . . .Curcuma

1b. Inflorescence compact or lax, without terminal plumes of barren bracts; bracts otherwise . . .

2a. Lateral staminodes petaloid, free from the lip.

3a. Lip deflexed, confluent with the filament for some lenth; filaments longer than the lip . . . . . Globba

3b. Lip erect or suberect, free from the filament; filaments shorter than the lip (except in Hedychium).

4a. Connective spurred at the base.

5a. Flowers purple or white; capsules subdehiscent . . . . . Roscoea

5b. Flowers yellow; capsules dehiscent with recurved valves . . . Cautleya

4b. Connective not spurred at the base.

6a. Leaves 5-15 cm long; flowers few; anthers with a petaloid crest . . . . Caulokaempferia

6b. Leaves longer than the above; flowers numerous; anthers not crested.

7a. Inflorescence compact; bracts with prominent recurved tips, white, greenish tinged; staminodes rotundate, shorter than the lip . . . . . Hitchenia

7b. Inflorescence compact or lax; bracts with straight tips, uniformly green or brown; staminodes linear, oblong or spathulate, as long as or longer than the lip.. Hedychium

2b. Lateral staminodes absent, tooth-like, adnate to the lip.

8a. Inflorescence terminal in lax panicle . . . Alpinia

8b. Inflorescence radical in dense spikes.

9a. Lateral staminodes petaloid, free from the lip.

10a. Anthers with petaloid crest . . . . Kaempferia

10b. Anthers without petaloid crest.

11a. Lateral staminodes, lip and filament confluent at the base, forming a campanulate tube . . Curcumorpha

11b. Lateral staminodes, lip and filament free to the base.

12a. Corolla lobes 1-1.5 cm long; staminodes 1 cm long; ovary 1-celled . . . . . Hemiorchis

12b. Corolla lobes longer than the above; staminodes 2-3 cm long; ovary 3-celled . . . Boesenbergia

9b. Lateral staminodes tooth-like, adnate to the lip or absent.

13a. Lip ligulate . . . . . Hornstedtia

13b. Lip oblong-obovate or suborbicular.

14a. Connective appendage at the tip broad, petaloid . . . . . Amomum

14b. Connective appendage at the tip beak-like . . . . . Zingiber

Alpinia Linn.

Rhizomes creeping. Leafy stem tall. Leaves cauline, sessile or petiolate, oblong or lanceolate; ligule short. Inflorescence terminal racemes or panicles. Bracts large, enveloping the young inflorescence. Bracteoles enveloping the bud. Calyx tubular, 3-toothed; corolla tube as long as the calyx, rarely longer than the calyx; lobes linear-oblong; staminodes a pair of subulate processes at the base of the lip or sometimes absent; lip variously coloured, clawed or sessile, 3-(sometimes 2-) fid; stamens shorter than lip; anthers neither crested nor spurred; ovary 3-celled; styles filiform; stigmas subglobose. Fruits globose, dry or fleshy. Seeds globose or compressed, arillate.

K E Y T O S P E C I E S

1a. Inflorescence a raceme, bracteoles 2.5-4 cm long, completely enclosing the flower-buds. . . . malaccensis.

1b. Inflorescence a panicle; bracteoles small, not enclosing the flower-buds.

2a. Panicles broad with at least the lower few branches 5-15 cm long; lip white with a median pair of pink lines; capsules black . . allughas

2b. Panicles narrow with its branches not more than 1 cm long; lip white, streaked and dotted with pinkish-red in the centre; capsules orange-red.

3a. Leaves 30-60 x 10-15 cm, not aromatic; panicles 15-30 cm long . . . . galanga

3b. Leaves 20-30 x 2.5-5 cm, strongly aromatic; panicles 10-12 cm long . . . . calcarata

Plate 71 Alpinia allughas (Retz.) Rosc. A. Portion of plant, B. Flower, C. Stamen with Pistil.

Alpinia allughas Rosc. in Trans. Linn. Soc. 8: 346. 1807; Baker in Hook.f. Fl. Brit. India 6: 253. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 139. 1972.

Rootstock prostrate, long. Leafy stems 3-5 m high. Leaves 30-50 x 5-15 cm, sessile, glabrous, acute. Ligule short, erect. Panicles, erect, branched; branches stout, pubescent. Flowers shortly pedicelled, pedicels dilated above. Bracts small, pale or straw coloured, amplexicual. Calyx 0.5-1 cm long, hairy, mouth of calyx tube oblique; corolla tube as long as the calyx; corolla segments reflexed, 8 mm long, lip with distinct claw, pinkish white, 2-fid; stamens shorter than the lip, fleshy, passing through the filament, stigma passing through the clavate anther cells. Capsule globose, deep brown or black, shining.

Common in marshes in forests as well as along the streams, rivers etc.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 3111 Garumpani (Jaintia Hills)

Alpinia calcarata Rosc. in Trans. Linn. Soc. 8: 347. 1807; Baker in Hook.f. Fl. Brit. India 6: 254. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 139. 1972.

Rhizomes prostrate, thick; roots fibrous, thick. Leafy stems 2-3 m high, clothed with leafy-shaaths, basal sheaths brown, short, ovate, cymbiform. Leaves 25-30 x 5-10 cm, glabrous, pointed at both ends; ligules short, 3-4 mm long, membranous. Panicles 10-12 cm long, spreading, rhachis hairy, lower branches

very short, bearing 2-3 flowers. Calyx tube funnel-shaped, about 1 cm long, dilated above, indistinctly 3-lobed; corolla tube much longer than the calyx tube; lobes oblong, 1.5-2 cm long; staminodes a pair of about 2.5-3 mm long, hairy, subulate processes; lip obovate, cuneate, 2-fid, as long as corolla lobes, white with red streaks and dots in the middle; filaments 1.5 cm long; anthers 0.8-1 cm long, ovary villous. Capsules orange red, globose.

Common in forests along the edges of marshes and rivulets.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1942 Way to Tura peak (Garo Hills).

Alpinia galanga (Linn.) Sw. Obs. Bot. 8. 1791; Baker in Hook.f. Fl. Brit. India 6: 253. 1892; Rao & Verma in Bull. Bot. Surv. India 14(1-4): 139. 1972. - - Maranta galanga Linn. Sp. Pl. ed. 2: 2. 1762.

Stems 2-3 m high. Leaves shortly petioled, softly hairy beneath. Panicles narrow, rhachis tomentose; bracts whitish, as long as the bracteoles, lower ones, shorter. Calyx 0.5-1.2 cm, long, softly hairy; corolla lobes oblong, 2 cm long; lip elliptic, longer than corolla lobes, 2-fid, white with pink nerves, toothed; staminodes a pair of 4-5 mm long reddish, subulate processes; filament 1.2 cm long, anthers 1 cm long. Fruits globose, yellowish-

green to orange-red at maturity.

Common in edges of forests and in shady areas, as forest undergrowth.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 2982 Sunapahar (Khasi Hills).

Alpinia malaccensis (Burm.f.) Rosc. in Trans. Linn. Soc. 8: 345. 1807; Baker in Hook.f. Fl. Brit. India 6: 255. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 140. 1972. - - Maranta malaccensis Burm. f. Fl. Ind. 2. 1768.

Rootstocks stout. Stems 2-3 m high. Leaves 30-60 x 10 cm, pubescent beneath, apex caudate, base cuneate, petiole 1-2 cm long; ligules membranous, leathery. Racemes 20-30 cm long; rhachis stout, very hairy. Flowers 1-3 together. Pedicels 0.2-1 cm long, pubescent. Buds enclosed by large, membranous bracteoles. Bracteoles 1.5-2.5 cm long, navicular, straw-coloured. Calyx tube campanulate, 1.5 cm long, split on one side, hairy; corolla tube as long as, or shorter than calyx, lobes oblong, 2.5-4 cm long, pinkish white; lip ovate, emarginate, twice the length of the segments, reflexed, with brown spots or dots on the inner face; stamen 1, filament stout, fleshy; anthers not crested; style passing through the filament, stigma embraced by anther cells.

Fruits globose, 1.5-2 cm across, orang-yellow at maturity. Seeds ovoid, 5 mm long.

Common in forests along the banks of streams, rivulets and on the gorges.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1668 Umling (Khasi Hills); 3134, 3135 Tura Peak (Garo Hills).

Amomum Linn.

Perennial herbs. Rhizomes creeping. Leafy stems tall. Leaves cauline, sessile or petioled, lanceolate, ovate or oblong. Ligules membranous, brown. Spikes radical, globose or oblong, on short or long peduncles. Bracts imbricate. Calyx cylindric, 3-lobed; corolla tube as long as the calyx; lobes oblong or linear-oblong; lateral staminodes minute or obsolete; lip ovate, cuneate, lobed or entire; stamens shorter than lip, connective produced into a petaloid anther crest; ovary 3-celled; styles filiform; stigma small, subglobose. Fruit a capsule, or a berry, smooth or winged or ribbed. Seeds globose, truncate.

K E Y T O S P E C I E S

1 1a. Leaves contemporaneous with flowers, silvery, pubescent beneath . . . . . dealbatum

1b. Leaves appearing before flowers.

2a. Spikes globose.

3a. Peduncles 5-15 cm long; lip yellow, long; anther crest, lobed . . . . . .aromaticum

3b. Peduncle up to 10 cm long;lip whitish yellow, stripped with red-yellow spots in the centre; anther crest suborbicular . . . . corynostachyum

2b. Spikes elliptic or oblong.

4a. Peduncles 5-10 cm long; lip recurved,bright yellow; anther crested . . . . . liguiforme

4b. Peduncles 1-2 cm long; lip yellow, with fine purple veins; anthers not crested . . . . . nemorale

Amomum aromaticum Roxb. Fl. Ind. 1: 45. 1832; Baker in Hook.f. Fl. Brit. India 6: 241. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 135. 1972

Rhizomes prostrate, covered with leafy bracts. Leafy stems 70-100 cm high. Leaves sessile or very shortly petioled, 30-50 x 5-8 cm, oblong-lanceolate, apex acute, base cuneate, glabrous; ligules membranous, truncate. Peduncles 5-15 cm high, clothed with leafy bracts. Spikes globose, 3-5 cm across. Bracts orbicular, 2-4 cm long, pale brown. Calyx 2.5 cm long; corolla tube as long as or shorter than the calyx tube; segments obtuse, as long as the tube, whitish brown; lip yellow, very long, twice longer than the segments, outcurved; filaments fleshy, short; anthers crested, large, petaloid, with rounded lobes; styles passing through the filament, stigma embraced by the anther cells. Capsules oblong, 2 cm long, pointed at both ends, very aromatic. Seeds 6, 5 mm long, ovoid.

Occasional in grasslands, in forests.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 3128 Tura Peak. (Garo Hills).

Amomum corynostachyum Wall. Pl. As. Rar. 1: 48. t. 58. 1830; Baker in Hook.f. Fl. Brit. India 6: 238. 1892; Rao & Verma in Bull. bot. Surv. India 11: 245. 1971 et in 14(1-4): 135. 1972.

Rhizomes short. Leafy stems 70-80 cm high, clothed with leafsheaths. Leaves 40-50 x 4-8 cm, oblong, acute, apex finely acuminate, base cuneate, shortly petioled, glabrous; ligules 6 mm long, 2-lobed. Peduncles about 6 cm long, clothed with brown or straw-coloured leafy bracts. Lower leafy bracts about 2 cm long, upper ones up to 4 cm long, obtuse, navicular. Spikes globose, 3-4 cm across. Calyx 1-1.5 cm long; corolla tube as long as calyx tube; segments oblong, shorter than the tube. Lip about 2 cm long, orbicular, whitish yellow, striped with yellow in the middle; filaments short; anthers glabrous with white, entire petaloid crest. Capsules elliptic, beaked.

Common under Sal trees (Shorea robusta)

Fls. & Frts. : May to August.

Specimens examined: Myrthong 3140 Baghmara (Garo Hills).

Amomum dealbatum Roxb. Fl. Ind. 1: 43. 1820 var. sericeum (Roxb.) Baker in Hook.f. Fl. Brit. India 6: 239. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 135. 1972. - - Amomum sericeum Roxb. Fl. Ind. 1: 46. 1820.

Rhizomes slender, very long, jointed. Roots slender, mostly on one side of the prostrate rhizomes. Leafy stems 60-120 cm high, clothed with leafsheaths. Leaves linear-lanceolate, 30-40 x 4-8 cm caudate, base rounded or cuneate, finely silvery, pubescent beneath, deep green above. Petioles 3-6 cm long;

ligules 5 mm long, membranous. Spikes sessile or shortly pedunculed, about 5 cm across, globose. Outer bracts 3 x 2 cm, apex rounded or truncate. Calyx 3 cm long; corolla tube slightly shorter than the calyx. Segments oblong, obtuse, white striped with yellow and red veins; filaments fleshy, short; anthers small, crested, slightly 4-angled or subterete. Capsules ovoid. Seeds arillate, white.

Common on roadsides and in scrub-jungles, in association with broom grasses and ferns.

Fls. & Frts.: May to July.

Specimens examined: Myrthong 3264 Balat (West Khasi Hills).

Amomum liguiforme Benth. in Gen. Pl. 3: 664. 1883; Baker in Hook.f. Fl. Brit. India 6: 235. 1892;

Rhizomes stoloniferous, branched with dry cymbiform bracts. Leafy stems 2-4 m high. Leaves 30-50 x 3-5 cm, oblong-lanceolate, glabrous, acuminate or acute. Peduncles developing from base of the rhizomes, erect or decumbent, as long as the spikes, covered with dry leafy bracts. Spikes about 5-8 cm long, few flowered. Flowers pink, with yellow lip. Bracts linear. Calyx tube 2.5-3 cm long; corolla tube as long as calyx; lip recurved, 2-fid, bright yellow with red stripes, much longer than the segments and placed opposite to the stamen; stamens shorter than the segment; filaments thick, fleshy; anthers clavate, 2-celled; styles passing through the filaments; stigmas hairy, capitate.

Common in forests under the shrubby plants, forming the ground flora.

Fls. & Frts. : October.

Specimens examined: Myrthong 2906 Tura (Garo Hills).

Amomum nemorale Benth. in Gen. Pl. 3: 644. 1883; Baker in Hook.f. Fl. Brit. India 6: 233. 1892.

Rhizomes slender, profusely branched. Leafy stems 60-120 cm high, distantly clothed with leafy bracts. Leaves 20-30 x 5-8 cm, glabrous, cuneate at base, apex caudate, terminal leaves linear, 10-20 x 2-3 cm, midrib prominent in the ventral face; petioles short, 8 mm long; ligules truncate, membranous. Peduncle 1-2 cm long, decumbent, clothed with small leafy bracts, navicular, straw or slightly brown-coloured. Spikes as long as the peduncles, few flowered. Bracts 1.5 cm long, glabrous. Corolla tube 1.5-2 cm long; segments short, obtuse; lip yellow, with fine purple veins; filaments short; anthers short, 2-celled, not crested; styles passing through the filaments; stigmas embraced by the anther cells. Capsules 1 cm long, globose, shortly beaked.

Common in forests, on slopes of the hills and in Sal plantations.

Fls. & Frts. : May to August.

Specimens examined: Myrthong 3146 Baghmara (Garo Hills).

Boesenbergia Kuntze

Boesenbergia rubrolutea (Baker)·Kuntze Rev. Gen. Pl. 685. 1891; Roa & Verma in Bull. Bot. Surv. India 14(1-4): 123. 1972. Gastrochilus rubrolutea Baker in Hook.f. Fl. Brit. India 6: 218. 1890.

Perennials. Stems 10-30 cm high. Leaves sessile, oblong, 15-20 cm long. Spikes terminal on the leafy stem or radical on separate peduncle. Bracts closely sheathing. Corolla tube as long as bracts; lobes 2-3 cm long, red; staminodes longer than corolla lobes, yellow; lip oblong, cuneate; upper half red, lower yellow. Stamens as long as staminodes.

Rare, collected once only at Umsning.

Fls. & Frts. : October.

Specimens examined: Myrthong 3300 Unsning (Khasi Hills).

Caulokaempferia Larsen

Annual, slender herbs. Leaves sessile or shortly petioled, linear-lanceolate, or ovate-oblong. Spikes terminal, few flowers. Bracts green linear-lanceolate. Calyx tubular, shorter than the bracts. Corolla tube as long as or longer than the bracts.

lobes oblong-lanceolate; staminodes petaloid; lip ovate, emarginate or entire. Filaments short or obsolete; connective produced into petaloid crest; ovary 3-celled; styles adnate to the filaments; stigma passing inbetween the anther cells, ciliate. Capsules oblong.

K E Y T O S P E C I E S

1a. Leaves linear-lanceolate, 0.5-2 cm across; bracts linear-lanceolate; flowers white. . . . . linearis

1b. Leaves ovate-lanceolate, 2-5 cm across; bracts oblong-lanceolate; flowers pink . . . . . secunda

Caulokaempferia linearis (Wall.) Larsen in Saertryk Af Botanisk Tidsskrift 60: 170. 1964; Rao & Verma in Bull. bot. Surv. India 14(1-4): 125. 1972. - - Kaempferia linearis Wall. in Roxb. Fl. Ind. 1: 20. 1820; Baker in Hcok.f. Fl. Brit. India 6: 223. 1890.

Roots fibrous. Leafy stems 10-20 cm high, completely clothed with leafsheaths. Leaves 3-10 x 0.5-1.2 cm, 5-7-nerved, linear-lanceolate, acuminate; ligules 5-7 mm long, membranous. Spikes 1-2-flowered. Flowers white, bracts 2-5 cm long, cymbiform. Outer corolla segments with slight depression at the tip, inner ones incurved; staminodes equaling the corolla segments; lip 1-2 cm long, entire or notched; anther crest orbicular; styles short; stigma turbinate. Capsules 1.5-2 cm long.

Plants growing on rocks and on walls. Not very common.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1890 Mawmluh (Khasi Hills).

Caulokaempferia secunda (Wall.) Larsen in Saetryk Af Botan Botanisk Tidsskrift 60: 170. 1964; Rao & Verma in Bull. bot. Surv. India 14(1-4): 125. 1972. - - Kaempferia secunda Wall.in Roxb. Fl. Ind. 1: 19. 1820; Baker in Hook.f. Fl. Brit. India 6: 223. 1890.

Roots tuberous, base of stems pink. Leafy stems 10-30 cm high. Leaves 5-12 x 2-3 cm, apex finely acuminate, unequal sided, 5-7-nerved, sheaths extending into a thin membranous ligule. Spikes 2-5-flowered. Bracts green about 3 cm long, acute. Calyx tube linear, .1-1.5 cm long; corolla tube up to 4 cm long, segments about 1 cm long; lateral staminodes larger than the corolla segments; anthers crested, large, ovate; styles passing through the anther cells. Capsules 1 cm long.

Common on rocks and in scrub jungles, during monsoon.

Fls. & Frts.: July to October.

Specimens examined: Myrthong 1865 Mawmluh (Khasi Hills).

Cautleya Royle

Cautleya gracilis (Smith) Dandy in Journ. Bot. 70: 328. 1954; Hara Fl. East. Himal. 421. 1966; Rao & Verma in Bull. bot. Surv. India 14(1-4): 121. 1972. - - Roscoea gracilis Smith in Trans. Linn. Soc. 13: 460. 1822. - - R. lutea Royle Ill. Bot.

Himal. 361, t. 89, f. 2. 1839. - - Cautleya lutea Royle Ill. Bot. Himal. 361. 1839; Baker in Hook.f. Fl. Brit. India 6: 208. 1890; Thothathri in Rec. bot. Surv. India 20: 219. 1973.

Vern.-' Shynraikhla ' (K).

Roots fleshy. Leafy stems 30-60 cm high. Leaves sessile, 4-25 x 1-4 cm, lanceolate, finely acuminate; ligules 2 mm long, membranous. Spikes short, 4-8 cm long, few flowered. Bracts 1 cm long, acute, cymbiform. Flowers yellow. Calyx tube 1-2 cm long, linear, oblong, red; corolla tube 3 cm long; segments 1-1.5 cm long, lower segment equalling the upper ones, cuneate, oblong, deflexed; staminodes slightly shorter than the upper segments, base spurred; lip 1.5 cm long, 2-lobed; filaments as long as the segments; anthers linear; styles passing through the anther cells. Capsules globose, valves fleshy. Seeds small, flat at the top.

Common in forests specially on wet moss covered rocks, walls and on tree trunks.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1102 Shillong; 1764 Burnihat; 3047 Mawphlang (Khasi Hills).

Curcuma Linn.

Perennial herbs or undershrubs with profusely branched rhizomes. Roots stout, often ending in ellipsoid tubers. Leaves large, oblong; leafsheaths convolute forming a spurious stem. Spikes compact, subcylindric, either in the centre of the leaf-sheaths or develop separately from the leafy shoots. Bracts obovate-oblong, connate in the lower part, some sterile (Plumes

or commas) bracteoles scarious. Calyx tubular, 3-toothed, mostly unilaterally split on the back to half its length; corolla tube inflated at the tip, hairy on the throat; lobes oblong-lanceolate; staminodes petaloid, base connate with the filament; filaments short; anthers not crested; lip orbicular with deflexed tip. Ovary 3-celled, ovules numerous; styles filiform, stigma 2-lobed, ciliate. Fruit, a 3-valved capsule. Seeds ovoid oblong, usually arilate.

K E Y T O S P E C I E S

1a. Peduncles developing laterally, at the base of the spurious stems.
  2a. Leaves with persistent purple flush above on either side of the midrib. . . . . zedoaria
  2b. Leaves uniformly green, or pale green never purple.
    3a. Leaves 15-30 x 5-8 cm; corolla lobes white or yellowish-white . . anguistifolia
    3b. Leaves larger than [illegible] above; corolla corolla lobes pink . . . . . aromatica
1b. Peduncles developing inbetween the leaves.
  4a. Rhizomes pale yellow inside . . . . montana
  4b. Rhizomes deep orange-yellow inside. . . . . domestica

Curcuma angustifolia Roxb. in As. Res. 11: 338. t. 3. 1810; Baker in Hook.f. Fl. Brit. India 6: 210. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 121. 1972.

Vern.-' Tiew Shynrailum ' (K).

Roots fibrous. Leafy stems, very short. Leaves 16-30 x 6-10 cm, lanceolate, glabrous, subacute, base cuneate or rounded. Spikes whitish-pink. Bracts pinkish, about 4-6 cm long. Calyx 1.5 cm long; corolla tube as long as, or longer than the calyx; staminodes 2.5 cm long; lip 3 cm long, emarginate; filaments short, 0.5-1 cm long; anthers 5 mm long; styles filiform; stigma 2-fid; ovary villous.

Common in pine forests and in grasslands.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 1710 Shillong.

Curcuma aromatica Salisb. Parad. London t. 96. 1807; Baker in Hook.f. Fl. Brit. India 6: 210. 1890; Hara Fl. East. Himal. 421. 1966; Rao & Verma in Bull. bot. Surv. India 14(1-4): 122. 1972.

Vern.-' Shynrai or Shyrmit ' (K).

Rhizomes yellow inside, aromatic. Leafy stems 45 cm high. Leaf blade 45-50 x 8-20 cm, pubescent beneath, base slightly narrowed, apex acuminate. Peduncles 20-25 cm long, clothed with scarious leaf bracts, developing separately from the base of the rhizomes. Spikes 12-20 x 4-8 cm, pinkish yellow. Bracts 3-4 x 3 cm pale white, ovate; upper bracts purplish white, much longer than lower ones, deflexed. Flowers shorter than the bracts. Calyx 1.5 cm long; corolla tube 2 cm long, funnel-shaped; staminodes obtuse, equalling the corolla segment; lip deflexed, yellow, obscurely 3-lobed; filaments short; anther cells, contiguous; stigma obscurely 2-fid.

Cultivated in gardens for their aromatic rootstocks, which are used for flavouring curry. Inflorescence as a whole is also used by some village people for preparing curry.

Fls. & Frts. : May to September.

Specimens examined: Myrthong 1675 Umling (Khasi Hills).

Curcuma domestica Valet. in Bull. Buitenz. ser. 2. 27: 31. 1918; Rao & Verma in Bull. bot. Surv. India 14(1-4): 122. 1972. - - C. longa Auct. non Linn. Sp. Pl. 2. 1753; Baker in Hook.f. Fl. Brit. India 6: 214. 1890.

Vern.-' Shynrai' (K).

Rhizomes brownish outside, bright yellow inside, strongly aromatic. Spurious stems 30-70 cm high. Petioles long, deeply channelled; leaves 30-60 x 15-20 cm, glabrous or slightly pubescent beneath, apex acute, base cuneate. Peduncles 15-40 cm long, hidden inbetween the leafsheaths. Spikes 10-20 x 4-8 cm. Bracts 4-5 x 2-3 cm, pale green; those of the coma pinkish or purple. Calyx tube shorter than bracts; corolla tube as long as the bracts; upper portion funnel-shaped, lateral segments oblong, upper ones ovate, concave; staminodes equaling the corolla segment; lip orbicular, deflexed; filaments short; anthers 1 cm long, stigma 2-lobed.

Cultivated in gardens for their rhizomes which are the turmeric of commerce.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 3025 Shillong; 2948 Nongstoin (Khasi Hills).

Curcuma montana Roxb. Cor. Pl. t. 115. 1802; Baker in Hook.f. Fl. Brit. India 6: 214. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 122. 1972.

Vern.-' Tiew-Shynrai ' (K).

Rhizomatous herbs. Rhizomes aromatic, pale yellow or white inside. Leaves up to 40-50 x 10 cm, oblong-lanceolate, apex finely acuminate, base narrowed into long channelled petiole, which is as long as blade. Spikes developing in the centre of the leafy shoots; peduncles embraced by the petioles of leaves, shorter than petioles. Spikes 10-15 x 2-4 cm, broader towards the upper portion. Flowering bracts about 3 cm long , green, plume bracts pink or purple, oblong, reflexed. Flowers as long as the bracts corolla whitish yellow; lip 3-lobed, deflexed.

Common in grasslands and in scrub jungles and in forest clearings.

Fls. & Frts.: June to October.

Specimens examined: Myrthong 2955 Shillong; 3004 Tasak (Garo Hills).

Curcuma zedoaria (Berg.) Rosc. Monandr. Pl.t. 109. 1828; Baker in Hook.f. Fl. Brit. India 6: 210. 1890(Plate 73).

Vern.-' Kynshiang ' (K).

Rhizomes brown inside,pale yellow outside,sometimes tinged with red. Roots sometimes ending in tubers. Leaves oblong, 20-50 x 10-15 cm, purple on either side of the midrib, apex acute, ending in a caudate apex, twisted, base cuneate, Peduncles, 5-10

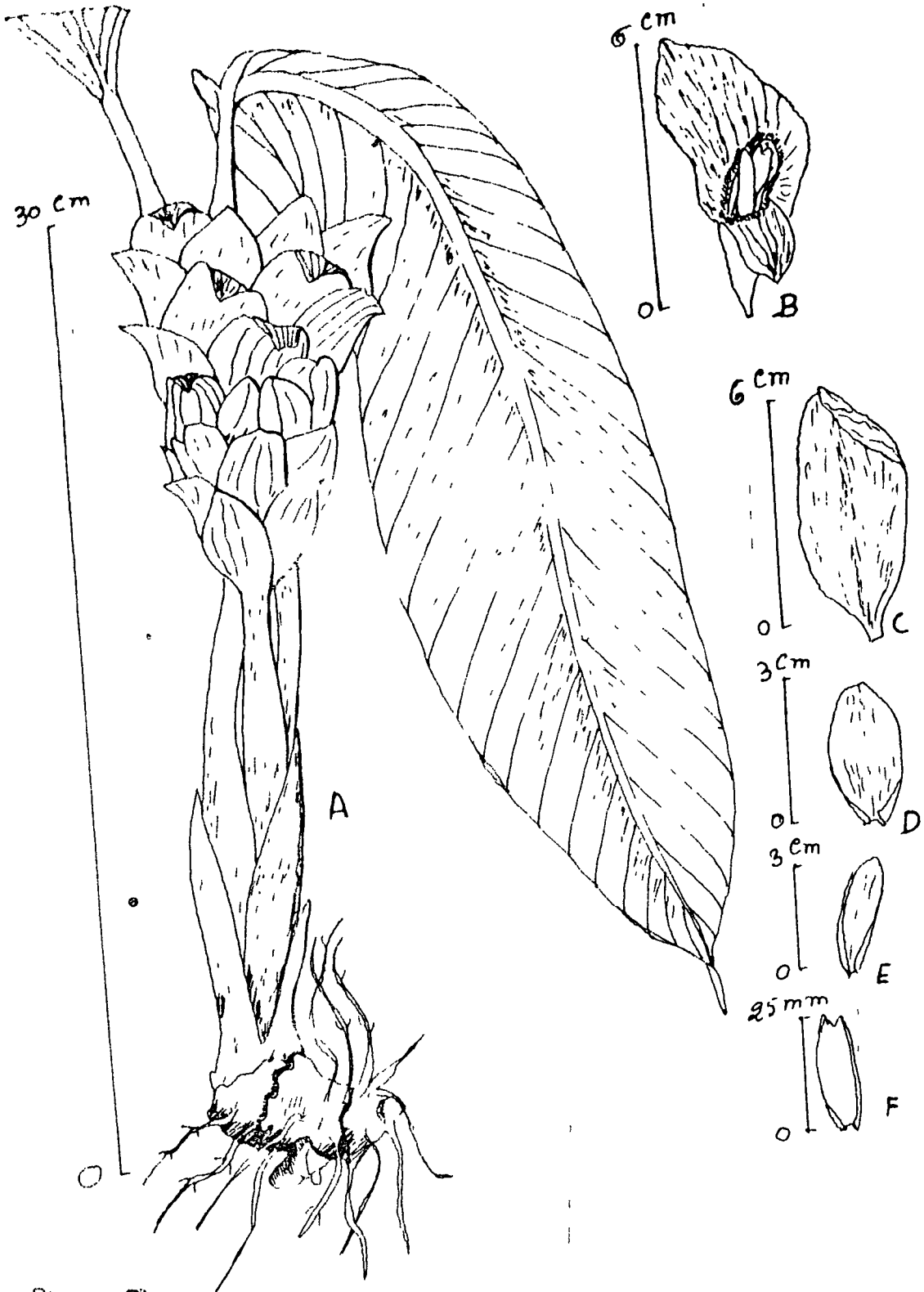


Plate 73. Curcuma zedoaria (Berg.) Rosc. A. Plant after removal of leaf, B. Flower, C Bract, D. Sepals, E. & F. Petals.

cm long. Spikes as long as peduncles, 5-10 cm broad, expanding upwards; lower bracts 4-5 cm long, green, middle purple, upper yellowish or purplish green. Calyx 1 cm long, purplish-white; corolla tube 3 cm long, lobes 1.5 cm long; staminodes shorter than corolla lobes, yellow; lip as long as staminodes but broader, emarginate; filaments 5 mm long, fleshy, slender; anthers 2-celled, 2.5 mm long; ovary villous.

Common in scrub jungles and in forest clearings.

Fls. & Frts. : May to June.

Specimens examined: Myrthong 2956 Umrai (Khasi Hills).

Curcumorpha Rao & Verma

Curcumorpha longiflora (Wall.) Rao & Verma in Bull. bot. Surv. India 13: 339. 1974. - - Gastrochilus longiflora Wall. Pl. As. Rar. 1: 22. t. 25. 1829; Baker in Hook.f. Fl. Brit. India 6: 217. 1890. - - Boesenbergia longiflora Kŧze. Rev. Gen. Pl. 685. 1891 (Plate 74).

Rhizomes short, Leafy stems 10-30 cm high, clothed with convolute leafsheaths. Leaves broad, lanceolate, 12-35 x 6-15 cm, radical, apex acuminate, base rounded. Petioles 12-24 cm long. Peduncles 5-15 cm long, 1-3-flowered. Flowers pinkish-white, inner portion pink with deep red tips; corolla tube about 2 cm long, segments shorter than tube; staminodes as long as the segments; lip broad, 3 x 2 cm, lobed; stamens opposite the lip; anthers 2-celled; ovary 3-celled; ovules many.

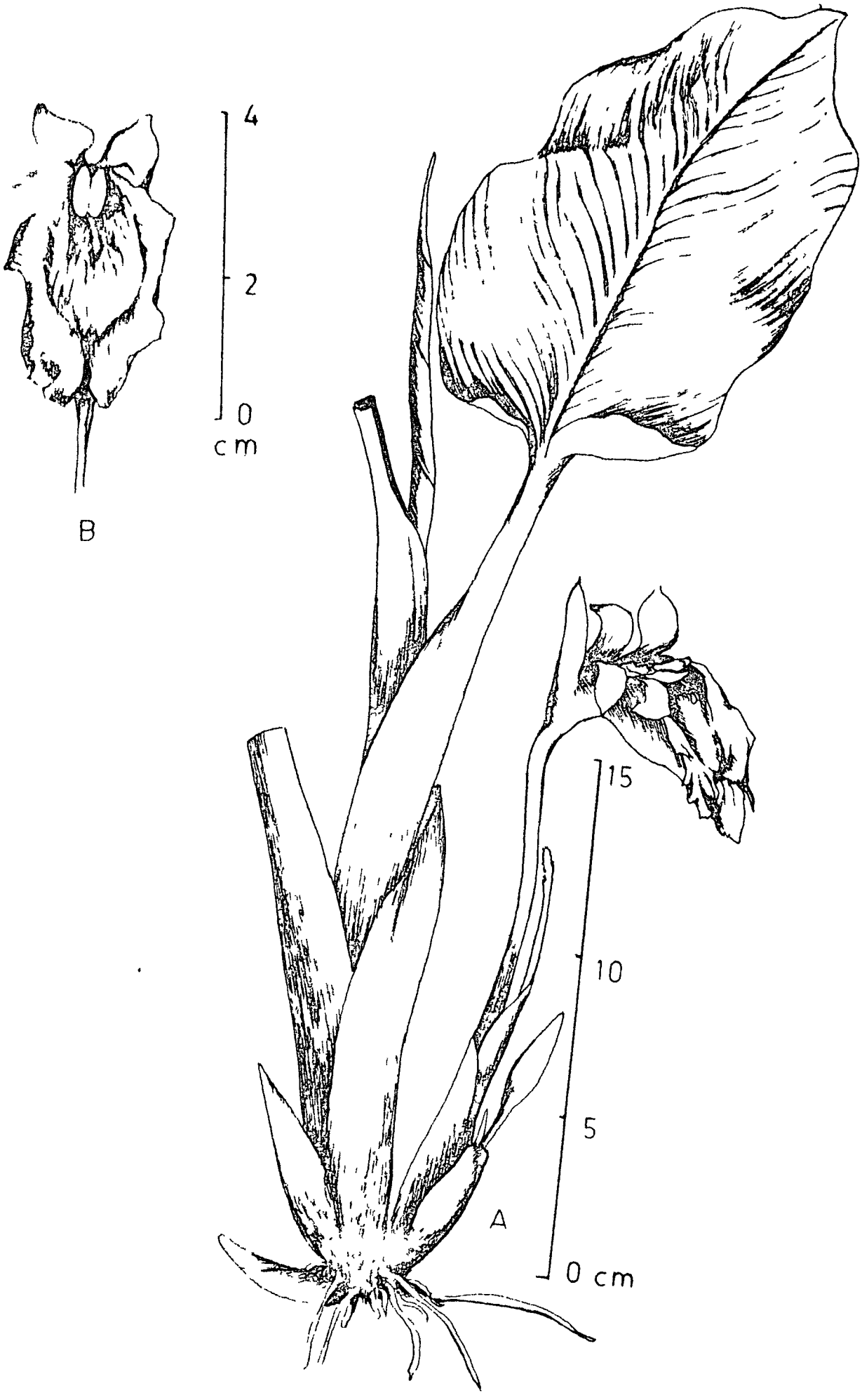


Plate 1: Curcumorpha longiflora (Wall.) Rao & Verma. A. Habit. B. Flower.

Common in deep forest, and in bamboo clumps.

Fls. & Frts.: May to August.

Specimens examined: Myrthong 1730 Burnihat (Khasi Hills); 1994 Tasak (Garo Hills).

Globba Linn.

Perennial, rhizomatous herbs. Leaves sessile or subsessile, oblong-lanceolate, caudate. Inflorescence a terminal panicle or spike. Bracts caducous. Flowers frequently replaced by bulbils. Calyx campanulate; corolla lobes ovate-oblong; staminodes petaloid, lanceolate; lip connate with the filament for a short distance; filament slender, curved; anthers obscurely crested; ovary 1-celled; ovules many. Fruits subglobose, oblong, irregularly dehiscing. Seeds ovoid with small white arils.

K E Y T O S P E C I E S

1a. Rhachis and branches of panicle villous . . . . . multiflora

1b. Rhachis and branches of panicle glabrous.

2a. Calyx purplish brown; flowers almost all replaced by bulbils; lip up to 2 cm long. . . . . clarkei

2b. Calyx yellow; flowers mostly not replaced by bulbils(sometimes 1-3 lower panicle branches replaced by bulbils); lip up to 1 cm long . . . . . racemosa

Globba clarkei Baker in Hook.f. Fl. Brit. India 6: 201. 1890; Rao & Verma in Bull. bot. Surv. India 11: 246. 1969 et in 14(1-4): 118. 1972(Plate 173).

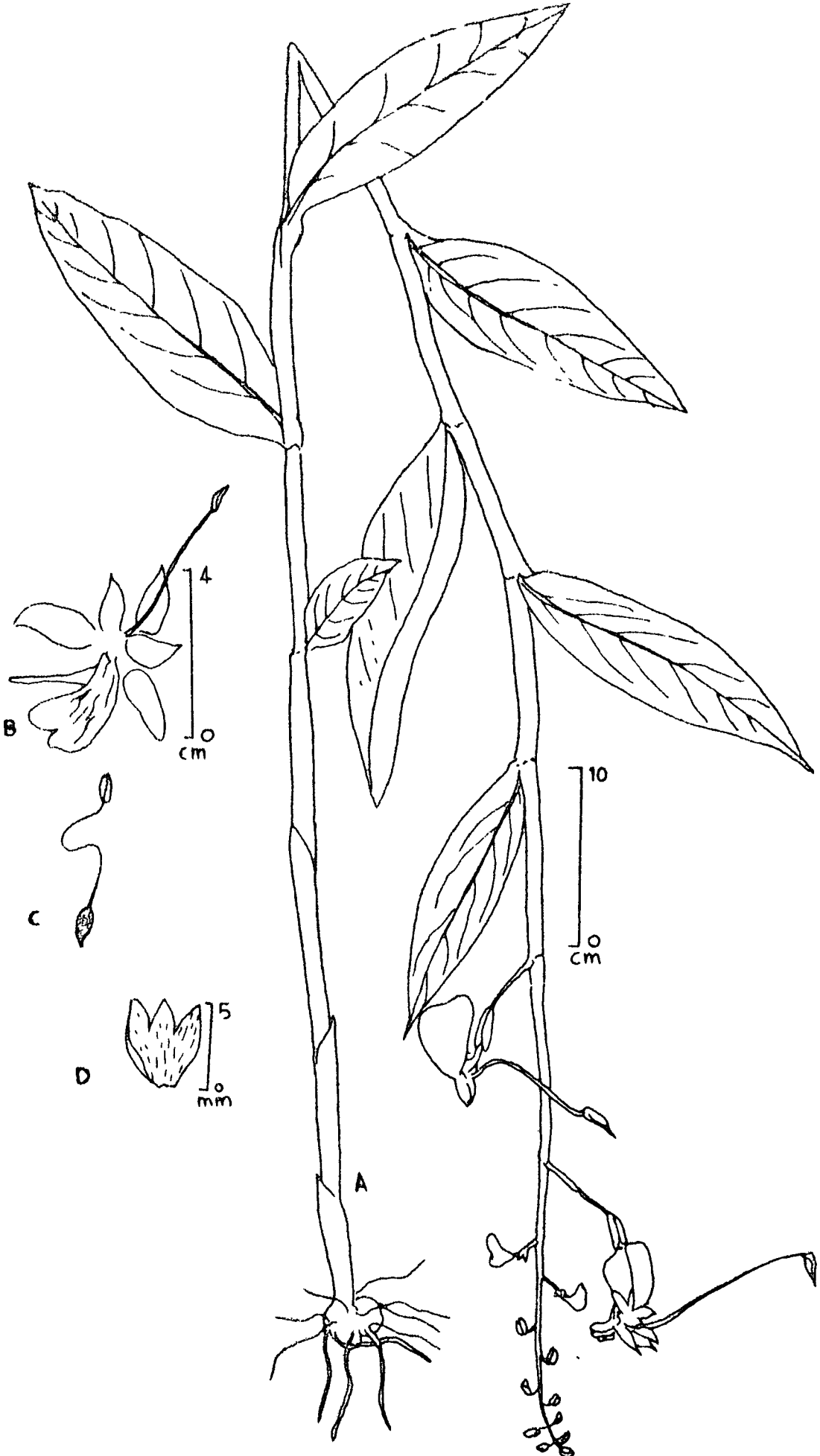


Plate 113 Globba clarkei Baker A.Habit, B.Flower (disected), C.Pistil, D.Calyx.

Rhizomes 0. Stems 40-100 cm high. Leaves linear, 8-20 x 3-4 cm, apex caudate. Sheaths hairy near the mouth. Ligules very short, truncate, hairy. Spikes 10-30 cm long, flowers lax, frequently transformed into deciduous bulbils. Calyx tube about 5 mm long, 3-lobed or toothed; corolla tube shorter than the calyx tube; segment about 1.5 cm long, acute, pale violet; staminodes as long as, or longer than the segments; lip much longer than the segments, 2-lobed, yellow; filaments long, filiform, much longer than the lip; anthers cuneate; styles passing through the filament. Fruits oblong, obscurely 3-lobed, about 2 cm long.

Common in forests along the banks of streams, rivulets, etc.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1128 Laitkor (Khasi Hills).

Globba multiflora Wall. ex Baker in Hook.f. Fl. Brit. India 6: 202. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 118. 1972.

Leafy stems erect, 1-1.5 m high. Leaves 20-25 x 5-8 cm, pubescent beneath, apex caudate, base cuneate, or rounded; petioles short, about 5 mm long, sheaths striate, hairy on the margins. Ligules truncate, 3 mm long, hairy. Spikes 15-30 cm long, lower branches 3-6-flowered; upper ones 1-2 flowered. Rhachis and branchlets very hairy. Bracts 6-8 mm long. Calyx tube short, 3-5 mm long, pale brown; corolla tube 1-1.2 cm long, dark yellow; segments ovate, 4 mm long; filaments 1 cm long; anthers sagittate, as long as the anthers; ovary 1-celled; styles filiform, in the groove of the filament. Capsules 1 cm across.

Common in dense forests, especially along the banks of streams, rivulets, etc. Also on the moss covered rocks in wet places.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1152 Shillong; 1797 Pariong (Khasi Hills).

Globba racemosa Smith Exot. Bot. 2: 115. t. 117. 1804; Baker in Hook.f. Fl. Brit. India 6: 201. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 118. 1972.

Roots fibrous, 1 mm across, very hairy. Leafy stems 1-1.5 m high, weak. Leaves 10-20 x 2-4 cm, caudate at apex, base cuneate, glabrous or hairy beneath, specially on the ribs towards the base. Petioles 3-4 mm long; sheaths hairy on the margin: ligules short, truncate, very hairy. Spikes 15-25 cm long, flowers lax, in the lower portion and dense towards the terminal portion in the spike. Bracts caducous. Calyx tube 2 mm long, shortly lobed; corolla tube 6 mm long, bright yellow; filaments longer than the corolla segments; ovary 1-celled; styles filiform, placed in the groove of the filament. Capsules up to 1 cm long, smooth.

Common along the banks of the rivulets, streams and on wet rocks in dense forests; associated with many herbaceous plants.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1728 Burnihat (Khasi Hills).

Hedychium Koenig

Perennial, rhizomatous herbs often epiphytic. Roots stout. Leafy stems annual, never branched, invariably covered by leaf-sheaths. Leaves cauline, sessile, sometimes shortly petioled, oblong or linear-lanceolate, glabrous or pubescent beneath. Ligules generally brownish or reddish, closely adhering to the stems, membranous. Spikes terminal, lax or dense-flowered . Bracts conspicuous, spirally arranged on the rachis. Flowers very showy, bracteoles minute, membranous. Calyx tubular, 3-toothed; corolla tube long, segments 3; lateral staminodes petaloid; lip clawed or not, 2-fid, emarginate or entire; stamen 1, filaments long; anthers crested or spurred. Ovary small, 3-celled, hairy, many ovuled; styles long, passing inbetween the anther lobes; stigma ciliate. Capsules globose or trigonous. Seeds arilate.

K E Y T O S P E C I E S

1a. Filaments not more than 1 cm long; shorter than the lip.
  2a. Flowers 0.8-1.5 cm long.
    3a. Spikes lax, rhachis distinctly visible; bracts convolute.
      4a. Bracts 1-flowered; lip oblong, cuneate, orange-red at the base; staminodes almost linear.
        5a. Stamens shorter than the lip; filament curved . . spicatum
        5b. Stamens longer than the lip; filament straight . . . . griffithianum

4b. Bracts many-flowered; lip suborbicular, clawed, yellow at base; staminodes oblong-obovate . . . . . dekianum

3b. Spikes dense, rhachis not visible; bracts not convolute.

6a. Bracts reddish-brown; lip obovate, cuneate . . . . . marginatum

6b. Bracts green; lip suborbicular, clawed.

7a. Flowers orange-yellow with orange-red blotch at the mouth; stamens shorter than the lip . . . . . elwesii

7b. Flowers white or yellow with a yellow blotch at the mouth, or if orange-yellow at the mouth, then the stamens longer than the lip. . . . . coronarium

2b. Flowers 2-3 cm long . . . . . aureum

1b. Filaments more than 1 cm long, longer than the lip.

8a. Anthers 1.5-2 mm long, cells diverging at the base.

9a. Flowers large; corolla lobes 3-4 cm long; lip 3-3.5 cm long; filaments 6 cm long . . . . . villosum

9b. Flowers small; corolla lobes 1.5 cm long; lip 1 cm long; filaments 4 cm long . . . . . tenuiflorum

8b. Anthers 0.5-1.2 cm long, cells parallel.

10a. Flowers red or orange-red.

11a. Leaves linear; filaments more than twice the length of lip.

12a. Leaves pubescent beneath . . . coccineum var. longifolium

12b. Leaves glabrous . . . . . coccineum var. squarrosum

11b. Leaves lanceolate; less than twice the length of the lip.

13a. Rhachis and bracts villous; bract purplish-green; corolla tube as long as bract . . . rubrum

13b. Rhachis and bracts glabrous; bracts green; corolla tube much longer than the bracts . . . . . aurantiacum

10b. Flowers white or yellow.

14a. Lips 3-5 mm across.

15a. Spikes dense, rhachis not visible; bracts flat, imbricating; lip and staminodes 2.5-3 cm long; filaments up to 6 cm long . . ellipticum

15b. Spikes lax, rhachis visible; bracts convolute; lip and staminodes less than 2 cm long; filaments 2.5-3.5 cm long.

16a. Corolla tubes 0.5-1 cm longer than the bracts; filaments red; staminodes linear . . . . . gracile

16b. Corolla tubes 3 cm longer than the bracts; filaments white; staminodes spathulate . . . gracillimum

14b. Lips 1-3 cm across.

17a. Leaves white pulverulent beneath; flowers bright yellow; filament red; lip entire or notched . . . . . gardnerianum

17b. Leaves appressed hairy beneath; flowers white or yellowish; lip distinctly bilobed, the sinus up to 1 cm deep.

18a. Flowers pale yellow; lip up to 3 cm across . . . . . luteum

18b. Flowers white; lip 1-2 cm across.

19a. Corolla tube 3 cm longer than the bracts; staminodes spathulate; filament 3 cm long . . . . . calcaratum

19b. Corolla tubes exceeding the bracts by 1-1.5 cm; staminodes linear; filaments 5-6 cm long.

20a. Spikes 10-20 cm long; bracts 1-rarely 2-flowered, lower 1-2 empty, flat, the rest

flowering, convolute . . .... thyrsiforme

20b. Spikes 40-60 cm long; bracts 2-4-flowered, all flowering and convolute . . . . stenopetalum

Hedychium aurantiacum Wall. ex Rosc. Monandr. Pl. t. 39. 1828; Baker in Hook.f. Fl. Brit. India 6: 232. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 134. 1972.

Stems 50-80 cm high. Leaves lanceolate, acute, 30-50 x 4-8 cm. Spikes 15-30 cm long, lax-flowered; bracts 3 cm long, convolute, 2-flowered. Flowers orange-yellow with a deep orange-red blotch in the mouth; calyx 2.5 cm long, sparsely hairy; corolla tube 4.5-5.5 cm long, exceeding the bracts by 1-1.5 cm long, lobes 2.5 cm long; staminodes narrowly oblanceolate, 3 mm across; lip suborbicular, clawed, 3 x 2 cm, 2-lobed, sinus 1 cm deep; stamens 1.5 cm longer than the lip; filament 3.5 cm long, yellow, anthers 1 cm long.

Frequent in forests.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 2960 Mawphlang (Khasi Hills).

Hedychium aureum Cl. et Mann ex Baker in Hook.f. Fl. Brit. India 6: 229. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 71. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 131. 1972.

Rhizomes small, green. Stems 40-80 cm high. Leaves 15-20 x 2-3 cm, very thin, gradually tapering to the acute apex, base

rounded or cuneate. Petioles 0.5-1 cm long; ligules membranous, 2-3 mm long. Spikes 4-6 x 2-3 cm, dense-flowered; bracts linear, 1-1.5 x 0.5 cm; calyx tube slightly longer than the bracts; corolla tubes 1.5-2 cm long, lobes 1 cm long; staminodes 1 x 0.2 cm; lip 8 mm long, shallowly 2-fid, clawed, yellow; filaments longer than the lip; anthers slightly spurred at the base; styles passing through the filament and anther cells, stigmas hairy.

Common in dense forests, on rocks and also on tree trunks.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 2947 Shillong (Khasi Hills).

Hedychium calcaratum Rao & Verma in Bull. bot. Surv. India 11: 120. 1971 et 14(1-4): 133. 1972.

Stems 90 cm high. Leaves 20-30 x 3- 5 cm, appressed white hairy beneath. Spikes 8-10 cm long, lax flowered; bracts 3-4 x 1 cm, 1-flowered. Flowers white; calyx 0.5-1 cm longer than the bracts; corolla tubes 5.5-6 cm long, lobes 3 cm long; staminodes spathulate, 1.5 x 0.5 cm; lip obovate, clawed, 2 x 1.5 cm, bilobed, sinus 1 cm deep; filaments 3 .2 cm long, anthers 1 cm long, styles passing through the anther cells, stigma hairy.

Rare, once reported from Badarpur road.

Fls. & Frts. July to September.

Specimens examined: Deka 10124 Badarpur road (Jaintia Hills). (ASSAM).

Hedychium coccineum Buch.-Ham. ex Smith in Rees. Cyclop. 17: 5. 1811; var. longifolium (Rosc.) Baker in Hook.f. Fl. Brit. India 6: 231. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 71. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 133. 1972.

Vern.-'Tiewshynrai' (K) 'Synta-syin' (J).

Rhizomes short, thick. Stems 1-2 m high, tufted. Leaves 40-50 x 5-15 cm, pubescent beneath, lanceolate, apex pointed, ligules rounded, brown, glabrous, 1-2 cm long. Spikes 20-40 cm long, dense-flowered. Bracts 4-5 cm long, convolute, 2-3-flowered; calyx 2-3 cm, long, split on one side, membranous, white; corolla tube longer than the bracts, lobes 4 x 0.2-0.3 cm, acuminate, convolute; lip suborbicular, 4 x 3.5 cm, clawed, bilobed, sinus up to 1 cm deep; staminodes spathulate, 3 x 1 cm; filaments longer than the lip, anthers 1 cm long; styles passing through the anther cells, stigma capitate, hairy. Capsules ellipsoid, 2.5 cm long.

Common in forests and in ditches, often grown in gardens for their beautiful orange-red flowers.

Fls. & Frts. : July to August.

Specimens examined: Myrthong 2951 Sunapahar (Khasi Hills).

var. squarrosum Buch.-Ham. ex Wall. in Hook. Kew Journ. Bot. 5: 372. 1853; Baker in Hook.f. Fl. Brit. India 6: 231. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 133. 1972.

Stems 1 m high. Leaves 25-40 x 2-3 cm, glabrous. Flowers bright crimson.

Common in marshes and in forests along the banks of streams, etc.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 2902 Songsak (Garo Hills); 2950 Sunapahar (Khasi Hills).

Hedychium coronarium Koenig in Retz. Obs. 3: 73. 1783; Baker in Fl. Brit. India 6: 225. 1892; Rao & Verma in Bull. bot. Surv. India 11: 121. 1971; et in 14(1-4): 128. 1972.

Rhizomes thick, white inside. Young buds pink. Roots fibrous, tufted. Stems erect, fleshy, 1-2 m high. Leaves 25-40 x 3-10 cm lanceolate, acute, hairy beneath. Spikes 5-20 cm long, with moderately dense flowers. Bracts 3 x 2 cm, ovate, green with white membranous edges. Calyx tube shorter than bracts; corolla tube protruding out from the bracts; petals white; lateral staminodes 4-5 x 1 cm; lip equalling the staminode, narrowed towards the claw, lobed; lobes rounded; filaments fleshy, red; anthers about 1 cm, long. Capsules globose, few seeded. Seeds ovoid, about 5 mm across, with red aril.

Common under pine forests, associated with herbaceous plants, occasionally cultivated in gardens for their white fragrant flowers.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1033, 2901 Shillong (Khasi Hills); 1937 Tura (Garo Hills); 3096 Jowai (Jaintia Hills).

Hedychium dekianum Rao & Verma in Bull. bot. Surv. India 11: 122. 1971 et in 14(1-4): 129. 1972.

Stems 1-2 m high, Leaves 30-50 x 5-15 cm, glabrous, coriaceous, sometimes with brown margin, acute at the apex, base with brown margins specially near the sheaths. Spikes 10- 20 cm long, moderately dense-flowered; rhachis villous; bracts 4-6 cm long convolute, 3-9-flowered. Flowers white, fragrant; calyx as long as bracts; corolla tube much longer than the bracts, lobes 3-4.5 cm long; staminodes spathulate, 2.5-4 x 1-1.5 cm, white; lip suborbicular, clawed, 3-4.5 x 2-3.5 cm, white with pale yellow blotch at the mouth, distinctly 2-fid. Stamens 1-2 cm longer than the lip, filaments 3-4.5 cm long, anthers 1 cm long. Capsules oblong-cylindric, trigonous.

Frequent in forests, associated with other herbaceous plants.

Fls. & Frts.: July to September.

Specimens examined: Myrthong 2957 Woodland garden, Shillong (Khasi Hills).

Hedychium ellipticum Buch.-Ham. ex Smith in Res. Cyclop. 17: 2. 1811; Baker in Hook.f. Fl. Brit. India 6: 228. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 131. 1972.

Rhizomes thick, prostrate. Stems 40-60 x 0.5-1 cm. Leaves sessile, 20-25 x 3-6 cm, oblong or lanceolate, acute, glabrous beneath. Ligules oblique, truncate, rounded, sometimes 2-lobed. Spikes short, dense flowered. Bracts green, linear, about 2 cm long. Calyx tube equal to bracts; corolla tube 6 cm long or more, linear; corolla segments 2 cm long; staminodes shorter than the segment; lip oblong with distinct claw; stamens long; filaments filiform, twice the length of the lip; anthers yellow, linear; stigma protruding out from the anther cells. Capsules subglobose, 1 cm across.

Common in pine forests as well as in broad leaved forests.

Fls. & Frts.: June to October.

Specimens examined: Myrthong 1763 Rynjah (Shillong).

Hedychium elwesii Baker in Hook.f. Fl. Brit. India 6: 226. 1892; Rao & Verma in Bull. bot. Surv. India 11: 123. 1971 et in 14(1-4): 129. 1972.

Rhizomes thick. Roots fibrous, tufted. Leafy stems 1-2 m high, clothed with leafsheaths. Leaves 30-36 x 5-10 cm, lanceolate, glabrous or hairy near the midrib; ligules 1 cm long, rounded, membranous. Spikes few-flowered. Bracts fewer and lax, 5-6 x 2 cm, oblong, lanceolate, acute with brown membranous edges. Calyx tube shorter than the bracts and remains concealed within it; corolla tube linear, 2 cm long, exserted out from the bracts; corolla segments 3 cm long, yellow, notched at the apex; lip large 4 cm across, narrowed into a broad claw, 2-lobed; filaments 1.8 cm long; anthers linear, 1 cm long, embracing the pistil.

Common in shady areas, especially along the banks of rivers, streams, etc., and also cultivated in gardens for their beautiful yellow flowers.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1061, 3029 Shillong.

Hedychium gardnerianum Rosc. Pl. Monandr. Scit. Pl. t. 62. 1828; Baker in Hook.f. Fl. Brit. India 6: 230. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 71. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 133. 1972.

Rhizomes thick. Stems erect, solitary, fleshy, 1-2 m x 2-3 cm. Leaves 40-50 x 10-15 cm, ovate-lanceolate, acuminate, pubescent beneath or sometimes glabrous; petioles very short, 0.5-1 cm long; ligules ovate-oblong, rounded up to 4 cm long. Spikes 15-40 x 5-10 cm, dense-flowered. Bracts oblong, 5 x 2 cm, rolled tightly around the flowers. Calyx tube shorter than the bracts; corolla tube longer than bracts; petals reflexed, 2-3 cm long;

staminodes shorter than petals; lip as long as the staminodes, narrowed gradually towards the claw; filaments red, longer than petals; anthers linear, 1 cm long. Fruits a 3-valved capsule, few-seeded (6-8). Seeds ovoid with crimson aril.

Common in forests along the banks of streams, rivers etc.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1333, 3066 Shillong.

Hedychium gracile Roxb. Fl. Ind. 1: 14. 1820; Baker in Hook. f. Fl. Brit. India 6: 229. 1892; Rao & Verma in Bull. bot. Surv. India 11: 123. 1971 et in 14(1-4): 132. 1972.

Rhizomes prostrate, jointed, covered with scaly leaves. Stems erect, 40 cm high or more. Leaves 15-25 x 4-6 cm , lanceolate, pointed at both ends; ligules membranous, brown red. Bracts 2 x 0.4 cm, brown or straw-coloured. Calyx tube longer than bracts, completely enclosing the corolla tube, about 3 cm long; corolla tube longer than calyx; corolla segments emerging, linear 1.4 cm long; staminodes shorter than the segments; lip distinctly clawed, about 1 cm long; filaments 2-3 cm long; anthers linear, about 8 mm long; style passing through the staminal column; stigma turbinate.

Common in pine forests and on moss covered rocks.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1034 Shillong; 3048 Mawphlang (Khasi Hills).

Hedychium gracillimum Rao & Verma in Bull. bot. Surv. India 11: 124. 1971, et in 14(1-4): 132. 1972.

Stems 25-60 cm high. Leaves subsessile or with short petioles, glabrous, 10-20 x 2-5 cm. Bracts 1-1.5 x 0.3-0.5 cm convolute, 1-flowered. Flowers white or yellowish in age; calyx 1-1.8 cm long, longer than the bracts; corolla tube 3-4 cm long, lobes 2-3 cm long; staminodes spathulate, 1.5 x 0.2-0.4 cm, lip oblong, clawed, 1.5 x 0.5 cm, deeply bilobed, sinus up to 3 cm deep; filaments 3 cm long, whitish, anthers 1 cm long, orange-red.

Rare, in foothills, specially in forest margins.

Fls. & Frts. : May to August.

Specimens examined: Myrthong 1034 Cherapunjee; Deka 23085 Cherapunjee (ASSAM).

Hedychium griffithianum Wall. in Kew Journ. 5: 369. 1853; Rao & Verma in Bull. bot. Surv. India 11: 125. 1971 et in 14(1-4): 132. 1972.

Vern.- 'Shynraikhla' (K).

Rhizomes thick, with hairy roots. Stems 0.5-1 m high, Leaves lanceolate, 15-40 x 5 cm, glabrous or hairy along the midrib beneath. Spikes erect, 10-20 cm long; bracts 1.5-3 cm long, convolute, 1-flowered. Flowers white becoming yellowish at maturity, mouth reddish, sparsely glandular, fragrant; calyx 2-4 cm long; corolla tubes 3-5 cm long, lobes 3-4 cm long; staminodes linear to narrowly oblanceolate, 3-4.5 x 0.4-0.8 cm; lip oblanceolate, cuneate, as long as staminodes but broader, deeply 2-lobed, sinus up to 1.5 cm deep; stamens pink or red, much longer than the lip; filaments 3-4 cm long. Capsules subglobose, with reflexed valves at maturity.

Common in pine forests, associated with other forest undergrowth.

Fls. & Frts. August to October.

Specimens examined: Myrthong 2990 Kyrdemkulai (Khasi Hills).

Hedychium greenii Smith and Hedychium hookeri Cl. ex Baker have also been reported from the area of study (Rao & Verma 1971, 1972) based on earlier collections deposited in the ASSAM Herbarium but not encountered in the present study.

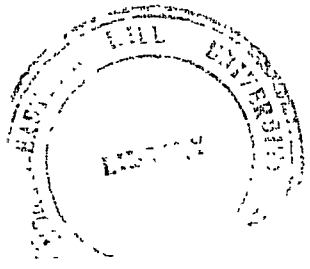
Hedychium luteum Baker in Hook.f. Fl. Brit. India 6: 232. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 134. 1972.

Stems 1 m high. Leaves 30-40 x 8-10 cm, hairy beneath. Spikes 10-12 cm long, lax-flowered; bracts 5 cm long, convolute, many-flowered. Flowers pale yellow; calyx 3 cm long, hispidulous with tuft of hairs at the tips; corolla tube 6 cm long, lobes shorter than the tube; staminodes lanceolate, 4 x 0.8 cm, petaloid; lip orbicular, clawed, 3.2 x 3.2 cm, bilobed, sinus 1 cm deep; filaments longer than the lip, anthers 1.5 cm long.

Frequent in forests, as forest undergrowth.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2959 Nongpoh (Khasi Hills).



Hedychium marginatum Cl. in Journ. Linn. Soc. 25: 75. t. 31. 1890; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 72. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 129. 1972.

Vern.-'Tiewsyingkhla' (K).

Stems up to 1.5 m high. Leaves lanceolate, 20-40 x 3-6 cm villous beneath, upper surface hairy at the base only, apex finely acuminate, base narrowed to a short petiole, ligule membranous, truncate or rounded, brown at maturity. Spikes cone-like, 6-10 cm long, erect; bracts oblong, flat, 4-4.5 cm long, membranous on margin, 2-3-flowered. Flowers yellow, turning orange-red when dry; calyx 2 cm long, white, fleshy; corolla tube 4.5-5 cm long, lobes 2.5 cm long, yellow, staminodes oblanceolate, 2 x 0.2 cm; lip obovate, cuneate, 2 x 1 cm, 2-fid; stamens 2.5 cm long, filaments 1.5 cm long.

Occasional, in forests and often cultivated in gardens for their yellow, fragrant flowers.

Fls. & Frts. : July to October.

Specimens examined: Bor 15626 Khasi Hills (ASSAM).

Hedychium rubrum Rao & Verma in Bull. bot. Surv. India 11: 127. 1971, et in 14(1-4): 133. 1972.

Stems 0.5-1.2 m high. Leaves 20-30 x 3-6 cm, hairy beneath, along the midrib, purplish when young. Spikes 6-15 cm long, dense-flowered; bracts 3.5-4.8 x 2 cm, purplish-green, hairy, 2-flowered, fibrous at the tips. Flowers red; calyx 2.5-3 cm long, corolla tubes equalling the bracts, lobes linear, 4 cm long; staminodes spathulate, 3 x 0.8 cm; lips suborbicular, abruptly clawed, broader than long, bilobed; filaments up to 5 cm long, anthers 1 cm long; styles passing through the anther cells, stigma capitate, peeping out from the anther tip. Capsules subglobose, 2 cm long, pinkish-red.

Rare, im forest associated with other herbaceous plants.

Fls. & Frts. : July to September.

Specimens examined: Verma 34599 Woodland Garden Shillong.

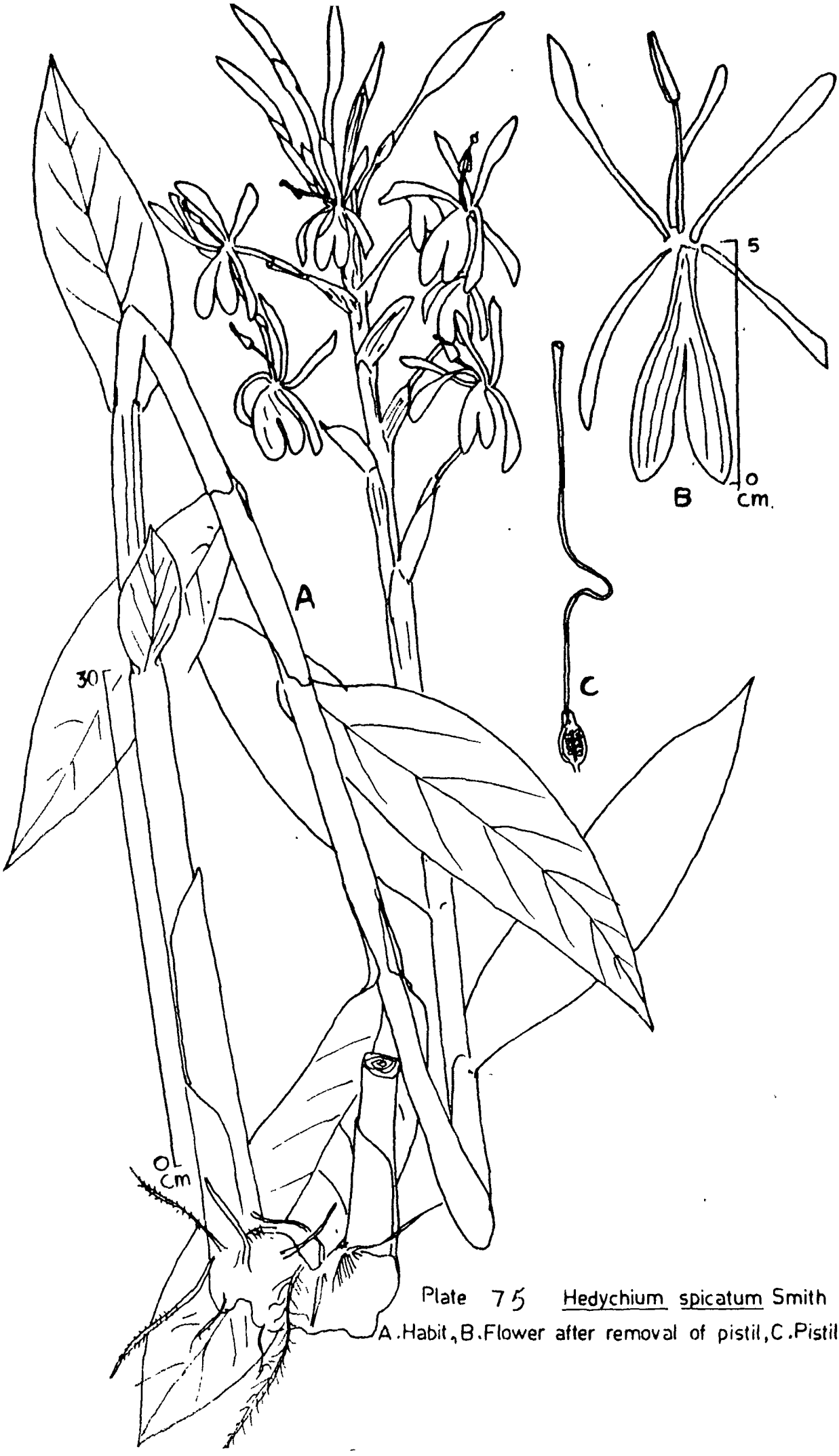


Plate 75 Hedychium spicatum Smith

A. Habit, B. Flower after removal of pistil, C. Pistil.

Hedychium spicatum Buch -Ham. ex Smith in Res. Cyclop. 17: n. 3. 1811; Baker in Hook.f. Fl. Brit. India 6: 227. 1892. (Plate 75).

Vern.-' Sying-kala' (K).

Rhizomes prostrate. Roots fibrous. Leafy stems 1-2 m high, clothed with leafsheaths. Leaves 30-40 x 5-8 cm, oblong, acute, base cuneate, apex acuminate. Ligule membranous, 2 cm long. Spikes 15-30 cm long. Bracts 2 cm long. Calyx tube shorter than the bracts; corolla tube much longer than the bracts; segments 4-5 cm long, linear; staminodes equalling the corolla segments, lanceolate; lip broad, 5 cm long, 2-lobed, deeply cut; filaments filiform, pale red, shorter than the corolla segments; anthers cuneate, 2-celled, pale red or reddish at the edges; style passing through the anther cells; stigma exserted from the anther cells, globose. Capsules subglobose, glabrous, 3-valved, deep red, valves roll when open.

Common in forests and in the edges of the forests, specially on banks of streams, etc.

Fls. & Frts. : June to December.

Specimens examined: Lyrthong 2945 Sumapahar (West Khasi Hills).

Hedychium stenopetalum Lodd. Bot. Cab. t. 1902. 1833; Baker in Hook.f. Fl. Brit. India 6: 231. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 72. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 133. 1972.

Tall plants. Rhizomes thick, greenish-white inside. Leafy stems 2-4 m high, clothed with leafsheaths. Leaves 40-50 x 10-15 cm,

lanceolate, apex acuminate, glabrous or pubescent beneath, base cuneate; petiole short or absent, equalling the ligule; ligule ovate, acute, 2 x 2 cm, membranous. Spikes 30-35 cm long, flowers lax or moderately dense. Rachis stout, pubescent. Bracts 3-5 x 2-3 cm, rigid, green, glabrous, not rolled up, apex rounded, membranous. Calyx tube shorter than bracts; corolla tube longer than bracts; staminodes shorter than corolla tube; corolla white; lip 2-fid, lobes acute, with distinct claw; stamens 4 cm long; anthers 5-8 mm long, linear, crested; style long, passing through the anther cells; stigma ciliate. Capsules oblong-cylindric, 3 cm long.

Common in forests, in association with ferns and other shrubby plants.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 3292 Shillong; 2947 Sunapahar (West Khasi Hills).

Hedychium tenuiflorum (Wall. ex Baker) Schum. in Engl. Pflanzenrch. heft 20: 51. 1904; Rao & Verma in Bull. bot. Surv. India 14(1-4): 131. 1972. - - H. villosum var. tenuiflorum Wall. ex Baker in Hook.f. Fl. Brit. India 6: 229. 1892.

Rhizomes thick, prostrate, white. Stems erect, fleshy, brown, 1-1.5 m high. Leaves 20-35 x 4-8 cm, linear, acute, glabrous beneath. Ligules 0.5-1 cm long, membranous. Spikes 30 cm long, curved. Bracts oblong, 2 cm long or more, enclosing the calyx tube; calyx tube 3 cm long, oblong; corolla tube 3-4 cm long, linear; petals oblong, 2 cm long; staminodes as long as the petals; lip broad, 2-lobed, about 2 cm long, oblique lanceolate, deeply cut; filaments

filiform, red, anthers 1 mm long; pistil passing through the groove of the filament; stigma globose, hairy.

Common on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1776 Shillong Peak.

Hedychium thyrsiforme Buch. Ham. ex Smith in Rees Cyclop. 17. 1811; Baker in Hook.f. Fl. Brit. India 6: 230. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 72, 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 132. 1972.

Stems 2-3 m high. Leaves lanceolate, oblong, 30-60 x 8-12 cm, pubescent beneath, apex acute, base rounded. Spikes 10-20 cm long, dense-flowered. Bracts 3-4 cm long, lower ones empty, upper convolute, 1-2-flowered. Flowers white, fragrant; calyx as long as the bracts; corolla tube 1-1.5 cm longer than the bracts, lobes 3-4 cm long; staminodes linear, 2-2.5 cm long; lip obovate, clawed, 2-2.5 x 1-1.5 cm, with yellow blotch at the base, deeply lobed, lobes acute; filaments very long, 5-6 cm long, white, anthers up to 1 cm long, reddish.

Common in forests, commonly associated with forest undergrowth, usually gregarious.

Fls. & Frts. August to October.

Specimens examined: Myrthong 3048 Tura Peak (Garo Hills).

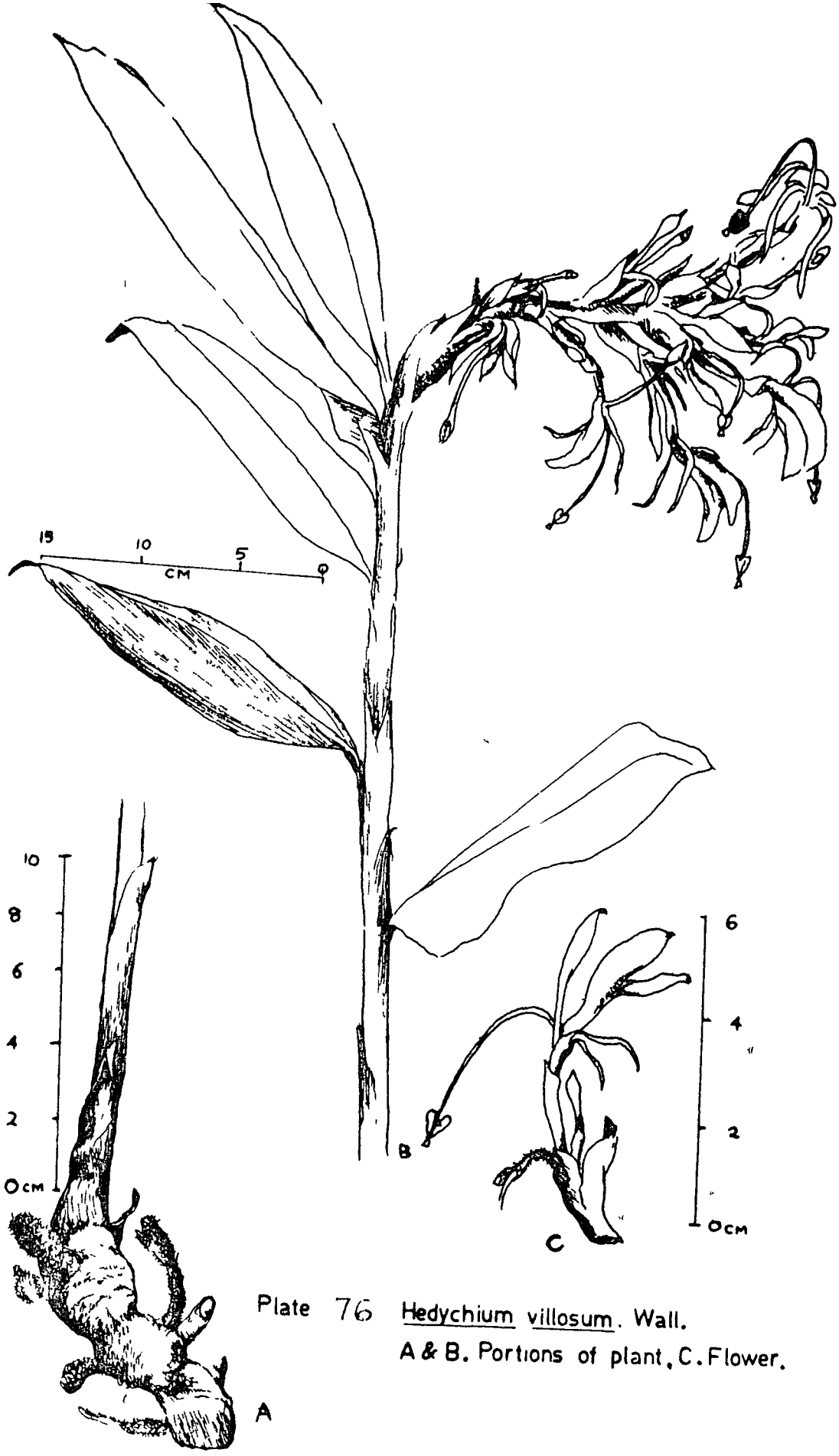


Plate 76 Hedychium villosum. Wall.
A & B. Portions of plant, C. Flower.

Hedychium villosum Wall. in Roxb. Fl. Ind. 1: 12. 1832; Baker in Hook.f. Fl. Brit. India 6: 228. 1892; Naik & Panigrahi in Bull. bot. Surv. India 3(1): 72. 1961; Rao & Verma in Bull. bot. Surv. India 14(1-4): 131. 1972 (Plate 76).

Vern.-'Shynrai-khla' (K).

Rhizomes thick, prostrate, entangling, with thick hairy roots. Leafy stems fleshy, 1-2 m high, base clothed with brown scales. Leaves 20-30 x 3-6 cm, lanceolate or oblong-lanceolate, acuminate, subsessile. Ligule membranous, rounded. Spikes 20 cm long. Bracts 2-3 cm long, hairy enclosing 2-3 flowers; flowers white; calyx tube 3-4 cm long; corolla tube longer than the calyx tube, small; lobes 3-4 cm long; staminodes as long as corolla lobes, petaloid; lip 2 cm long; filaments 3.8 cm long, filiform; style passing through the anther cells.

Common in forests on tree trunks and also on rocks, in shrubby places.

Fls. & Frts. : January to March.

Specimens examined: Myrthong 1493 Umroi, 2948 Sunapahar (Khasi Hills).

Hemiorchis Kurz

Hemiorchis rhodorrhachis Schum. in Engl. Pflanzenrch. heft 20: 128. 1904; Rao & Verma in Bull. bot. Surv. India 14(1-4): 119. 1972.

Rhizomes 5-10 mm thick, creeping. Leaves oblong-lanceolate, 15-20 x 4-6 cm, produced after flowers. Peduncles with inflorescence 10-20 cm high, clothed with reddish, oblong, hairy sheaths; Flowers condensed on rhachis; calyx 1 cm long, hairy; corolla tubes as long as calyx,,lobes 1.5 cm long; staminodes obovate-oblong, shorter than corolla lobes, yellowish white; lip ovate, as long as corolla lobes, yellowish white with brown dots. Filaments about 5 mm long; anthers equalling the filaments, apiculate. Ovary 1-celled, hairy; capsules 3-valved.

Rare, once reported from Thuria (Khasi Hills), on rock in dense forest.

Fls. & Frts. : January to April.

Specimens examined: Deka 16436 Tharia (Khasi Hills) (ASSAM).

Hitchenia Wall.

Hitchenia careyana Benth. in B. & H. Gen. Pl. 3: 643. 1834; Baker in Hook.f. Fl. Brit. India 6: 225. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 125. 1972.

Stems stout, 1-2 m high, clothed with sheaths. Leaves 40-60 x 10-15 cm, oblong-lanceolate, glabrous,hairy only along the midrib beneath. Spikes terminal, dense-flowered, 10-20 cm long; bracts oblong, obtuse, with recurved tips, lowers bracts tomentose, greenish, the rest glabrous, white with pale green in the middle, 3-6-flowered. Calyx cylindric 1 cm long, 3-lobed,

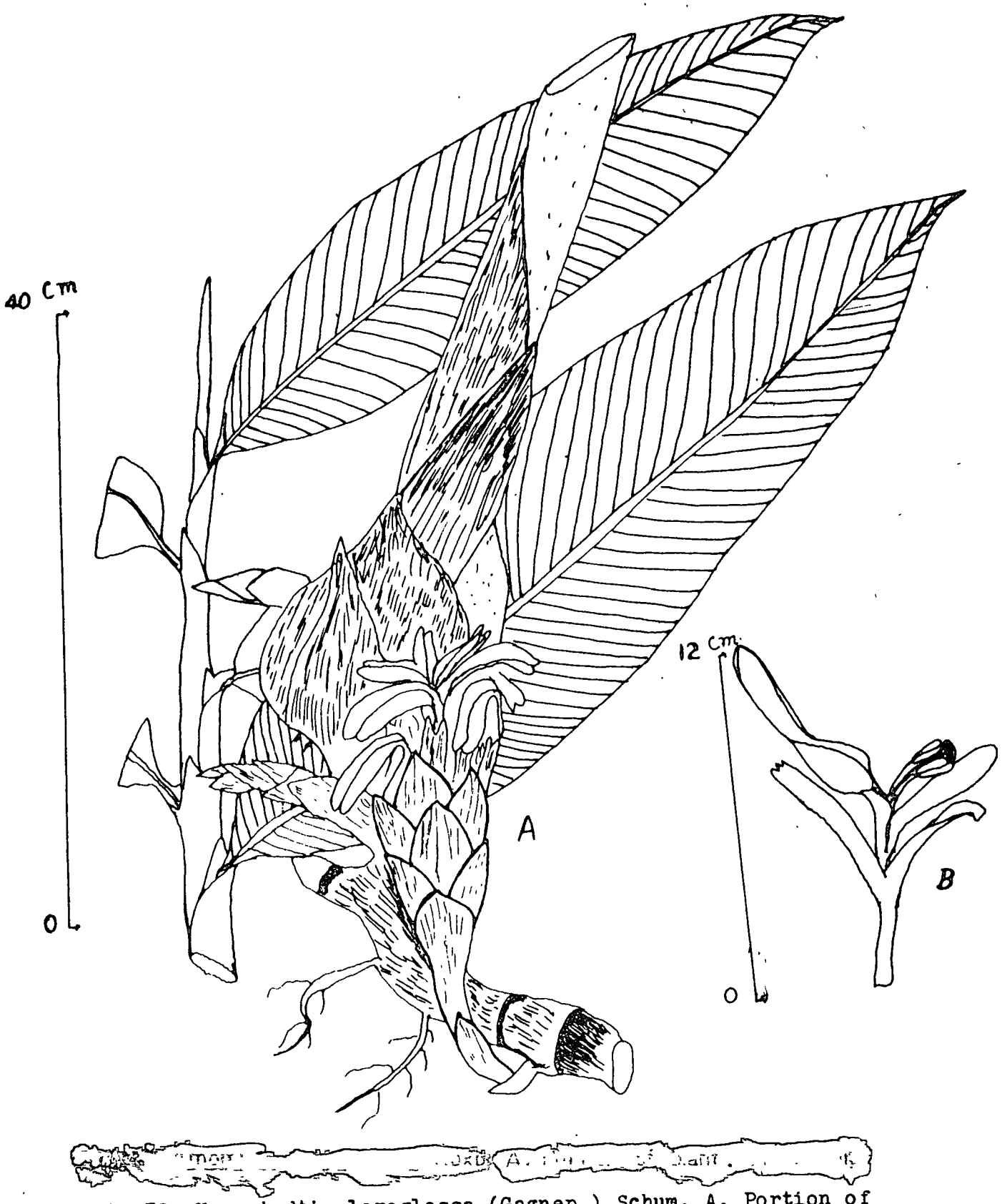


Plate 72. Hornstedtia loroglossa (Gagnep.) Schum. A. Portion of plant, B. Flower.

corolla white, tube as long as bracts, lobes 1-1.5 cm long; staminodes petaloid, small; lip oblanceolate, 3-lobed, notched at the tip, 2 x 0.5 cm, white, yellowish at the base; filaments as long as or longer than the lip; anthers 5 mm long. Capsules oblong, 1.5-2 cm long.

Rare, once collected only from Jaintiapur.

Fls. & Frts. : October to November.

Specimens examined: RaO 20004 Jaintiapur (Jaintia Hills) (ASSAM).

Hornstedtia Retz.

Hornstedtia loroglossa (Gagnep.) Schum. in Engl. Pflanzenrch. heft 20: 196. 1904; Rao & Verma in Bull. bot. Surv. India 11: 247. 1971, et in 14(1-4): 136. 1972. - - Amomum loroglossum Gagnep. in Bull. Soc. Bot. Fr. 49: 258. 1902. **(Plate 72).**

Rhizomes creeping. Stems 2 m high. Leaves lanceolate 50 x 12 cm, glabrous. Spikes ellipsoid, 5-10 cm long, on short peduncles; bracts closely imbricating. Flowers red. Calyx tubular, split on one side; corolla tubes up to 4 cm long, lobes lanceolate, 2-3 x 0.5-1 cm; lip ligulate, 6 x 1.5 cm, yellow with bright red band in middle; filaments 1.2 cm long, adnate to the lip; stigmas red.

Rare, once collected only at Baghmara, in deep forest.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3140 Baghmara (Garo Hills).

Kaempferia Linn.

Rhizomes short, creeping. Roots stout, ending in ovoid tubers. Stem 0. Leaves radical, sometimes produced after flowers. Inflorescence various. Calyx tubular, persistent; corolla tube as long as the calyx tube or much longer; lobes equal, spreading; staminodes petaloid, broad, resembling the lip; lip ovate, 2-lobed; stamens 1, filaments short or obsolete; connective broad, produced above into an entire or variously lobed anther crest. Ovary 3-celled; style long, filiform; stigma turbinate. Capsules oblong. Seeds subglobose with small lacerate aril.

K E Y T O S P E C I E S

1a. Flowers within a partially adnate pair of large oblong bracts, forming a cupular involucre . . . . . involucrata

1b. Flowers without such cupular bracts. . . . . rotunda

Kaempferia involucrata King. ex Baker in Hook.f. Fl. Brit. India 6: 221. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 124. 1972.

Rhizomes small, scaly. Stems 0. Leaves petioled; blade linear, acute, 10-15 x 1-2 cm, base narrowed. Peduncles 2-4 cm long. Spikes 4-6 x 1-2 cm. Bracts membranous, green, about 3 cm long, persistent. Calyx 1 cm long; corolla 2 cm long, whitish pink; outer segments white, inner ones variegated; staminodes oblong; lip 1 cm long, 2-lobed, with yellow spot on the midlobe. Ovary 3-celled; style filiform, stigma turbinate.

Rare, in warmer parts of Meghalaya, in sal and teak plantation.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 1993 Tasak (Garo Hills).

Kaempferia rotunda Linn. Sp.Pl. 3. 1753; Baker in Hook.f. Fl. Brit. India 6: 222. 1890; Rao & Verma in Bull. bot. Surv. India 14(1-4): 123. 1972.

Rhizomes tuberous. Roots fibrous, sometimes with large tubers at the ends of the slender roots. Stems 0. Leaves 20-30 x 6-8 cm, erect, tinged with brown purple beneath; petioles short channelled. Peduncles 3-5 cm long, clothed with scarious scales. Spikes 4-8-flowered, produced before the leaves. Bracts oblong, outer 4-5 cm long; inner 5-6 cm long, linear. Calyx tube about 6 cm long, finely toothed; corolla as long as the calyx tube; segments deflexed; staminodes slightly shorter than the corolla tube; lip shorter than the staminodes, deeply 2-lobed, reflexed, red purple or lilac; anthers crested, 2-celled.

Rare; recorded on hill slopes in warmer areas,and under the betel nut plantations.

Fls. & Frts.: April to August.

Specimens examined: Myrthong 1651 Lamin (Jaintia Hills).

Roscoea Smith

Roscoea purpurea Smith Exot. Bot. 2: 97. t. 108. 1804; Baker in Hook.f. Fl. Brit. India 6: 207. 1890; Hara Fl. East. Himal. 423. 1966; Rao & Verma in Bull. bot. Surv. India 14(1-4): 119. 1972 (Plate 77).

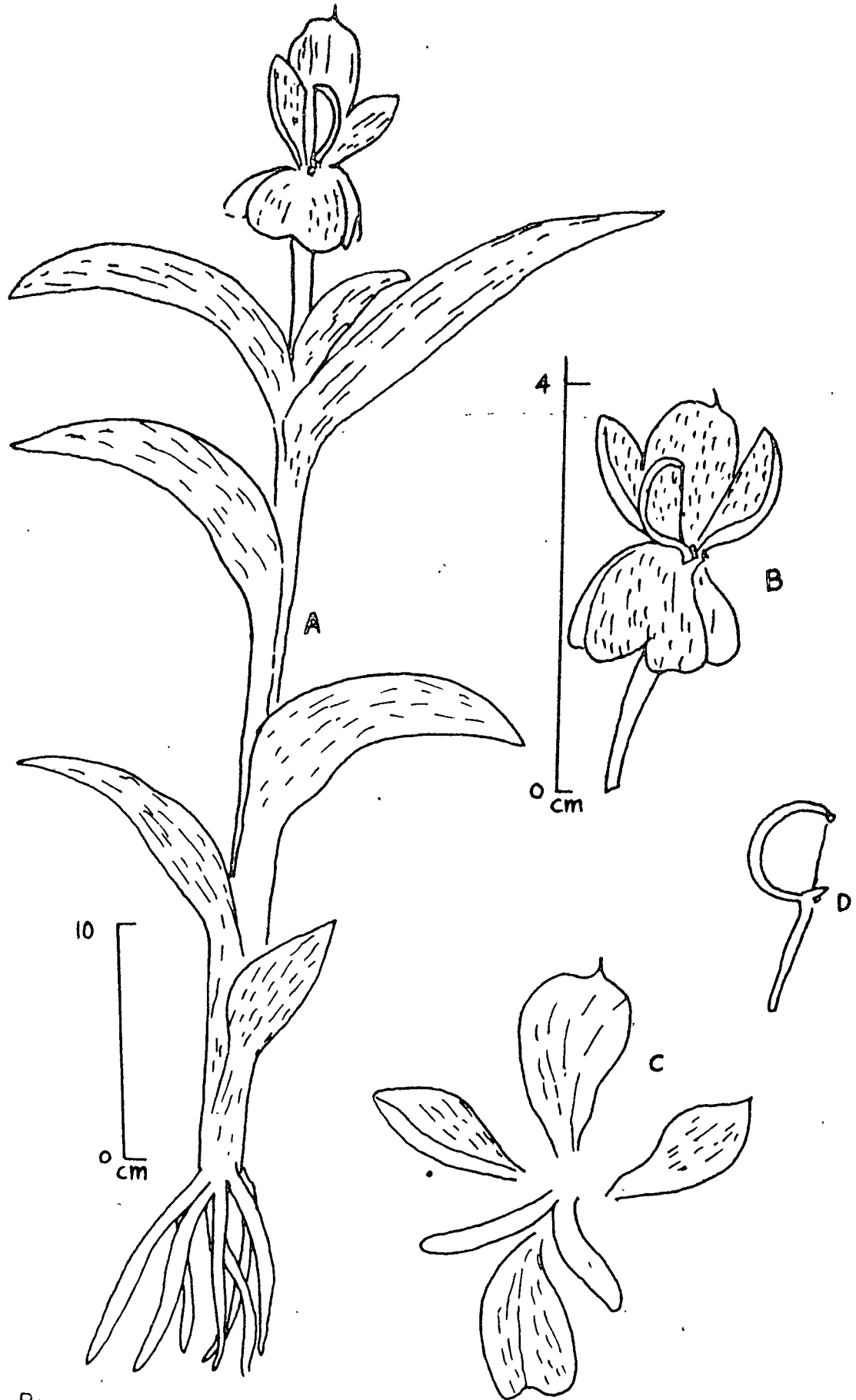


Plate 7 / Roscoea purpurea Smith A. Habit, B. Flower, C. Perianth, D. Stamen enclosing the Pistil.

Roots fleshy, white. Stems leafy, 30-40 cm high, completely clothed with leafsheaths. Leaves 12-15 x 2-4 cm, sessile, base sheathing, apex obtuse. Ligules short, membranous. Spikes terminal, few-flowered. Bracts hidden in the terminal leafsheaths. Calyx green, imbricate; corolla tube, dilated upwards; staminodes oblanceolate, shorter than upper petal; stamens as long as the staminode, curved; anthers tailed; lip about 2 cm across, deflexed, shortly 2-lobed, lobe rounded; style passing through the anther cells; stigma with a thread-like connective. Capsules cylindric, 2-3 cm long.

Common in open areas, in association with grasses, on slopes of hills.

Fls. & Frt.: August to October.

Specimens examined: Lyrthong 3028 Shillong.

Zingiber Adans.

Perennial, rhizomatous herbs. Leaves oblong-lanceolate. Spikes usually radical on separate scapes or sometimes terminal on leafy stems. Bracts densely imbricate, 1-flowered. Calyx cylindric, or spathaceous, shortly 3-lobed; corolla tube as long as the bracts lobes lanceolate; upper ones concave. Stamen 1, filaments short; anther cells contiguous; connective beaked. Ovary 3-celled; ovules many; styles slender, passing in between the 2-anther cells; stigma funnel-shaped, ciliate. Capsules cylindric, globose or ellipsoid. Seeds large, globose, arilate.

K E Y T O S P E C I E S

1a. Spikes terminal. . . . . capitatum
1b. Spikes radical. Lodal.
  2a. Flowering peduncles up to 3 cm long.
    3a. Bracts green; lip bright yellow, unspotted. . . . . chrysanthum
    3b. Bracts red; lip yellowish white, spotted and streaked with yellow and red purple. . . rubens
  2b. Flowering peduncles 10-30 cm long.
    4a. Leaves oblong; ligules 1-2.5 cm long; spikes globose or ovoid, rounded at the top. . . . . zerumbet
    4b. Leaves lanceolate; ligules 1-2 mm long; spikes ovoid, acute at the top. . . . . cassumunar

Zingiber capitatum Roxb. As. Res. 11: 346. 1810; Baker in Hook.f. Fl. Brit. India 6: 248. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 138. 1972; Babu Herb. Fl. Dehra Dun 503. 1977.

Rhizomes short. Roots with tubers. Leafy stems 50-120 cm high. Leaves sessile, 20-40 x 2-4 cm, linear, or linear-lanceolate, glabrous, acute. Ligule 2-4 mm long, expanding, ciliate. Spikes terminal, on leafy stems, 5-20 x 4-6 cm, with dense flowers. Bracts elliptic, lanceolate, 3-4 x 1-2 cm, hairy without, upper bracts narrower. Calyx tube pubescent, 3-lobed, shorter than bracts; corolla tube as long as the bracts; segments yellow; lip yellow, midlobe orbicular, emarginate, base auricled, obtuse, red. Anthers yellow. Capsules bright red, 2 cm long. Seeds black, shining with aril.

Rare; occurs in shrubby areas in association with tall grasses.

Fls. & Frts. : August to October.

Specimens examined: Lyrthong 2946 Sunapahar (Khasi Hills).

Zingiber cassumunar Roxb. in As. Res. 11: 347. t. 5. 1810; Baker in Hook.f. Fl. Brit. India 6: 248. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 137. 1972.

Rhizomes prostrate, thick, deep yellow inside. Leafy stems 90-120 cm high, clothed with leafsheaths. Leaves 30-40 x 3-5 cm, oblong, lanceolate, acute, pubescent beneath, sheaths very hairy. Peduncles 30 cm long, parallel to the stems, covered with leafy bracts which are scarious and orbicular. Spikes elliptic, about 10 x 6 cm, bracts orbicular, pale red, outer bracts up to 6 cm long, inner ones broader with orbicular apex. Flowers protruding out from the orbicular bracts; corolla tube whitish yellow, as long as the bracts; segments 2 cm long; upper ones concave; lip 1.5 cm long. Stamens whitish-yellow, shorter than the lip; filaments shorter than the lip; anther cells crested; stigma subglobose.

Common in bamboo forests, in warmer areas.

Fls. & Frts. : August to December.

Specimens examined: Lyrthong 3081 Nongpoh (Khasi Hills).

Zingiber chrysanthum Rosc. Scit. Pl. t. 86. 1828; Baker in Hook.f. Fl. Brit. India 6: 243. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 136. 1972.

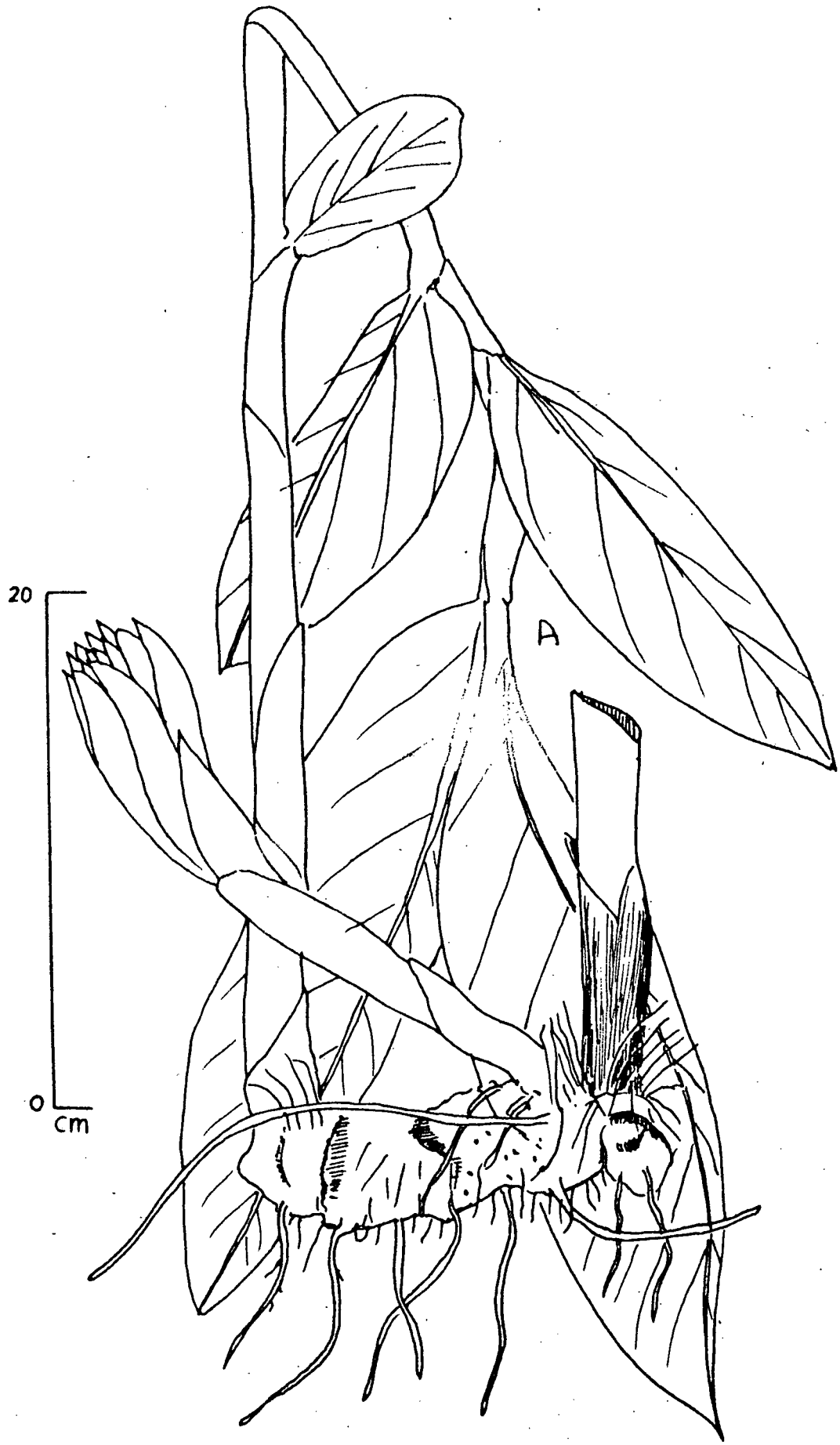


Plate 78 Zingiber rubens Roxb., A. Habit

Rhizomes prostrate. Leafy stems about 30-40 cm high. Leaves 30-40 x 6-10 cm, lanceolate, glabrous, apex acute, base rounded,or cuneate; petioles 10-15 cm long, sheathing at the base; ligule 5 mm long, 2-lobed. Peduncles very short. Spikes 6 cm long, oblong, densely flowered. Bracts orbicular, spreading upwards. Corolla tube 2-4 cm long; segments pinkish white; lip obtuse; stamens as long as the lip, arched over it; anthers linear, beaked, beak equalling the anther. Capsules red, covered with pink, fleshy sheaths.

Common in pine forest and also in open places among grasses.

Fls. & Frts.: August to October.

Specimens examined: Myrthong 1347 Shillong; Kharkongor 808 Lailad (Khasi Hills).

Zingiber rubens Roxb. As. Res. 11: 348. 1810; Baker in Hook.f. Fl. Brit. India 6: 243. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 137. 1972; Babu Herb. Fl. Dehra Dun 505. 1977 (Plate 78).

Rhizomes thick, fleshy with tufted roots. Stems 60-80 x 1-1.5 cm, clothed with membranous leafsheaths. Leaves 35-45 x 8-10 cm, pubescent beneath, apex acute,base cuneate; petioles 0. Ligules 1-1.5 cm long, memoranous. Spikes radical, 5-8 x 4-6 cm, spreading above. Peduncles as long as or shorter than the spikes. Leafy bracts 4-6 cm long, cymbiform; floral bracts linear, as long as the leafy bracts, narrower, 5-8 mm across, acute, purplish violet. Corolla tube as long as the bracts; segments shorter, linear, deep red; lip as long as the corolla segments,mottled with purple dots.. Anthers linear, deep red, with beaked tip; styles filiform, stigma subglobose. Seeds globose, arilate.

Common in edges of forest, sometimes on rocks covered with soil.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3293 Nongpoh(Khasi Hills).

Zingiber zecumbet Smith Exot. Bot. 2: 105. t. 112. 1804; Baker in Hook.f. Fl. Brit. India 6: 247. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 137. 1972.

Rhizomes prostrate. Leafy stems erect, 0.5-1.2 m high. Leaves 10-30 x 4-8 cm, lanceolate, glabrous. Peduncles 10-25 cm long, covered with leafy bracts. Spikes elliptic, 6-10 x 4 cm. Bracts orbicular, green, basal bracts longer than the upper ones. Flowers protruding out from the bracts. Corolla tube as long as the bracts; segments about 2 cm long, yellow; lip lobed, 1.5 cm across. Stamens as long as the lip; filaments passing through the anther cells, penicellate. Capsules oblong, 2 cm long, white. Seeds 6 mm long, black.

Common undergrowth in forest specially in warmer parts; and also in bamboo and sal forests.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1961 Way to Baghmara (Garo Hills); 3080 Nongpoh. (Khasi Hills).

Costaceae

Nakai 1941.

Herbs with leafy stems. Rootstocks tuberous, horizontal. Leaves spirally arranged on fleshy jointed scape, sheaths closed. Flowers in dense globose or ovoid, terminal heads or sometimes on separate scape arising direct from the rhizomes; bracts persistent, spirally arranged. Calyx 3-lobed; corolla subequal; stamen 1, connective forming an oblong, petaloid process with contiguous, linear anther cells; lip large, obovate, with incurved margins; ovary 3-celled; ovules many, superposed; placentas axile; style filiform with a crescent or cup-shaped stigma. Fruit a globose or ovoid capsule opening on one side between the ribs. Seeds obovoid or subglobose, arilate.

Costus Linn.

Costus speciosus (Koenig ex Retz.) Smith in Trans. Linn. Soc. 1: 249. 1791; Baker in Hook.f. Fl. Brit. India 6: 249. 1892; Hara Fl. East. Himal. 421. 1966; Rao & Verma in Bull. bot. Surv. India 14(1-4): 138. 1972; Babu Herb. Fl. Dehra Dun 500. 1977. - Banksia speciosa Koenig ex Retz. Obs. Bot. 3: 75, 1783.

Erect herbs. Stems up to 3 m high, jointed. Rootstock rhizomatous, horizontal. Leaves spirally arranged, subsessile, glabrous above, 20-30 x 5-10 cm, acute, narrowed towards the short sessile base, with rounded sheaths. Inflorescence a terminal, dense spike. Bracts ovate, acuminate, striated, retuse on one side,

red, 3-4 x 2.5 cm; bracteoles also red, lanceolate, 1-2 cm long; sepals 1.5-3.5 cm long, glabrous, 2 posterior lobes ovate, apiculate, large up to 6 x 3.5 cm, recurved or waved margin, white; lip funnel-shaped, with brown red, hairy throat; staminodes 0; filaments 3-4 cm long, with a tuft of hairs at the base of the filament; connective petaloid, pubescent, produced into a glabrous appendage, as long as the linear anther-cells; styles 4-5 cm long, slender; stigma with a semilunar, ciliated mouth. Capsules globose, 3-gonous, red. Seeds black with white aril.

Common in all types of forests including the jhum fallows. Locally the plants are used in native medicine.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1150 Shillong (Khasi Hills); 1926 Way to Tura Peak (Garo Hills).

Cannaceae

A. L. de Juss. Gen. Pl. 62. 1789.

Perennial, rhizomatous herbs with leafy stems. Leaves alternate. Inflorescence a simple or branched terminal raceme. Flowers bisexual, irregular, bracteate; sepals 3, subequal, herbaceous, persistent, fleshy; petals 3, bright red or reddish yellow, shorter than the petaloid staminodes; staminodes petaloid; fertile stamen 1, with anther attached on one side of the petaloid structure. Styles fleshy, flat, longer than the petaloid stamens; ovary inferior, 3-locular; stigma oblique. Fruit a loculicidal, capsule. Seeds large, globose.

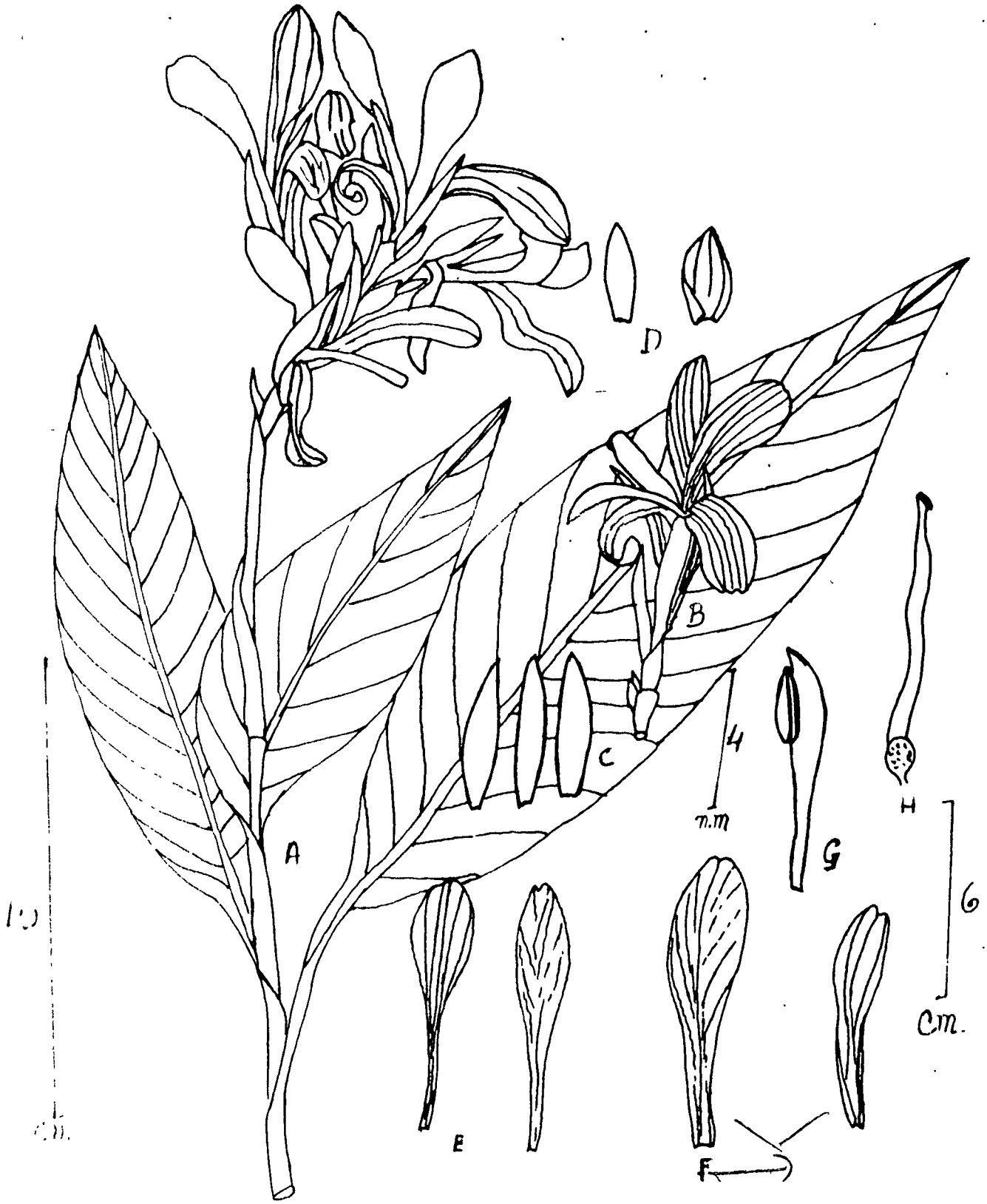


Plate 74 Canna indica Linn.. A.A portion of stem, B.Flower, C.Bracts, D.Sepals, E.Petals, F.Staminodes, G.Fertile stamen, H.Pistil.

Canna Linn.

Canna indica Linn. Sp. Pl. 1. 1753; Baker in Hook.f. Fl. Brit. India 6: 260. 1892 (Plate 79).

Rootstock perennial. Leafy stems erect, 1-1.5 m high. Leaves alternate, ovate-lanceolate, acute, 20-40 x 10-16 cm, base narrowed abruptly into a petiole; ligule 0. Flowers bisexual; sepals 3-4 x 1 cm, brownish green, acute; petals yellow or pinkish red, 5 cm long, subequal, spathulate, variable; staminodes modified into petaloid structures, longer than the petals, one staminode reduced into fleshy shield-shaped structure; stamen 1; anther 1-celled, attached on one side of the petaloid stamen; style flat, slightly twisted with oblique stigma. Ovary inferior, 3-locular, 1-ovuled in each locule. Capsule warty.

Grown in gardens as an ornamental herb.

Fls. & Frts. : Major part of the year.

Specimens examined: Myrthong 1185 Shillong; 1739 Burnihat (Khasi Hills).

Marantaceae

Lindl. Nat. Syst. 267. 1830.

Herbs or shrubs with creeping or tuberous rootstock, rarely with underground stems. Leaves large, oblong, radical with pulvinus-like swellings on the stalk; blade differentiated into sheath, petiole and lamina. Flowers irregular, epigynous often in pairs at the axil of bracts; perianth 6, in 2-series; sepals 3, imbricate

petals 3, connate in a tubular, lobed corolla, the posterior sometimes concave; stamens 3, 1 or 2 reduced to petaloid staminodes; of the inner whorl the posterior stamen only bearing the anther with petaloid filament; other two represented by petaloid staminodes Ovary inferior, 3 or 1-celled. Seeds arilate.

Phrynium Willd.

Perennials. Leaves radical, long petioled, peduncular leaves similar to the radical leaves . Flowers condensed in capitate or globose heads, at the axils of spirally arranged bracts; corolla lobes oblong, subequal, staminodes 4, 2 outer and 2 inner; stamens 1. Ovary 3-celled. Capsules 3-seeded or sometimes 1-2-seeded; seeds ellipsoid, grooved.

K E Y T O S P E C I E S

1a. Bract apices fibrously splitting . . pubinerve

1b. Bract apices acute not splitting . . . . . parviflorum

Phrynium parviflorum Roxb. Fl. Ind. 1: 17. 1820; Baker in Hook.f. Fl. Brit. India 6: 259. 1892; Rao & Verma in Bull. bot. Surv. India 14(1-4): 141. 1972.

Leaves lanceolate, oblong or ovate-oblong 30-60 x 5-25 cm, cuspidate, glabrous; petioles very long, up to 80 cm long, peduncular leaves similar to the radical leaves, peduncles shorter than petioles. Spikes capitate; bracts [illegible] splitting, [illegible]

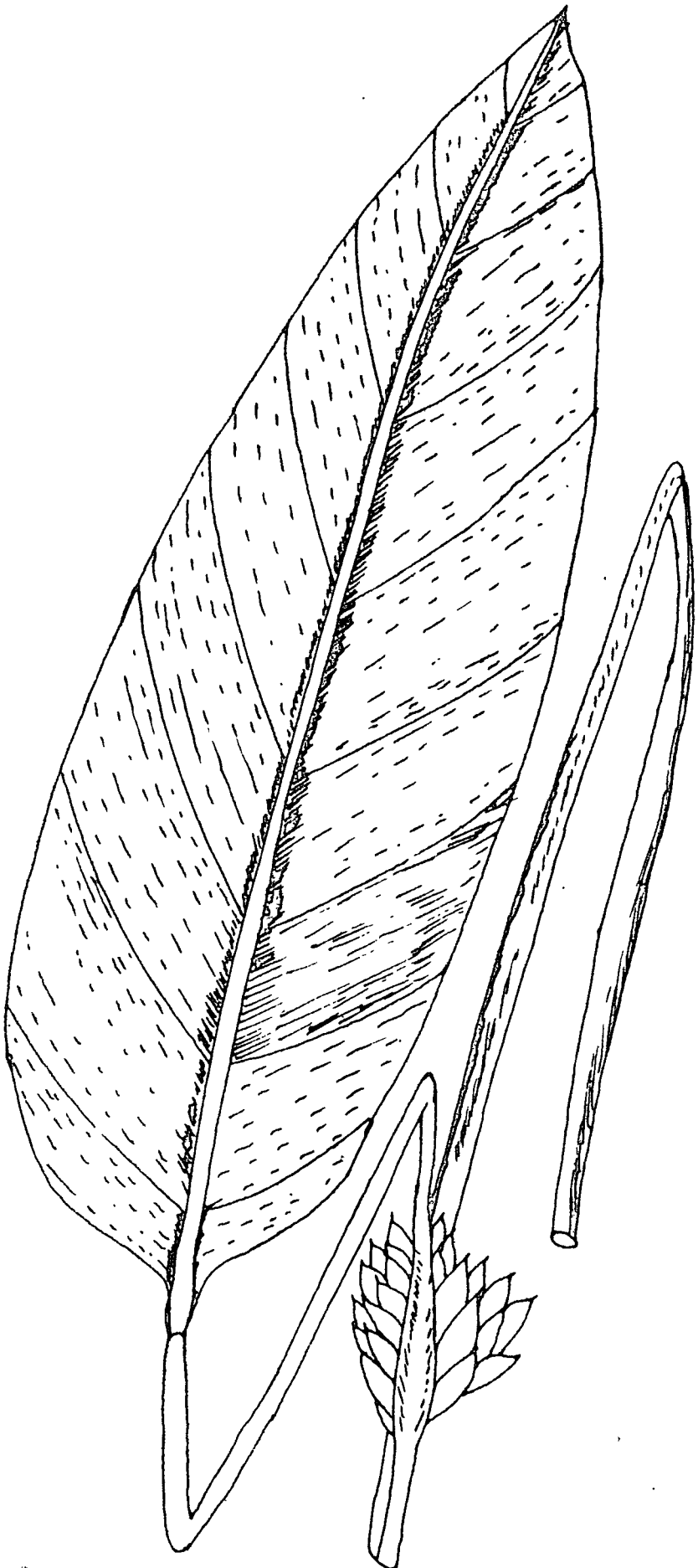


Plate 80 Phrynium pubinerve Bl. A. A leafy bract with capitate inflorescence.

Sepals 5-7 mm long, white; corolla 1 cm long; staminal tube 2 mm long, outer staminodes 5 mm long, orange-yellow. Capsules ellipsoid, 1.5-2 cm long, reddish-brown.

Common in forests, as forest undergrowth.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 2960 Shella (Khasi Hills).

Phrynium pubinerve Bl. Enum. Pl. Java 38. 1827; Rao & Verma in Bull. bot. Surv. India 14(1-4): 141. 1972. - - P. capitatum Willd. Sp. Pl. 1. 1797; Baker in Hook.f. Fl. Brit. India 6: 258. 1892 (Plate 80).

Vern.- ' Slasongdoh ' (K).

Perennial, leafy herbs. Rootstock tuberous covered with fleshy rootfibres. Leaves radical; petioles 1 m high; blade ovate-lanceolate, 30*18 cm, acute, base rounded or cuneate; midrib slender, lateral nerves distinct; base sheathing. Inflorescence a capitate spike, 2-4 cm across. Outer bracts 2-3 at the base of the spike , large, with incurved fibrous tip. Sepals linear, hairy; corolla about 2 cm long, funnel-shaped above, yellowish purple, recurved at the hairy tip. Staminal column 5-lobed; outer 2-lobed larger, one orbicular, concave; filament adnate to the inner segments; anthers small; style adnate to lower portion of the staminal tube, hooked above; stigma capitate; ovary 3-celled, hairy. Fruits globose, 1 cm long, 3-locular. Seeds 8 x 5 mm, black.

Common in all types of forests, especially in the deep, shady forests forming ground vegetation. The leaves are used for

rapping meats, betel leaves, and others.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1216 Cherrapunjee (Khasi Hills); 1977 Baghmara (Garo Hills).

A R E C I D A E

ARECALES

Arecaceae

C. H. Schultz.-Schulzenstein Nat. Syst. Pflanzenr. 317. 1832 nom cons. (Palmae Juss. Gen. 37. 1789. nom alt.).

Shrubs or trees. Stems erect, scandent or decumbent, rarely branched above, often covered with scars of fallen leaves or with persistent leaf bases. Leaves alternate, usually crowded at the terminal portion of trunk, pinnatisect or palmate, petioles sheathing. Flowers uni-or bisexual, in branched spikes or panicles, enclosed by large sheathing spathes; perianth 6, persistent, in 2-series, tough, leathery, sepaloid; segments free or occasionally connate, imbricate or valvate. Stamens 3-6, or more, adnate to the base of the perianth tube, opposite to the perianth segments; filaments subulate or filiform; anthers versatile, 2-celled; ovary 1-3; stigmas 3, sessile; ovules 1 in each cell. Fruit a berry or drupe. Seeds erect, rarely pendulous; albumen horny or bony. Embryo small at one end of the cavity near the surface of the albumen.

K E Y T O G E N E R A

1a. Plants scandent or climbing; fruits covered with shining, closely adpressed, imbricating scales.

2a. Spathes tubular, persistent. . . . Calamus

2b. Spathes cymbiform or open, deciduous. . . . . Daemonorops

1b. Plants erect; fruits without scales.

3a. Leaves orbicular.

4a. Spadices on long, scape-like peduncles exceeding the leaves; spadices few on each node of the peduncle, embraced at the base by the scurfy spathes. . . . . Licuala

4b. Spadices compound, spreading, without distinct peduncles; branched above.

5a. Leaf segments with filiform drooping apices. . . . . Livistona

5b. Leaf segments rigid, not drooping. . . . . Trachycarpus

3b. Leaves pinnatisect, elongate.

6a. Leaflets with induplicate sides. . Phoenix

6b. Leaflets free with reduplicate sides.

7a. Ovules basilar.

8a. Male flowers usually 1, on each side of the female along the spadix . . . . . Pinanga

8b. Male flowers 2-nate or solitary towards the tip of the spadix. . Areca

7b. Ovules parietal.

9a. Fruits large, 10-20 cm long, 10-15 cm across.

10a. Leaves flabelliform; spathes numerous, sheathing; pericarps thin, fleshy. . . . . Borassus

10b. Leaves pinnatisect; spathes 2; pericarps thick, fibrous. . . Cocos

9b. Fruits small, 0.5-2 cm long, 0.3-1 cm across.

11a. Leaflets obliquely dimidiately flabelliform, uniformly green . . . Caryota

11b. Leaflets obliquely oblong, usually white beneath. . . . . Wallichiana

Areca Linn.

Stems slender, annulated. Leaves pinnate, upper leaf segments often connate. Spadices interfoliar, branched. Flowers monoecious; spathes 3 or more, caducous. Male flowers minute, compressed or 3-quetrous; stamens 3-6; female flowers large, at the base of the branches; ovary 1-celled; ovule basal, erect; stigmas 3, sessile. Drupes ovoid or oblong, fibrous. Endosperm ruminate.

K E Y T O S P E C I E S

1a. Stems up to 10-20 m high; drupes ovoid or ellipsoid, 3 cm across. . . . catachu

1b. Stems up to 3-6 m high; drupes fusiform, 1 cm across. . . . . triandra

Areca catachu Linn. Sp. Pl. 1189. 1753; Beccari & Hook.f. Fl. Brit. India 6: 405. 1892.

Vern.-' Kwai ' (K).

Trunks erect, up to 20 m high, slender, unbranched. Leaves

1-2 m long, crowded at the apex of the stems. Leaflets numerous; upper confluent, glabrous with distinct costae. Rachis slender. Leafbase sheathing, very tough, leathery, white, smooth within and green without, cymbiform, as long as the internodes, embracing the stem, base truncate. Spadices much branched, pendulous. Male flowers 5 mm long, acute; sepals minute, 1 mm long, connate at the base of the corolla tube; petals 3, 5 mm long, acute; stamens 6, filaments short; anthers 2-celled; pistillode reduced. Female flowers solitary at the base of the branches, 1.5 cm long; sepals 3, cymbiform, imbricating; petals 3, cymbiform, smaller than sepals; staminodes 6. Drupes 2-3 x 2-3 cm, globose or ellipsoid, deep orange-yellow at maturity. Seeds 1, rarely 2, covered with firous tissue.

Cultivated for its drupes.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1635 Sohkha (Jaintia Hills).

Areca triandra Roxb. Hort. Beng. 68. 1814; Beccari & Hook. f. Fl. Brit. India 6: 407. 1892.

Vern.-' Kwai-sohlaper ' (K).

Stems slender, 4-6 m high, annulated. Leaves similar to that of A. catachu. Spadices large, much branched, spreading or erect. Male flowers small; sepals 3, connate at the base of corolla tube; petals 3, 2-3 mm long, cuneate; stamens 6, filaments short; anthers shorter than the petals, 2-celled; pistillode reduced. Female flowers larger, 8 mm long; sepals and petals similar to that of males; staminodes 6. Drupes fusiform,or elongate,2 cm long.

Cultivated in warmer parts of Meghalaya, for its drupes.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 2964 Punursla (Khasi Hills).

Calamus Linn.

Erect or scandent, prickly. Leaves alternate, pinnatisect; leaflets acuminate; rachis often produced to an armed flagellum. Spathes tubular or open, persistent, sheathing the peduncle or branches of the spadix and passing into bracts and bracteoles. Flowers small, polygamo-dioecious, usually distichous, often scorpioid. Male flowers: calyx 4, cupular; petals 3, acute, coriaceous, valvate. Stamens 6; filaments short; anthers dorsifixed. Female flowers: calyx 3, cupular; petals 3, tubular below, 3-toothed, valvate. Staminodes connate in a cup; ovary incompletely 3-celled, cloth.d with r trorse scales; styles short or long; stigmas 3; ovules basilar, erect. Fruits globose, or ellipsoid covered with shining scales. Pericarps thin. Seeds smooth or pitted.

K E Y T O S P E C I E S

1a. Stems erect, stout; margin of leaflets remotely ciliolate; petioles and rachis armed with whorls of spines. . . . . erectus

1b. Stems scandent; margin of leaflets serrulate or spinulate; spines on petioles not whorled. . . . . floribundus

Calamus erectus Roxb. Fl. Ind. 3: 774. 1832; Beccari & Hook.f. Fl. Brit. India 6: 438. 1892.

Vern.-' Sohthri ' (K).

Stems 3-6 m high, with spines on the joints. Spines up to 2 cm long, sharp, verticellate, slightly pointed downwards. Leaves up to 5 m long; petioles stem-like, with spines at the joints. Leaflets opposite or alternate, 40 x 3-4 cm, margin ciliolate, especially towards the apex. Inflorescence a branched panicle, Spathes cymbiform, acute. Flowers sessile, alternately arranged on the rachis at the axil of the bracts. Sepals 3, connate; petals 3, equalling the sepals and alternating with them; stamens 6, adnate to petals; filaments short, anthers cuneate, longer than the filaments. Styles short; ovary 1-celled. Fruits elliptic, subtended by spreading perianth and trapezoid scales.

Common in dense forests.

Fls. & Frts.: August to February.

Specimens examined: Myrthong 3263 Trongpleng (Khasi Hills).

Calamus floribundus Griff. in Calc. Journ. Nat. Hist. 5: 56. 1845; Beccari & Hook.f. Fl. Brit. India 6: 444. 1892.

Vern.-' Thri ' (K).

Stems tufted, armed with sharp recurved spines. Leaves 80-100 x 30-50 cm; leaflets 20-35 x 2-3 cm, equidistant, uppermost leaflet connate, margin serrulate or spinulate, obscurely nerved, costae armed with few spines. Rachis and petiole armed with short setae and spines. Spadix elongate, decompound; internodal spathes

ciliate, truncate. Spikes short, spreading, recurved, distichous, 0.6-10 cm long, flagellum with recurved spines. Flowers usually dense, becoming distichous at fruiting stage. Sepals 3, 1 mm long; petals 3, 2 mm long, brown; styles short; stigmas sessile. Fruits 1-seeded capsules, with overlapping pale brown scales.

Common in forests especially along the rivulets and in wet areas.

Fls. & Frts.: June to October.

Specimens examined: Myrthong 1683 Umling (Khasi Hills); 3176 Garumpani (Jaintia Hills).

Caryota Linn.

Caryota urens Linn. Sp. Pl. 1189. 1753; Beccari & Hook.f. Fl. Brit. India 6: 422. 1892.

Vern.-' Diengtlai-ja' (K).

Tall unarmed palms, 10-20 m high, 30-40 cm across, shining, covered with long shallow cracks, with corky edges. Leaves compound, up to 5 m long; primary divisions up to 1.5 m long; leaflets fascicular or alternate, cuneiform; upper narrower; irregularly serrate; petioles very stout, up to 5 cm across. Spathes large, embracing the young spadix, 40 cm long. Spadices numerous, spreading, pendulous, up to 3 m long or more. Flowers unisexual, 3-nate. Male flowers; 2 cm across: sepals 3, coriaceous, rounded at the apex, closely imbricate; petals 3, valvate; stamens 6, filaments very short; anthers cuneate, shorter than the petals. Female flowers smaller than males: in between 2 males: staminodes 3. Ovary obovoid, trigonous, 3-celled; ovule 1 in each cell; stigma sessile, 3-partite.

Fruits 1-2-seeded, reddish at maturity.

Common in forests. Pith obtained from trunks, is dried, powdered and is used as food by some local villagers.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 2965 Nongklaw (Khasi Hills).

Doemonorops Bl.

Doemonorops jenkinsianus Mart. Hist. Nat. Palm. 3: 327. 1831; Beccari & Hook.f. Fl. Brit. India 6: 462. 1893.

Stems scandent or climbing, young stems grey, pubescent. Leaves large; leaflets 50-60 cm long; petioles 10-20 cm long, rachis spinous, sheaths with longer spines. Male spadix thyrsiform, dense flowered. Bracts deeply grooved. Calyx 3-toothed, cupular; petals 3, deeply grooved; stmanes 6; filaments short; anthers dorsifixed. Female spadix branched; flowers distinctly pedicellate: calyx 3-toothed, cupular; corolla tubular, lobes valvate. Ovary imperfectly 3-celled; stigmas 3-partite; ovules erect. Fruits covered with closely adpressed scales, margin of scales scarious. Seeds smooth, subglobose.

Rare; in deep forests in warmer parts of Meghalaya.

Fls. & Frts.: October.

Specimens examined: Myrthong 2966 Shella (Khasi Hills).

Licuala Thunb.

Licuala peltata Roxb. Fl. Ind. 2: 179. 1832; Beccari & Hook.f. Fl. Brit. India 6: 430. 1893(Plate 81).

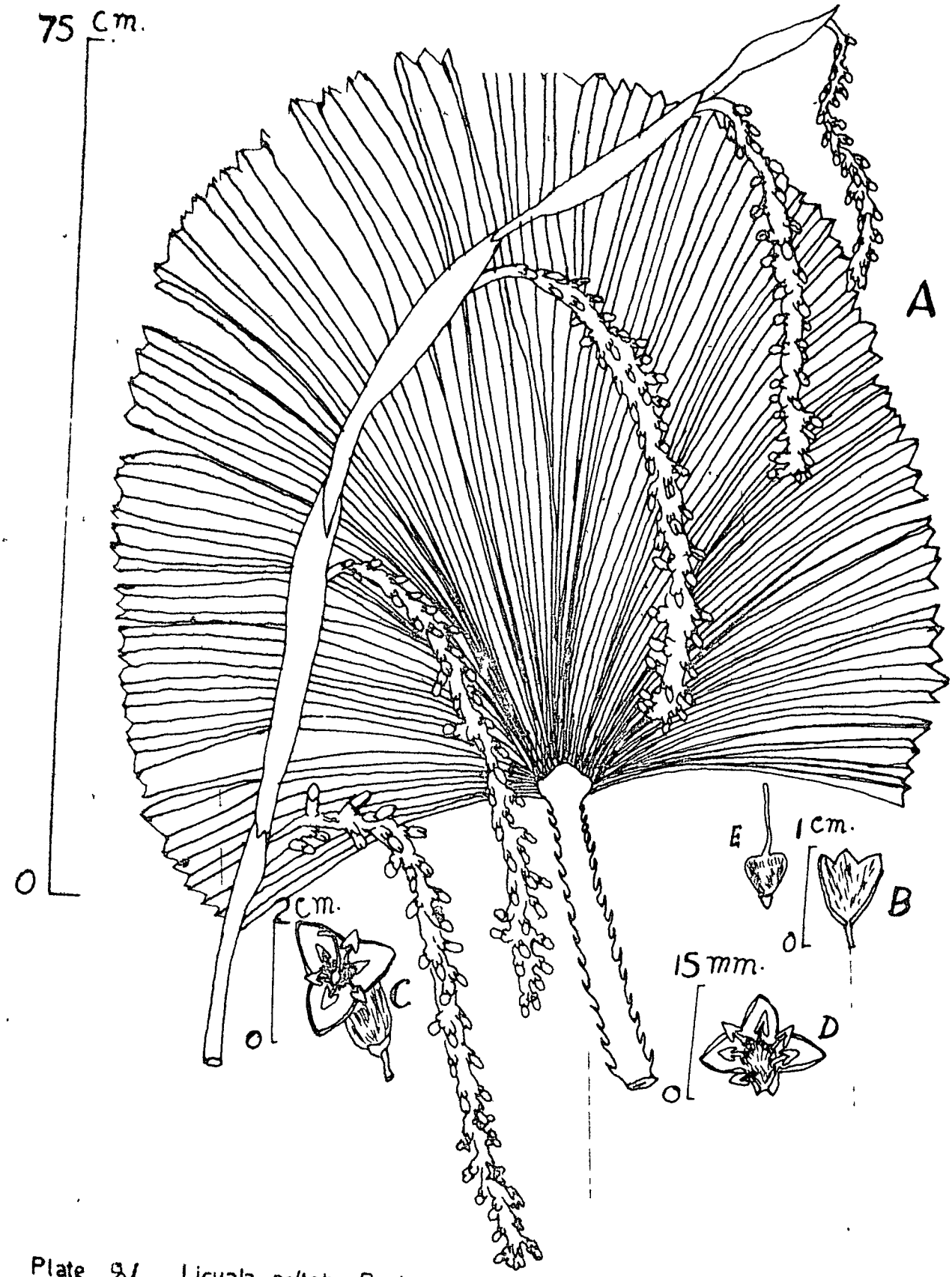


Plate 81 Licuala peltata Roxb. A. A portion of leaf & inflorescence, B. Perianth, C. Flower, D. Perianth open out showing the epiphyllous stamens, E. Pistil.

Vern.-' Ka Slow ' (K).

Stems annulated, 1-5 m high. Leaves orbicular, peltate, 1-2 m across, many partite, fan-like, confluent with toothed margin, apex of the tooth 2-fid. Petioles stout with short, stout spines on the lateral angles. Spathes tubular, 10-25 x 1.5 cm, mouth toothed. Spadix long, pendulous, tomentose. Flowers bisexual, irregularly arranged on the spadix, pubescent, 7 x 5 mm ; sepals 3, connate, silky hairy; calyx tube up to 8 mm long, shortly toothed; petals 3, linear-lanceolate, acute, thick, about 7 mm long; stamens 6, filaments stout, short, adnate to the base of the corolla tube; anthers cuneate, 4 mm long; ovary 3-celled; styles semigynobasic, 8 mm long, linear; stigma indistinct. Capsules elliptic,

Common in lower elevations under tall trees. Leaves are used for thatching and used for preparing umbrella-like structures in villages against rains.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 2904 Tasak; 3139 Baghmara (Garo Hills); 3261 Balat (Khasi Hills).

Phoenix Linn.

Tall or low palms. Stems covered with rhamboid, persistent leaf bases or petioles. Leaves pinnatisect; segments ensiform or lanceolate, lowest segments often transformed into spines; axis semiterete or flat, often widening at the base into a sheath which frequently expands into a mass of reticulate fibres. Flowers dioecious, small on several branched, interfoliar, erect or drooping spadixes. Spathes basilar. Male sepals 3, connate in a 3-toothed

cupular calyx; petals 3, obliquely ovate, valvate; stamens 6, filaments short; anthers subulate, erect, dorsifixed. Female flowers: sepals 3, connate in a globose crescent calyx; petals 3, imbricate, rounded; staminodes 6, free or connate in a 3-toothed cup; carpels 3, free; ovules erect; stigma hooked. Fruit a 1-seeded berry. Seeds oblong, ventrally grooved, with numerous papery endocarps and ruminate endosperm.

K E Y T O S P E C I E S

1a. Stems tall, clothed with persistent petiole bases; leaves crowded at the apex . . . . . sylvestris

1b. Stems normally short or 0; leaves radical or spirally arranged on short stems.

2a. Leaflets sub-opposite, fascicled, multifarious; spadix long peduncled; branches erect, stout. . . . . acaulis

2b. Leaflets scattered in interrupted fascicles; spadix short peduncled; branches spreading slender. . . . humilis

Phoenix acaulis Buch.-Ham. ex Roxb. Fl. Ind. 3: 783. 1832; Beccari & Hook.f. Fl. Brit. India 6: 426. 1893; Babu Herb. Fl. Dehra Dun 533. 1977.

Vern.- ' Sohkhajur ' (K).

Stems short, spirally clothed with leaf bases. Leaves 50-150 x 30-40 cm; leaflets 20-30 x 0.8-1.5 cm, erect, acute, glaucous beneath, thickened at base, nerves many, minute; petioles 20-40 cm

long, armed with long sharp spines, 2-5 cm long. Spadices 10-12 cm long, Brached. Branches stout, lower longer and upper ones shorter, few to many-flowered, irregularly and distantly placed. Peduncles up to 60 cm long, laterally compressed. Male flowers 5-6 mm long; sepals 3; petals 3, obliquely ovate; stamens 6; filaments short; anthers erect, dorsifixed; pistillode 0. Female flowers bigger than males; calyx 3, persistent; petals 3, longer than sepals; carpels 3; stigmas globose, sessile. Fruits 1-seeded, elliptic, 1 cm long, deep red when ripe.

Common in open areas, in grasslands and under shrubby areas.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 3259 Bhoilbong (Khasi Hills).

Phoenix humilis Royle Ill. Bot. Himal. 394. 1839; Beccari & Hook.f. Fl. Brit. India 6: 426. 1893.

Vern.-' Diengsohkhajur rit ' (K).

Stems tufted, short. Leaves up to 1 m long, glaucous; petioles and rachis armed with long, sharp spines. Leaflets numerous, subopposite, linear, 30-40 x 0.8-1 cm, acute or the apex reduced to triangular needle-shaped structures, obscurely 5-7-nerved, base slightly thickened. Spathes 15-30 cm long, straw-coloured, apex rounded. Peduncles 30-40 cm long, flat. Spadices branched; branches decurved, whorled, stout, 10 cm long, base thickened into pulvinus-like structures. Flowers orange-yellow; sepals 3, truncate; petals 3, longer than the sepals; stamens of the male flowers, 6; anthers erect, basifixed; filaments short,

pistillode 0. Female flowers : carpels 3, stigmas short, truncate. Berry elliptic, 1-seeded, pale yellow.

Common in open areas in grasslands.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3194 Jowai (Jaintia Hills).

Phoenix sylvestris Roxb. Hort. Beng. 73. 1814; Beccari & Hook.f. Fl. Brit. India 6: 425. 1893.

Vern.- ' Diengsohkhajur ' (K).

Tall, unarmed palms, trunks 8-12 m high, clothed with persistent leaf bases. Leaves greyish-green, 3-4 m long, glabrous; leaflets 20-40 cm long, ensiform, fasciculate, 2-4-farious, rigid; petioles short, compressed towards the apex, bearing at the base a few channelled triangular spines. Male flowers, white, scented. Spadix 50-60 cm long, erect; branches filiform, peduncle much compressed; spathes 30-40 cm long, scurfy, separating into 2-boat-shaped valves. Flowers 6-8 mm long, numerous, angular; calyx cupular, with 3 short, rounded sepals; petals 3, concave, warted on the outer side; stamens 6, filaments very short, free; anthers linear, shorter than petals. Female flowers on spadix, similar to males. Calyx cupular, obsoletely 3-toothed; petals 3, very broad, convolutely imbricate; staminodes 3-4. Fruits 3 cm long, oblong, or ellipsoid, orange-yellow. Seeds 1.5 mm long, rounded at the ends, grooved on the face, brown.

Common in open areas, in grasslands and in scrub jungles, and often grown in gardens. Fruits are edible and known as 'Soh-khajur' by the Khasis.

Fls. & Frts. : Major part of the year.
Specimens examined; Myrthong 3201 Umroi (Khasi Hills).

Pinanga Bl.

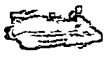
Slender plants with erect annulated stems. Leaves pinnatisect; upper leaf segments confluent. Spadices infrafoliar; spathes solitary. Flowers in clusters with 2 males and 1 female inbetween. Male flowers obliquely trigonous; sepals acute, keeled; petals ovate or lanceolate, valvate; stamens 6, or more; anthers subsessile, basifixed, erect. Female flowers smaller than the males, ovoid or globose: sepals and petals orbicular, broadly imbricate; ovary 1-celled, stigmas 3: ovules basilar, erect. Fruits ovoid or ellipsoid. Pericarp fibrous. Albumen ruminate.

K E Y T O S P E C I E S

1a. Fruits spirally arranged on spadix . . gracilis
1b. Fruits in 2-rows on the spadix. . . . hookeriana

Pinanga gracilis Bl. in Rumph. 2: 77. 1836; Beccari & Hook.f. Fl. Brit. India 6: 407. 1893.

Stems erect, 3-5 m x 1-2 cm, jointed, internodes 5-10 cm long, clavate above. Sheaths and stems scurfy. Leaves 60-90 x 30-50 cm, pinnatisect. Leaflets 30-45 x 6-8 cm, finely acuminate, basal ones linear, much narrower, 2-3 costae; upper ones 9-12-nerved, apex obliquely acute on one side; uppermost ones confluent at the base, apex bifid. Petioles 10-15 cm long, sheaths close.

Spadices pendulous, simple, developing from 2-3 nodes below the leaves. Spathe solitary, 2-fid. Peduncles 2-2.5 cm long; spadices 10-12 cm long, stout. Male flowers broad, imbricating: sepals 3, minute; petals 3, cymbiform, acuminate. Female flowers longer than males  sepals 3, imbricate, 2-4 mm long, truncate, shining; petals 3, equalling to sepals; ovary conical. Fruits elliptic, 1.5 x 0.8 cm, arranged around the spadix in 3-6- rows, narrowed at both ends.

Rare plants occuring in warmer areas, along slopes of hills.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 3112 Kyrdemkulai (Khasi Hills).

Pinanga hookeriana Beccari in Males. 3: 141. 1877 ; Beccari & Hook.f. Fl. Brit. India 6: 410. 1893(Plate 82).

Stems erect, slender, clavate, 4-5 m high. Internodes 4-8 cm long. Sheaths and stems scurfy. Leaves 70-100 x 50 cm, leaflets many, finely pinnatisect, leaflets 10-35 x 1-2 cm, base narrow, apex finely acuminate, 2-3-ribbed, uppermost about 20 x 4-6 cm, confluent at the base, 6-nerved, apex toothed. Spadices 3-6, spathe oblong, 6-12 cm long, acute. Peduncle up to 2 cm long, distichous, 3-6-branched; branches 10-15 cm long. Male flowers small: sepals 3, imbricate; petals subequal; stamens 12-15, filaments adnate to the corolla tube; pistillode 0. Female flowers lax: sepals with brown edges, imbricate; petals equalling the sepals; ovary elliptic; stigma truncate or globose. Fruits elliptic, ovoid, up to 1 cm long, arranged in 2-rows, on the spadix.

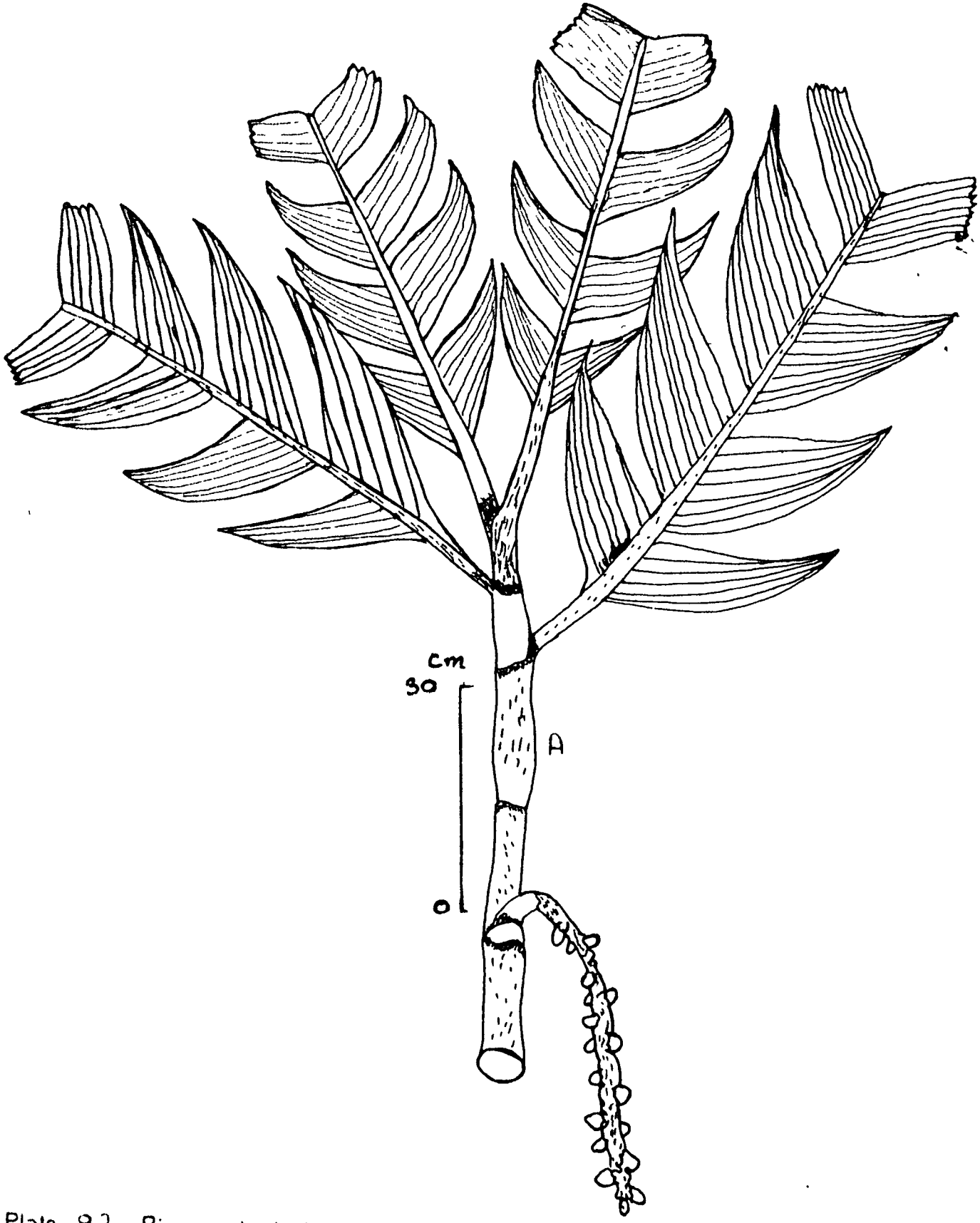


Plate 82 Pinanga hookeriana Becc., A. Portion of the stem with spadix.

Rare plants, occuring only in forests, in warmer parts of Meghalaya,

Fls. & Frts. : September to October.

Specimens examined: Myrthong 3113 Kyrdemkulai (Khasi Hills).

Trachycarpus Wendl.

Trachycarpus martiana Wendl. in Bull. Soc. bot. Fr. 429. 1861; Beccari & Hook.f. Fl. Brit. India 6: 436. 1893.

Tall, unarmed palms, 6-15 m high, 20-30 cm across, clothed below the crown with persistent leafsheaths. Leaves about 2 m across, orbicular; segments 2-toothed, coriaceous; petioles 30-50 cm long, with short, stout, spines on the margin. Spathes 30-40 cm long, cymbiform, acute, split. Spadices nodded, branched. Flowers poly-monoecious: sepals 3, ovate; petals 3, ovate, valvate; stamens 6, filaments free; anthers short, dorsifixed; carpels 3; stigmas 3, recurved; ovules basal. Drupes ellipsoid, blue.

Common garden palms, grown for their beautiful foliage.

Fls. & Frts. : Major part of the year.

Specimens examined: Myrthong 2959 Shillong.

Wallichia Roxb.

Stems short or 0. Leaves feathery, pinnatisect, segments linear, oblong, irregularly toothed, base cuneate, 1-nerved. Spathes numerous, tubular, clothing the peduncle of the spadix, upper large, cymbiform. Spadices interfoliar, branched, monoecious or polygamous. Male flowers: calyx cylindric or cupular,

membranous, truncate; corolla cylindric or cupular, deeply 3-lobed, lobes oblong, valvate; stamens 6, adnate to the corolla tube; filaments short; anthers large; pistillode 0. Female flowers smaller, subglobose; sepals orbicular, coriaceous, imbricate; petals trigonous, valvate; staminodes few or 0; ovary 2-3-celled, stipitate; stigma conic; ovules sub-basilar. Fruits ovoid, oblong. Seeds erect.

K E Y T O S P E C I E S

1a. stems tall, up to 5 m high; leaflets panduriformly excised . . . . . caryotoides

1b. Stems 0, or if present very short; leaflets sinuately toothed. . . . . densiflora

Wallichia caryotoides Roxb. Cor. Pl. 3. t. 295. 1795-1815; Beccari & Hook.f. Fl. Brit. India 6: 419. 1893. (Plate 121).

Small trees, trunks 3-5 m x 8-12 cm, covered with scars of fallen leaves. Leaves 1-2 m long, crowded at the apex; leaflets panduriformly excised; midrib stout, 2-4 cm across, glaucous; leaflets alternate, in whorls, 30-40 cm long, white beneath, toothed at the apices, base swollen. Inflorescence a large interfoliar, pendulous panicle. Rachis 30 cm long, stout, tapering gradually towards the tip. Male flowers lax; sepals 3; petals longer than the sepals; stamens 6, adnate to the corolla tube. Female flowers dense, spirally arranged on the rachis. Bracts 3-4, orbicular, very short, persistent. Sepals 3, 5 mm long, brown or green when young; petals 3, 1 cm long; ovary conical; styles short. Fruits elliptic, about

1.5 x 1 cm, 2-seeded.

Rare plants occuring in rocky and dry, exposed areas.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 3260 Mawmiuh-Trongpleng (Khasi Hills).

Wallichia densiflora Mart. Hist. Nat. Palm. 2: 190. 1831; Beccari & Hook.f. Fl. Brit. India 6: 419. 1893; Banarjee in Rec. bot. Surv. India 20(2): 229. 1973.

Vern.-' Shylla ' (K).

Stoloniferous plants. Stems short or absent. Leaves long, 1-5 m high, petioles exceedingly long, 2 m long. Leaflets alternate, sinuately lobed, white beneath, varying in size, confluent, 3-lobed, sharply toothed up to below the apex. Peduncles branched, each branch bearing dense flowers. Spathe cymbiform, leathery. Flowers dense on the branches. Sepals 3, connate; petals 3, longer than the sepals; stamens 6; filaments short; anthers sagittate; styles short; ovary subglobose. Capsules elliptic, up to 1 cm long. Seeds 2, flat.

More common than the previous species, in both dense and shrubby forests.

Fls. & Frts. June to August.

Specimens examined: Myrthong 1940 Slopes of Tura Peak (Garo Hills).

The following species are also seen under cultivation in various gardens in Meghalaya:-

1. **Borassus flabellifer Linn.**

2. **Cocos nucifera Linn. 3. Livistona chinensis R. Br.**

PANDANALES

Pandanaceae

R. Br. Prodr. 340. 1810.

Shrubs or small trees, usually with aerial stilt roots. Leaves long, ensiform, spinulose, arranged in 3-farious spirals. Inflorescence a spadix, axillary or terminal, simple or highly branched, covered by spathes. Flowers, dioecious, crowded on a catkin-like spadix. Perianth 0; staminate flowers: stamens few-many; filaments free or connate; anthers basifixed. Pistillate inflorescence ♀ compound or simple spadix, subtended by spathes; pistils ovoid, free or united; ovule basal, 1-locular. Fruits aggregate of drupes. Seeds minute, with fleshy albumen.

Pandanus (Rumph.) Linn. f.

Characters of the family.

K E Y T O S P E C I E S

1a. Shrubs or trees, branched in the upper portion; fruits large, pendulous; spines on fruit stout, up to 3-5 mm long. . . . . odoratissimus

1b. Herbs, unbranched; fruits erect; spines on fruit sharp, up to 2 cm long.. . . . . minor

Pandanus minor Ham. ex [Wall. Cat. 8592. 1830] Hook.f. Fl. Brit. India. 6: 485. 1893.

Dwarf herbs, 0.5-1 m high. Leaves ensiform, clasping the stem right from the base up to apex, basal portion overlapping, blade linear, 30-80 x 1-5 cm, acuminate; margins and midrib prickly, young leaves with short distant saw-toothed processes, whereas older leaves with sparse prickles. Female inflorescence spherical or subglobose cephathelium, composed of a large number of pointed carpellate phalanges, fused at base and free above forming a sharp spine. Male flowers: stamens connate; filaments in palmate clusters.

Common in warmer parts of Meghalaya in plains, especially border of Bangladesh, forming dense ground vegetation.

Fls. & Frts. : August to February.

Specimens examined: Myrthong 1286 Sohkha (Jaintia Hills); 1976 Baghmara (Garo Hills).

Pandanus odoratissimus (Lamk.) Linn. f. Suppl. 64. 1781; St. John Taxon 12(5): 201-204. 1963; Stone in Gard. Bull. Sing. 22(2): 236. 1967. - - P. fascicularis Lamk. Encycl. 1: 372. 1785; Hook.f. Fl. Brit. India 6: 485. 1893; Babu Herb. Fl. Dehra Dun 534. 1977. - - P. tectorius Soland. ex Parkins. J. Voy. H.M. S. Endeavour 46. 1773.

Vern.-' Sohphanshla ' (K).

Stems branched in the upper part, about 3-5 m high. Leaves spirally clasping at base around the stem and branches, crowded at the apex; blade ensiform, 1-2 m x 4-8 cm, margins provided with sharp curved prickles, prickles 2-5 x 2-3 mm, at interval or at distant places, sometimes on the dorsal midribs especially near the base; young leaves erect, while mature leaves bent from middle.

Male inflorescence subtended by a boat-shaped spathe; margins of spathe provided with reduced prickles. Racemes developing at the axils of bracts; stamens developing on the central axis; filaments short, 1-2 mm long; anthers linear, up to 12 cm long. Female inflorescence also developing at the axil of bracts and similar to that of males. Inflorescence a globose or ellipsoid cephathelium composed of a large number of carpellate phalanges; phalanges composed of mostly 4-10 concentrically fused carpels, each terminating in a reniform stigma; ovary 5-12-celled; ovule solitary. Fruit a pendulous, syncarp of drupes, spinescent.

Common in rocky areas, along the banks of rivers, streams, etc. occasionally forming a dense shrubby forest.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 1884 Cherrapunjee (Khasi Hills).

ARALES

Araceae

A. L. de Juss. Gen. 23. 1789.

Perennial herbs, rarely shrubby climbers with watery acrid milky juice. Stemless or with a short rootstock, corm or tuber. Leaves mostly radical or cauline, alternate or distichous or spiral, with membranous sheathing bases; blades entire or variously lobed, usually with long fleshy petiole. Flowers bisexual or sometimes unisexual, sessile on a spadix enclosed in a fleshy green or coloured spathe. Male flowers towards the apex and females at the base with neuters in between. Perianth reduced to scales or absent; in bisexual flowers, stamens 4-8; in male flowers 1 or

more; anthers 2-4-celled, free or connate by means of thickened connectives. Ovary sessile, 1-3-celled; styles short or long; stigmas discoid or lobed; ovules 1 or more. Fruit a berry or drupe, free or adnate to the spadix. Seeds 1 or few, small or large; albumen copious or absent.

K E Y T O G E N E R A

1a. Flowers bisexual.
  2a. Perianth present.
    3a. Scandent climbers; leaves with winged petioles. . . . . Pothos
    3b. Plants not climbing; leaves without petiole. . . . . Acorus
  2b. Perianth absent.
    4a. Plants prickly all over; spathe twisted. . . . . Lasia
    4b. Plants not prickly; spathe not twisted.
      5a. Spadix stipitate; spathe beaked. . . . . Anadendrum
      5b. Spadix not stipitate; spathe not beaked.
        6a. Ovule 1, on basal placentas . . Scindapsus
        6b. Ovules many, on parietal placentas. . . . . Rhaphidophora
1b. Flowers unisexual.
  7a. Leaves simple, orbicular, peltate or ovate-lanceolate.
    8a. Stamens connate in a synandria.
      9a. Tube of spathe not enclosing the fruits. . . . . Steudnera
      9b. Tube of spathe enclosing the fruits.

10a. Limb of spathe refracted. . . . Gonatanthus
10b. Limb of spathe straight.
11a. Ovules many on parietal placentas. . . . . Colocasia
11b. Ovules few on basal placentas. . Alocasia
8b. Stamens usually free.
12a. Spathe deciduous; staminodes 0, in female flowers; ovary 1-2-celled. . Aglaonema
12b. Spathe persistent; staminodes present in female flowers, ovary 2-4-celled. . Homalomena
7b. Leaves compound, pedatisect or pinnatisect, rarely simple.
13a. Leaves simple; spathe pure white. . . . Zantedeschia
13b. Leaves compound; spathe green or spotted.
14a. Leaves appearing after flowering. . . Amorphophallus
14b. Leaves appearing before flowering.
15a. Leaves pedatisect; spathe persistent. . . . . Typhonium
15b. Leaves pinnatisect; spathe deciduous. . . . . Arisaema

Acorus Linn.

Acorus calamus Linn. Sp. Pl. 1: 324. 1753; Hook.f. Fl. Brit. India 6: 555. 1893; Hara, Fl. East. Himal. 393. 1966; Babu, Herb. Fl. Dehra Dun 536. 1977 (Plate 83).

Vern.- ' U Bet ' (K).

Rhizomatous herbs. Rootstock with scars of fallen leaves, rooting on one side. Leaves 60-80 x 5-8 cm, flat, linear, laterally compressed, acute. Scapes angular, much shorter than the leaves. Spathes leafy, very long, seemingly continuous with the scape. Spadix 3-6 x 0.5-1 cm, cylindric, acute, developing at the base of

Plate 83 Acorus calamus Linn., A Habit

the spathe. Flowers many, arranged compactly on the spadix. Perianth 6, equalling the ovary. Stamens 6, filaments flat; anthers reniform, confluent; ovary 3-celled, stigma small. Berries few seeded.

Rare plants, occuring in the beds of streams or rivulets and along the edges of water. The plants emit pleasant odour when cut. A well known medicinal herb of the region.

Fls. & Frts. : March to June.

Specimens examined: Myrthong 1522 Shillong.

Aglaonema Schott.

Aglaonema hookeriana Schott. in Bonpland. 7: 30. 1859; Hook.f. Fl. Brit. India 6: 529. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 29. 1976.

Rhizomes stout. Leaves 20-25 x 8-12 cm, unequal sided, oblong, or ovate-lanceolate, acute, base cuneate or rounded; primary nerves about 10 pairs. Petioles stout, 20-30 cm long, sheathing up to the middle, or beyond. Peduncles as long as petioles. Spathes 2 cm long, acute, deciduous. Spadix equalling the spathe, ovary flagon-shaped. Seeds large, oblong-lanceolate, about 2 cm long, red or scarlet at maturity.

Common in dense forests, especially along the banks of streams, rivulets, etc.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 3099 Balat (Khasi Hills); 1945 Way to Tura Peak (Garo Hills).

Alocasia Neck

Alocasia indica (Roxb.) Schott. in Estr. Bot. Wochenbl. 410. 1854; Hook.f. Fl. Brit. India 6: 525. 1893.--Arum indicum Roxb. Ind. 3: 498. 1832.

Vern.-' Ka wang '(K).

Tubers stout, 8-30 cm across, with bulbous suckers. Leaves large, up to 100 x 60 cm, sagittate or orbicular, nerves prominent; sinus narrow. Petioles 1-1.5 m long, pale green, sheathing on the lower portion. Peduncles shorter than petioles; spathes green, 20-30 cm long, elliptic; tube short; limb long, oblong, cuspidate. Spadix equalling the spathes or shorter, appendage linear, longer than the inflorescence; anthers 4-celled; connectives fleshy, short; stigma sessile, 4-lobed.

Common along the banks of streams, especially near the urban areas.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1746 Mawlai (Khasi Hills).

Amorphophallus Bl.

Tuberous herbs. Petioles connate to a considerable length with aerial stems, arising at the axil of the caducous scale-leaf. Leaves solitary, 3-partite; segments pinnatisect. Flowers monoecious. Spathes with an open or convolute funnel-shaped or campanulate limb. Spadix exserted or included; appendage large, short or long. Inflorescence cylindric, dense flowered; males and females contiguous; neuters 0. Male flowers: stamens 2-4; anthers sessile, oblong, opening by apical pores. Female flowers: ovary globose, 1-4-celled;

ovule 1 in each cell, subbasal. Style short or long; stigma entire or 2-4-lobed. Fruit a cluster of berries. Seeds large.

Amorphophallus bulbifer (Roxb.) Bl. in Rumph. 1: 148. 1837; Hook.f. Fl. Brit. India 6: 515. 1893; Hara, Fl. East. Himal. 394. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 22. 1976.- - Arum bulbiferum Roxb. Fl. Ind. 3: 510. 1832 (Plate 122).

Tuberous herbs. Leaves compound; leaflets pedatisect, usually appearing after flowering, usually with bulbils or tubers in the bifurcations. Tubers globose, or bulbous. Peduncles 30-150 x 2-3 cm, fleshy with brown spots or streaks. Spathes 15-20 x 3-5 cm, yellowish-white or mottled with pink, cymbiform, subsessile. Spadix sessile, as long as or longer than the spathe. Male and female flowers contiguous; appendage as long as the inflorescence, apex rounded. Anthers 4-lobed, orbicular; stimga raised on fleshy style. Berries few seeded.

Common in almost all types of forests both on hills and in Plains, specially in the edges of the forests and in fallows.

Fls. & Frts. : May to September.

Specimens exmained: Myrthong 1632 Dawki (Jaintia Hills); 1701 Cherrapunjee, 1702 Mawmluh (Khasi Hills); 1749 Tura (Garo Hills).

Anadendrum Schott.

Anadendrum montanum Schott. in Bonpland. 5. 1857; Hook.f. Fl. Brit. India 6: 540. 1893.

Scandent climbers. Stems muricate. Branches wrinkled and black when dry. Leaves 20-30 x 5-8 cm, unequal sided, oblique

towards the smaller side, apex acute, base cuneate, nerves very many, raised on both surfaces. Petiole 5-10 cm long, geniculate, channelled. Peduncles 1-2 cm long, with scars of fallen leaves. Spathes 5-8 cm long, beaked, green. Spadix equalling the spathe, stipitate; stipe 1-1.5 cmllong, slender, cylindric, spadix pointed at both ends,. Flowers crowded on the spadix, bisexual. Perianth cupular, equalling the ovary. Stamens 4-6, filaments flat, short; anthers subreniform; ovary flat, 1-celled, obconic; stigma sessile, linear; ovules solitary. Berries pisciform.

Rare; collected once only from Tura foot hills. This species resembles dicots in vegetative condition.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 3130 Tura foot Hills.(Garo Hills).

Arisaema Mart.

Tuberous or rhizomatous herbs. Leaves compound or simple. Flowers unisexual, rarely bisexual. Spathe deciduous, tube convolute, limb tailed or acuminate, usually incurved. Spadix included or exserted in the spathe, always with a barren, filiform appendage. Male flowers: stamens 2-6, stipitate, free or connate; anthers 2-5-celled, oblong or subglobose; cells distinct or confluent. Female flowers, densely crowded: styles short or absent; stigma discoid; ovary ovoid, 1-celled; ovules 2 or more, basal, orthotropous. Fruits 1 or few seeded berries. Seeds ovoid or globose with thick testa.

K E Y T O S P E C I E S

1a. Leaves trifoliate.
  2a. Tube of spathe slender not contracted at the base; appendage filiform. . . . . album
  2b. Tube of spathe contracted at the base; appendage stout. . . . . petiolatum
1b. Leaves pedatisect, more than 3-foliate.
  3a. Appendage of spadix far exserted, tail-like. . . . . tortuosum
  3b. Appendage of spadix included or shortly exserted, not tail-like.
    4a. Neuters 0; leaflets 7-9, finely acuminate; appendage sessile, stout, subclavate with rounded top. .. fraternum
    4b. Neuters present; leaflets 7-20, capillary or acuminate at the apex.
      5a. Leaflets 15-20, with long capillary tips; appendage subsessile, not clavate. . . . . consanguineum
      5b. Leaflets 7-11, with acuminate tips; appendage slender, clavate at the tip . . . . . concinnum

Arisaema album N. E. Br. in Journ. Linn. Soc. Bot. 18: 247. 1880; Hook.f. Fl. Brit. India 6: 498. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 13.f. 11. 1976.(Plate 84).

Vern.- ' Sohsieh-bseinkhlaw ' (K).

Plate 3, Arisaema album N.E.Brown A. ant with mature spadix.

Tubers depressed. Leaves solitary, 3-foliate, lateral leaflets about 20 x 10 cm, unequal sided, base retuse, 12-18-nerved, apex abruptly acuminate, median leaflet broader near the middle and gradually tapering towards the apex. Petioles 30-40 cm long, sheathing in the basal portion enclosing the peduncle; peduncles as long as petioles. Spathes white, 6-8 cm long, tip filiform, spadix cylindric, appendage filiform, shorter than spathes. Stamens 2-6, connate. Female flowers at the base of the appendage also towards the tip; ovary 1-celled, ovoid; style 0; stigma discoid. Fruit a 1-seeded berry.

Common in deep forests usually on lime stone areas.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1886 Mawsmai (Khasi Hills); 1931 Tura Peak (Garo Hills).

Arisaema concinnum Schott. in Bonpland. 7: 27. 1859; Hook. f. Fl. Brit. India 6: 505. 1893; Hara, Fl. East. Himal. 394. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 17. 1976.

Vern.- ' Sohbsein ' (K).

Tubers depressed, 3-5 cm across. Roots tufted. Leaves solitary; leaflets 9, 20 x 5 cm, subsessile, acute. Petioles 20-30 cm long, mottled with green or brown purple. Peduncles 6-10 cm long, striped with green or brownish-green. Spathes up to 15 cm long, cymbiform, brown or striped with white; limb recurved at base; spadix stout, erect, shorter than spathes; appendage about 5 cm long, slender, clavate at the tip.

Common both in open and scrub jungles, especially on the

edges of forests. Juice of the plants causes irritation.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 1610 Jarain (Jaintia Hills).

Arisaema consanguineum Schott in Bonpland. 7: 27. 1859; Hook.f. Fl. Brit. India 6: 505. 1893; Hara, Fl. East. Himal. 394. 1966; Ramamurthy in Rec. bot. Surv. India 20(2): 229. 1973; Rao & Verma in Bull. bot. Surv. India 18(1-4): 17. f. 12. 1976.

Vern.-' Sohbsein ' (K).

Tubers globose, about 3-5 cm across. Leaves solitary; leaflets 15-20, pedatisect, linear, up to 16 x 1 cm, narrowed towards the base, apex finely filiform. Petioles 15-30 cm long, green. Peduncles 6-10 cm long; spathes 12-15 cm long, with long filiform tip, cymbiform, white. Spadix as long as tubes; appedage subsessile with few neuters at the base. Seeds canine-like.

Common throughout Meghalaya, especeally in high elavations both in open and shady places. The ripe spadix is used by some villagers as bait for trapping birds.

Fls. & Frts. : May to Decrmber.

Specimens examined: Myrthong 1145 Shillong; 2942 Jarain (Jaintia Hills).

Arisaema fraternum Schott in Bonpland. 7: 26. 1859; Rao & Verma in Bull. bot. Surv. India 18(1-4): 17. 1976 (plate 123).

Vern.-' Sohbsein ' (K).

Tubers depressed, about 5-6 cm across. Leaves solitary. Leaflets 6-9, oblong, lanceolate, finely acuminate or filiform at

the tip. Petioles 20-35 cm long, fleshy, brownish green or striped with green and white streaks. Peduncles very short, half as long as the petioles, exserted from the sheath. Spathes about 10 cm long, excluding the long,filiform,thread-like tip; tube 3 cm long; limbs lanceolate, recurved at the base. Spadix stout, 5 cm long, cylindric, appendage stout, subclavate above. Female flowers sparse when young; stigma flat, raised at the top of the short fleshy style. Berries conical, flat above, scarlet at maturity.

Common undergrowth of pine forests, as well as in the edges of broad leaved forests. The juice of the plants is said to be poisonous.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1584 Jowai (Jaintia Hills); 1871 Mawmluh (Khasi Hills).

Arisaema petiolatum Hook.f. Fl. Brit. India 6: 498. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 13. 1976.

Vern.- ' Sohbsein-khlaw' (K).

Tubers elongate,rooting all over. Leaves solitary, lateral leaflets 8-10 x 4-5 cm, unequal sided, sessile, acute at apex; median leaflet petiolate , slightly smaller than the lateral leaflets, equal sided, acute at both ends. Petioles 6-10 cm long, fleshy, spotted brown. Peduncles as long as the petioles, basal leaf reduced to membranous or scale-like sheaths. Spathes spotted, funnel-shaped, 6-8 cm long, tube purplish, short, limb contracted at the base. Spadix cylindric, shorter than the spathe; appendage cylindric, erect, obtuse, naked, shorter than the limb.

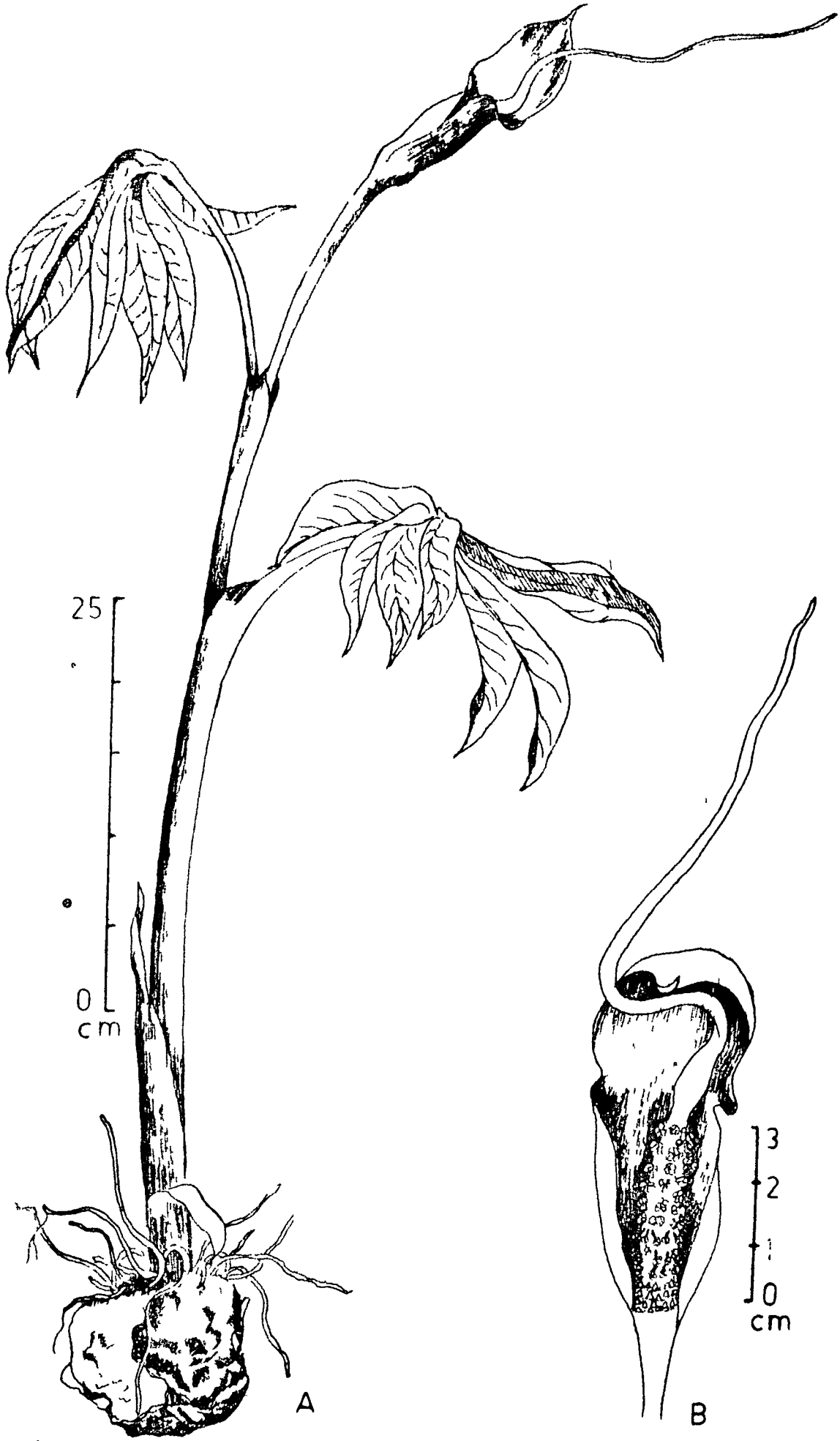


Plate 85 Arisaema tortuosum (Wall.) Schott. A. Habit, B. Spathe open out showing spadix with exerted appendage.

Rare plants occuring only in dense, very shady places.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 1692 Lailad (Khasi Hills).

Arisaema tortuosum (Wall.) Schott in Schott & Endl. Melet. Bot. 17. 1832; Hook.f. Fl. Brit. India 6: 502. 1893; Hara, Fl. East. Himal. 396. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 14. 1976; Babu, Herb. Fl. Dehra Dun 537. 1977. - - Arum tortuosum Wall. Pl. As. Rar. 2: 10. t. 3. 1830 (Plate 85).

Vern.- ' Sohbsein ' (K).

Tubers globose, 3-10 cm across. Scapes 15-100 cm high, green with pinkish stripe at the base. Leaflets generally 20, sessile, finely acuminate. Petioles varying in length. Peduncles shorter than petioles. Spathe boat-shaped, acute, whitish yellow with brown pit at the base. Spadix few-flowered. Male flowers stalked. Female flowers: ovary ovoid, attenuated into a short style. Berry 4-5-seeded. Appendage long, curved, thread like

Common both in open and shady places.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1703 Shillong; 1870 Mawmluh (Khasi Hills); 2939 Rongjeng (Garo Hills).

Colocasia Schott

Tall, coarse herbs with rhizomes or sometimes with caudex. Leaves peltate, ovate or ovate-sagittate, petioles stout, fleshy. Flowers unisexual, naked, Spathe with stout peduncle; tube thick, mouth constricted, limb erect, deciduous. Spadix shorter than the

spathe, stout or slender. Male and female flowers usually with interposed flat neuters. Appendage cylindric, subulate or rarely 0. Male flowers: stamens 3-8, connate in an obpyramidal column. Female flowers: ovary 1-celled, ovoid; stigma sessile, disciform with parietal placentas. Ovules many, orthotropous. Fruits a cluster of berries, enclosed by persistent tube of the spathe. Seeds oblong, sulcate, albuminous.

K E Y T O S P E C I E S

1a. Tubers with daughter tubers; leaves large, 30-80 x 20-60 cm; basal hastate or emarginate. . . . . esculenta

1b. Tubers without daughter tubers; leaves small, 20 x 15 cm, base cordate or retuse.

2a. Leaves suborbicular, 8-15 x 6-10 cm, blotched with brownish green inbetween the nerves. . . . . affinis

2b. Leaves orbicular, 15-20 x 10-15 cm, without blotches inbetween the nerves. . . . . fallax

Colocasia affinis Schott in Bonpland. 7: 28. 1859; Hook.f. Fl. Brit. India 6: 523. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 26. 1976.

Tubers very small 1-2 cm across, clothed with fibre-like scales. Roots numerous. Leaves peltate, suborbicular, 8-15 x 6-10 cm, blotched with brownish green in between the nerves, base retuse, sinus very shallow, apex acuminate; primary nerves 5-6-pairs,

slender. Petioles 10-20 cm long, sheathing, up to about half their length. Peduncles up to 10 cm long, slender. Spathe about 10 cm long, linear-acute, limb very long, up to 8 cm long, tube 1.5 cm long. Spadix as long as or shorter than spathe; appendage much longer than the inflorescence . Male inflorescence cylindric, longer than females, with many neuters in between; anthers 4-celled, discoid; styles short, fleshy; stigma obconic, raised above the style. Berries subglobose.

Common on moss covered rocks in forests.

Fls. & Frts. : June to September.

Specimens examined: Myrthong 1955 Tura (Garo Hills); 3129 Dawki (Jaintia Hills).

Colocasia esculenta (Linn.) Schott in Melet. 1: 18. 1832; Rao & Verma in Bull. bot. Surv. India 18(1-4): 26. 1976; Babu, Herb. Fl. Dehra Dun 537. 1977. - - Arum esculentum Linn. Sp. Pl. 965. 1753. - - Colocasia antiquorum Schott, Melet. 1: 18. 1832; Hook.f. Fl. Brit. India 6: 523. 1893.

Vern.- ' Ka Shriew ' (K).

Tubers stout with daughter tubers. Leaves peltate, large, 30-80 x 20-60 cm, base hastate or emarginate, anticous lobe slightly longer than the posticous lobe, rounded, acuminate, sinus shallow, primary nerves 6 pairs, posticous nerve divided into 2-equal nerves. Petioles 40-60 cm long, sheathing up to the middle. Peduncles shorter than the petioles. Spathe up to 30 cm long. Spadix about 15 cm long; appendage 3 cm long, conical; anthers 4-celled, filaments 1 mm long, 4-angled; styles short, fleshy; stigma obconic. Berries few seeded.

Cultivated for its edible and marketable tubers. Dried leaves are also used by village people for preparing curry and for feeding live-stock.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1935 Tura (Garo Hills).

Colocasia fallax Schott in Bonpland. 7: 28. 1859; Hook.f. Fl. Brit. India 6: 524. 1893.

Tubers 2-5 cm across with tuft of roots. Leaves 15-20 x 10-15 cm, orbicular, peltate, base retuse or cordate; sinus very shallow, apex acuminate. Petioles 10-25 cm long, fleshy, sheathing up to below the middle. Peduncles up to 10 cm long. Spathes 10-15 cm long, limb 10 cm long, tube about 3 cm , yellowish-green. Spadix 3 cm long; appendage up to 2 cm long, conical. Male and female inflorescence equalling, with few neuters in between; anthers stellately crenate; styles short; stigma disciform. Berries semi-spheric.

Common along the banks of streams, rivers, etc., both in open and shady places.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3265 Balat (Khasi Hills).

Gonatanthus Klotzsch.

Herbs with corms or tuberous rhizomes. Leaves entire, peltate, suborbicular or elliptic. Spathe with slender, convolute limb; tube constricted in the middle. Spadix cylindric; appendage long; neuters 0. Flowers unisexual, naked, monoecious. Stamens 2-3 or sometimes 2-4, connate; ovary 1-celled; ovules numerous, basilar. Fruit a

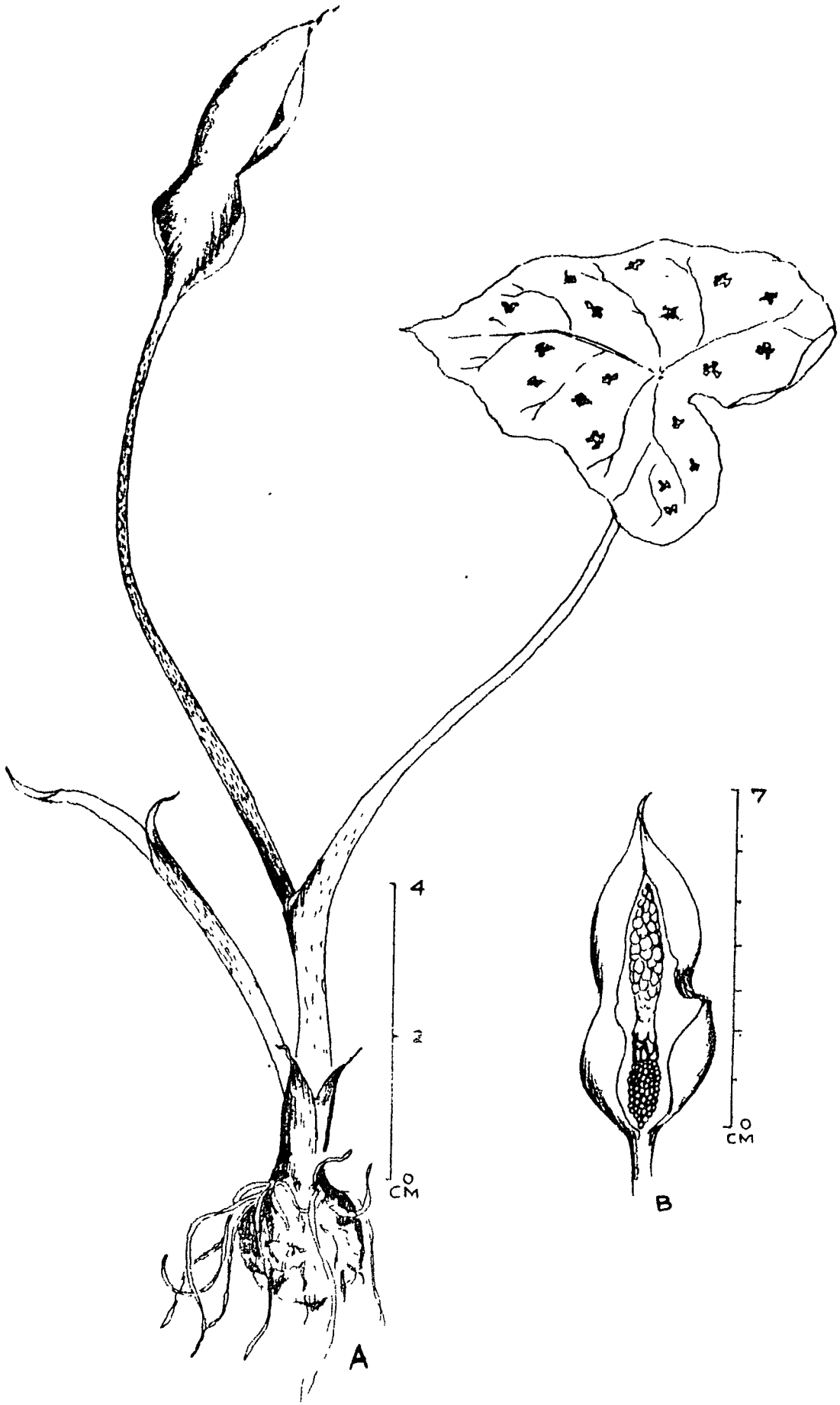


Plate 86 Gonatanthus ornatus Schott. A. Habit, B. Spathe open out showing the spadix.

a cluster of berries.

K E Y T O S P E C I E S

1a. Leaves with copper purple spots; spathe much shorter than petiole. . . ornatus

1b. Leaves without copper purple spots; spathe as long as or longer than petiole. . . . . pumilus

Gonatanthus ornatus Schott in Estr. Bot. Zeitschr. 121. 1858; Hook.f. Fl. Brit. India 6: 522. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 25. 1976 (Plate 86).

Tubers 1.5 cm across, rooting above. Leaves 8-15 x 6-10 cm, subpeltate, oblong; pink or copper-purple on the middle and green on the edges. Petiole up to 30 cm long, fleshy, tapering towards the apex, sheathing in the lower portion. Peduncles shorter than petioles. Spathes constricted in the middle, white or yellowish-white, fleshy. Spadix contracted in the middle and clavate above. Female flowers at the base in the tube and male flowers exserted in the limb of the spathe; neuters in between the male and female flowers; appendage 0; anthers rhamboid, 3-6-angled; filaments sessile; stigma orbicular, raised above the short fleshy style.

Cultivated as an ornamental pot herb, for their showy blotched leaves.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1633 Dawki (Jaintia Hills).

Gonatanthus pumilus (D. Don) Engl. et Drause in Pfl.-reich heft, 71: 19. 1920; Hara Fl. East. Himal. 397. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 25. 1976. - - Caladium pumilum D. Don Prodr. Fl. Nepal. 21. 1825. - - Gonatanthus sarmentosus Klotzsch in Link. Klot. et Otto Icon. Pl. Rar. 1: 33. 1841; Hook.f. Fl. Brit. India 6: 522. 1893.

Vern.-' Ka Shriewkyap ' (K).

Tubers small, globose, 1-2 cm across. Leaves 10-15 x 5-10 cm, peltate, ovate, cordate, acute, basal lobes very short, rounded with narrow sinus, nerves 3-4 pairs, basal costa branched near the sinus; apex slightly oblique. Petioles 8-20 cm long. Peduncles very short. Spathes as long as or longer than petioles, limb refracted, longer than the short tube, golden yellow. Spadix short, with female flowers at the base and males at the apper portion; neuters in between them.

Common on humus covered rocks and ocassionally on tree trunks. Leaves used for feeding live-stock by village people.

Fls. & Frts. : June to September.

Specimens examined: Myrthong 1814 Mylliem; 1869 Pariong (Khasi Hills).

Homalomena Schott

Homalomena pendula (Bl.) Bakh. f. in Blumea 12: 67. 1963; Rao & Verma in Bull. bot. Surv. India 18(1-4): 29. 1976. - - Caladium pendulum Bl. Cat. 103. 1823. - - Homalomena purpurea (Thunb.) Backer in Bakh.f. & van Steenis in Blumea 6: 359. 1950; H. rubens

(Roxb.) Kunth Enum. Pl. 3: 57. 1841. - -Arum purpureum Thunb. Fl. Java 20. 1825. - - Caladium rubens Roxb. Fl. Ind. 3: 515. 1832.

Rootstock stout. Leaves sagittate, deltoid, 10-20 x 10-15 cm, acuminate, base sagittate or cordate, with rounded lobe, sinus rounded. Petioles 30-40 cm long, sheathing up to the middle. Spathes erect, 3-5 cm long, cylindric, acute, pinkish-green when young and green when fully developed. Spadix shorter than the spathes, cylindric. Male flowers in the upper part and females at the base. Appendage 0. Athers oblong, connectives short, fleshy; stigma sessile. Berries many seeded. Seeds small, ovoid.

Common in deep forests, specially in lower elavations.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 1725 Burnihat (Khasi Hills).

Lasia Lour.

Lasia spinosa (Linn.) Thw. Enum. Pl. Zeyl. 336. 1864; Hara, Fl. East. Himal. 397. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 32. 1976. - - Dracontium spinosum Linn. Sp. Pl. 2: 967. 1753; - - Lasia heterophylla (Roxb.) Schott, Melet. 1: 21. 1832; Hook.f. Fl. Brit. India 6: 550. 1893.

Stout, marshy or aquatic plants with prickles or spines all over. Rootstock prostrate. Leaves deeply pinnatifid or hastate when young, 20-30 x 15-25 cm, ribs stout, with straight or curved prickles. Petioles 30-70 cm long, spiny, sheathing. Peduncles as long as or shorter than petioles, spiny. Spathes twisted, fleshy, yellow,

15-20 x 1-1.5 cm. Spadix cylindric, 2-3 cm long. Flowers crowded, perianth 4-6, truncate. Stamens 4-6; filaments short; anther cells parallel. Ovary ovoid, 1-celled; styles stout; stigma depressed. Berries rhamboid, muricate.

Common in marshy places, in association with ferns and other bushy plants. Young spathes along with the peduncles and spadix are used for preparing curry by village people.

Fls. & Frts. : March to August.

Specimens examined: Myrthong 1547 Lailad (Khasi Hills); 1991 Tasak (Garo Hills).

Pothos Linn.

Evergreen, epiphytic, climbing shrubs. Leaves distichous, blades sometimes obsolete; petioles winged, sheathing at the base. Flowers bisexual. Peduncles axillary or infra-axillary, sheathed or naked. Spathes small, ovate or concave, persistent. Spadix shorter than spathes, stipitate. Perianth 6, with hooked tips. Stamens 6; filaments short or long, linear or dilated; anthers terminal. Ovary 3-celled, ovoid, oblong or depressed. Ovules solitary in each cell, adnate to the inner angle; stigma small, sessile, hemispheric. Fruit 1-3-seeded berries, ellipsoid or often compressed.

K E Y T O S P E C I E S

1a. Inflorescence terminal; spathes 8 mm long; spadix elliptic. . . . . cathcarti

1b. Inflorescence axillary; spathes 15 mm long; spadix globose. . . . . scandens

Pothos cathcarti Schott Aroid. 1: 22. t. 44, 45. 1853; Hook.f. Fl. Brit. India 6: 552. 1893; Hara, Fl. East. Himal. 397. 1966.

Branched climbing plants. Leaves unifoliate, 10-16 x 1-3 cm, acute. Petioles winged, truncate, 3-8 x 0.6-1.5 cm; cuneate. Peduncles 1-1.5 cm long. Spathes terminal, 8 mm long, acute. Spadix 1-2 cm long. Flowers crowded in spadix. Perianth 6; stamens 6, filaments short; ovary ovoid, 3-celled; ovules adnate to the inner angle; stigma hemispheric. Beeries elliptic about 1 cm long, scarlet when ripe.

Common on tree trunks as well as on rocks in forests.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1891 Jowai (Jaintia Hills); 1553 Lailad (Khasi Hills).

Pothos scandens Linn. Sp. Pl. 968, 1753; Hook.f. Fl. Brit. India 6: 551. 1893.

Scandent on tree trunks. Leaves 10-15 x 1-4 cm, ovate-lanceolate, acute or apiculate. Petioles winged, cuneate, about 5 x 1.5 cm, truncate. Spathes 1.5 cm long, acute, brown, cymbiform, cuspidate. Spadix globose, yellow, stipitate with cataphylls at the base. Flowers crowded on globose or ovoid spadix; perianth 6; stamens 6; anthers minute; ovary 3-celled; stigma minute. Berries 0.8-1 cm long, elliptic, scarlet at maturity.

Climbing firmly attached to tree trunks. Stems highly branched with distinct scars of fallen leaves.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1966 Baghmara (Garo Hills).

Rhaphidophora Schott

Epiphytic, climbing shrubs with long aerial roots. Leaves large, oblique, entire or pinnately segmented. Petioles jointed. Flowers bisexual or rarely polygamous. Spathes cymbiform, thick, deciduous. Spadix sessile, cylindric, dense-flowered, shorter than the spathe. Perianth 0. Stamens 4-5, filaments narrowed at the tip; anthers small; ovary 2-celled, sometimes 1-celled; ovules many, on parietal placentas. Fruits of connate cluster berries.

K E Y T O S P E C I E S

1a. Leaves pinnatisect or segmented.
  2a. Leaves 40-80 x 20-30 cm, segments 8-12 pairs. . . . . decursiva
  2b. Leaves 15-25 x 10-15 cm, segments 3-4 pairs. . . . . glauca
1b. Leaves entire.
  3a. Leaves 30-60 x 15-25 cm; . . hookeri
  3b. Leaves smaller than 3a above.
    4a. Leaves 6-10 cm broad, white beneath, primary nerves 14-16 pairs, with rectangular nervation. . . gracilipes
    4b. Leaves 3-6 cm broad, green beneath; primary nerves more than 4a above; rectangular nervation absent. . . . . lancifolia

Rhaphidophora decursiva Schott in Bonpland. 5: 45. 1857; Hook.f. Fl. Brit. India 6: 547. 1893; Hara, Fl. East. Himal. 398. 1966; Rao & Verma in Bull. bot. Surv. India 18(1-4): 32. 1976.

Vern.- ' Poplarem-tngaw ' (K).

Robust, climbing plants. Stems thick, deep green with marks of fallen leaves at nodes. Leaves 40-80 x 20-30 cm, pinnatisect; segments 8-12 pairs, acute, unequal sided. Petioles upto 10 cm long, very stout. Peduncles equalling the petioles. Spathes 20-25 cm long, beaked, whitish-yellow, boat-shaped, acute. Spadix up to 12 cm long, 5 cm across, cylindric. Flowers crowded on spadix.

Common throughout Meghalaya; climbing on rocks and on tall tree trunks, in forests.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1227 Mawmluh (Khasi Hills).

Rhaphidophora glauca (Wall.) Schott in Bonpland. 5: 45. 1857; Hook.f. Fl. Brit. India 6: 547. 1893; Hara, Fl. East. Himal. 398. 1966; Ramamurthy in Rec. bot. Surv. India 20(2): 230. 1973; Rao & Verma in Bull. bot. Surv. India 18(1-4): 32. 1976; Babu, Herb. Fl. Dehra Dun 539. 1977. - - Pothos glaucus Wall. Pl. As. Rar. 2: 45. t. 156. 1831.

Vern.- ' Poplarem-tngaw ' (K).

Climbing plants. Stems herbaceous, green, with scars of fallen leaves. Leaves 15-25 x 10-15 cm, pinnatisect; segments 3-4 pairs, cuspidate, acute. Petioles as long as blades, channelled. Peduncles 8-12 cm long. Spathes cylindric, covering the spadix completely, cuspidate or acute. Spadix, cylindric, whitish green.

Flowers crowded.

Common in forests, climbing on rocks and tree trunks.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1354 Shillong.

Rhaphidophora gracilipes Hook.f. Fl. Brit. India 6: 545. 1893.

Vern.- ' Poplarem ' (K).

Scandent plants. Stems herbaceous, deep green, irregularly noded. Leaves 15-20 x 6-10 cm, white on the ventral surface, elliptic, lanceolate, unequal sided, apex acute, base rounded or slightly cuneate, nerves numerous with cross rectangular nerves. Petioles 10-15 cm long, slender, channelled. Spathes 10 cm long, erect, creamy or greenish yellow, fleshy, reddish within, cymbiform, acute. Spadix stout, cylindric, shorter than the spathe. Flowers dense; stigma orbicular, raised at the top of the conical, fleshy style. Berries deep yellow at maturity, confluent ; ovary 3-celled. Seeds 5-lobed, with depression in the centre.

Profusely climbing on rocks and on tree trunks in forests. Spadix [illegible] edible when ripe; [illegible] rural people suck the juice of the berries which are densely arranged on the spadix.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1400 Mawsmai (Khasi Hills).

Rhaphidophora hookeri Schott in Bonpland. 5: 45. 1857; Hook.f. Fl. Brit. India 6: 546. 1893; Hara, Fl. East. Himal. 398. 1966; Ramamurthy in Rec. bot. Surv. India 20(2): 230. 1973; Rao & Verma in Bull. bot. Surv. India 18(1-4): 31. 1976.

Lofty climbers. Leaves large, 30-60 x 15-25 cm, acuminate, base rounded, many nerved, thin in texture. Petioles 20 cm long, sheathing at base. Spathes 8-12 cm long, beaked, green when young, Spadix shorter than spathes. Appendage 0.

Rare plants, occuring in forests, in lower elevations. Upper branches hang down from the tree trunks.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1285 Sohkha (Jaintia Hills); 3120 Tura foot Hills (Garo Hills).

Rhaphidophora lancifolia Schott in Bonpland. 5: 45. 1857; Hook.f. Fl. Brit. India 6: 545. 1893.

Vern.-' Poplarem ' (K).

Scandent plants. Leaves 10-20 x 3-6 cm, lanceolate, unequal sided, acuminate, base rounded or cuneate. Petioles 10 cm long. Spathes longer than spadix, cuspidate. Spadix cylindric, white, 4-6 cm long. Flowers crowded on spadix. Seeds with a black mark at the centre. Berries compactly arranged on the axis.

Common on rocks and also on tree trunks in deep forests. Spadix edible when ripe.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1391 Lawsmai (Khasi Hills).

Scindapsus Schott

Scindapsus officinalis (Roxb.) Schott Melet 1: 21. 1832; Hook.f. Fl. Brit. India 6: 541. 1893; Hara Fl. East. Himal. 398. 1966. - - Pothos offinalis Roxb. Fl. Ind. 1: 452. 1820.

Tall climbers. Stems profusely branched. Leaves 10-16 x 5-10 cm, ovate-lanceolate, dark green, apex caudately acuminate, base rounded. Petiole as long as blades, winged up to the knee. Spathe creamy yellow within, greenish-white without, beaked; spadix as long as spathe, greenish-yellow. Stigma elongate, hemispheric. Berries fleshy. Seeds ovate-cordate.

Common on tree trunks, in dense forests specially in lower elevation.

Fls. & Frts. : August to October.

Specimens examined: Myrthong Araimai (Garo Hills).

Steudnera Koch.

Steudnera colocasioides Hook.f. Fl. Brit. India 6: 520. 1893; Rao & Verma in Bull. Bot. Surv. India 18(1-4): 23. 1976.

Vern.- ' Ka Wangblei' (K), Ka Shriewblai (J).

Rootstock stout, elongated, clothed with brown fibrous sheaths, above. Leaves 25-40 x 15-25 cm, acute; nerves 6-8 pairs, posticous nerves 4, branched. Petioles 15-30 cm long. Peduncles as long as the petioles. Spathes about 10 cm long, tube short, 2 cm long; limb 8 cm long, acuminate. Spadix up to 8 cm long, conical. Female part of inflorescence very short, separated by neuters from the males; anthers rhamboid, connective fleshy, spreading above; stigma orbicular, raised from the stout style. Berries pisciform.

Common in deep forests on the banks of streams, etc.

Fls. & Frts. : June to December.

Specimens examined: Myrthong 1669 Umling (Khasi Hills); 2924 Tura Peak (Garo Hills).

Typhonium Schott

Typhonium trilobatum Schott in Wien. Zeit-schr. 3: 72. 1829; Hook.f. Fl. Brit. India 6: 509. 1893; Rao & Verma in Bull. bot. Surv. India 18(1-4): 19. 1976(Plate 87).

Tuberous herbs. Leaves simple, 3-lobed, midlobe larger than the lateral lobes, lobes 10 x 5 cm, acute. Petioles 10-20 cm long, green or brownish green. Peduncles 3-10 cm long. Spathes long up to 16 cm long, contracted in the middle. Tube short, 4 cm long, limb long, twisted in the upper portion, 12 cm long. Spadix shorter than the red spathe, completely enclosed by the spathe; base with fleshy hairs. Flowers dense.

Common in all types of forests specially in betel nut plantation, associated with other herbaceous plants.

Plate 87 Typhonium trilobatum (Linn.) Schott. , A. Habit, B. Spathe open out showing the spadix.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1631 Dawki (Jaintia Hills); 1753 Burnihat (Khasi Hills); 3018 Tasak (Garo Hills).

Zantedeschia Spreng.

Zantedeschia aethiopica Spreng.

Tubers globose. Leaves radical, sagittate, acute, deep green, 10-25 x 8-20 cm, usually undulated. Petioles fleshy, long, sheathing, channelled. Peduncles as long as the petioles, fleshy. Spathe pure white, connate at base, apex rounded, limb much longer than the tube. Spadix cylindric, yellow, shorter than the spathe. Male part of the spadix much longer than the female part. Males in the upper portion of the spadix; anthers 2-celled, yellow; filaments short, fleshy. Female flowers at the base in the tube of the spathe; styles fleshy, broader at the base; stigma raised on the fleshy style.

Cultivated as an ornamental, mainly because of the large white spathe with the spadix.

Fls. & Frts. : March to December.

Specimens examined: Myrthong 1563 Shillong.

L I L I I D A E

LILIALES

Pontederiaceae

Kunth in H.B.& K. Nov. Gen. Sp. 1: ed. fol. 211, ed.qu. 265. 1816.

Aquatic or marshy herbs with offsets, stolons or rhizomes. Leafy stems 1-foliate, springing from the rootstock or from the joints of the floating stem. Leaves long petioled, floating or emergent, with sheathing bases, spongy and sometimes with inflated petiole. Flowers bisexual, racemose or spicate, rarely fasciculate or paniculate at the ends of 1-leaved stems or branches; bracts spathaceous; perianth 6, in 2-series, inferior, petaloid, usually tubular; stamens 3 or 6, unequally adnate to the perianth-lobes, upper shorter; anthers oblong, with 2 parallel cells; carpels 3; ovary superior, 3-celled with axile placentas, or 1-celled with parietal placentas, each placenta with many 2-seriate ovules; styles filiform; fruit a dry, loculicidal, 3-valved capsule. Seeds ribbed.

K E Y T O G E N E R A

1a. Rooted marshy herbs; petioles not swollen; anthers horned. . . . . Monochoria

1b. Free-floating aquatic herbs; petioles swollen and spongy; anthers not horned. . . . . Eichhornia

Eichhornia Kunth.

Eichhornia crassipes (Mart.) Solms. in DC. Mon. Phan. 4: 527. 1883; Subram. Aq. Ang. 70, t. 48. 1962; Hara Fl. East. Himal. 402. 1966. - - Pontederia crassipes Mart. Nov. Gen. Sp. Pl. 1: 9, t. 4. 1823.

Stoloniferous, free floating, aquatic plants. Roots fibrous, tufted, dark brown. Leaves in rosettes, 20-40 cm long, glabrous and shining; petioles spongy and swollen at the base. Flowers bisexual, very showy, congested on spicate inflorescence; perianth 6, with unequal lobes; lower 3, small 1 x 0.8 cm; stamens 6, 3 longer, hairy; anthers 2-celled; ovary superior, 3-celled; ovules numerous in each cell; styles 3, connate at base; stigma lobed, hairy. Fruit a capsule. Seeds ovoid.

Common in ponds, tanks and stagnant waters, in plains. Its multiplication is so rapid that it covers the whole pond or tank within a few year, completely concealing the water surface, and checking the spread of all other aquatic plants in the ecosystem. This has become a nuisance in Fish ponds also.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1474 Phulbari, 3118 Agarobadha (Garo Hills).

Monochoria Linn.

Aquatic or marshy herbs, rhizomes covered with leaf-sheaths. Leaves radical and solitary at the top of the emerging stem or branches; petioles long, spongy. Flowers bisexual, in racemes at the

axil of the cauline leaves. Perianth 6, campanulate, subequal; stamens 6, adnate to the perianth-lobes, one usually largest, with filament toothed on one side; anthers basifixed, horned; ovules numerous in each cell; styles filiform; stigma 3-lobed. Fruit an oblong, membranous loculicidal capsule. Seeds numerous, ovoid, obtuse, ribbed.

K E Y T O S P E C I E S

1a. Rhizomes long, creeping; leaves hastate or sagittate; flowers subumbellate or racemose. . . . . hasta

1b. Rhizomes short; leaves ovate, not sagittate; flowers subspicate. . . . . vaginalis

Monochoria hasta (Linn.) Solms. in DC. Mon. Phan. 4: 523. 1883; Babu Herb. Fl. Dehra Dun 523. 1977. - - Pontederia hasta Linn. Sp. Pl. 288. 1753; - - Monochoria hastaefolia Presl. Rel. Haenk. 1: 128. 1827; Hook.f. Fl. Brit. India 6: 362. 1893.

Rootstock long, creeping. Scape fleshy, lower portion ... clothed with brownish-violet scales. Leaves hastate or sagittate, 3-10 x 0.5-5 cm; petioles long, spongy, up to 30-50 cm long, uniformly slender. Inflorescence subumbellate, enclosed by an inflated petiole. Flowers bluish-violet with pale green nerves; perianth 6, in 2-series, outer 3 segments smaller than the 3 inner segments; stamens 6; anthers elongated, 2-celled, horned, yellow, shorter than the perianth segments; filaments shorter than the anthers; 1 stamen largest, with blue anther; styles about 1 cm long; stigma

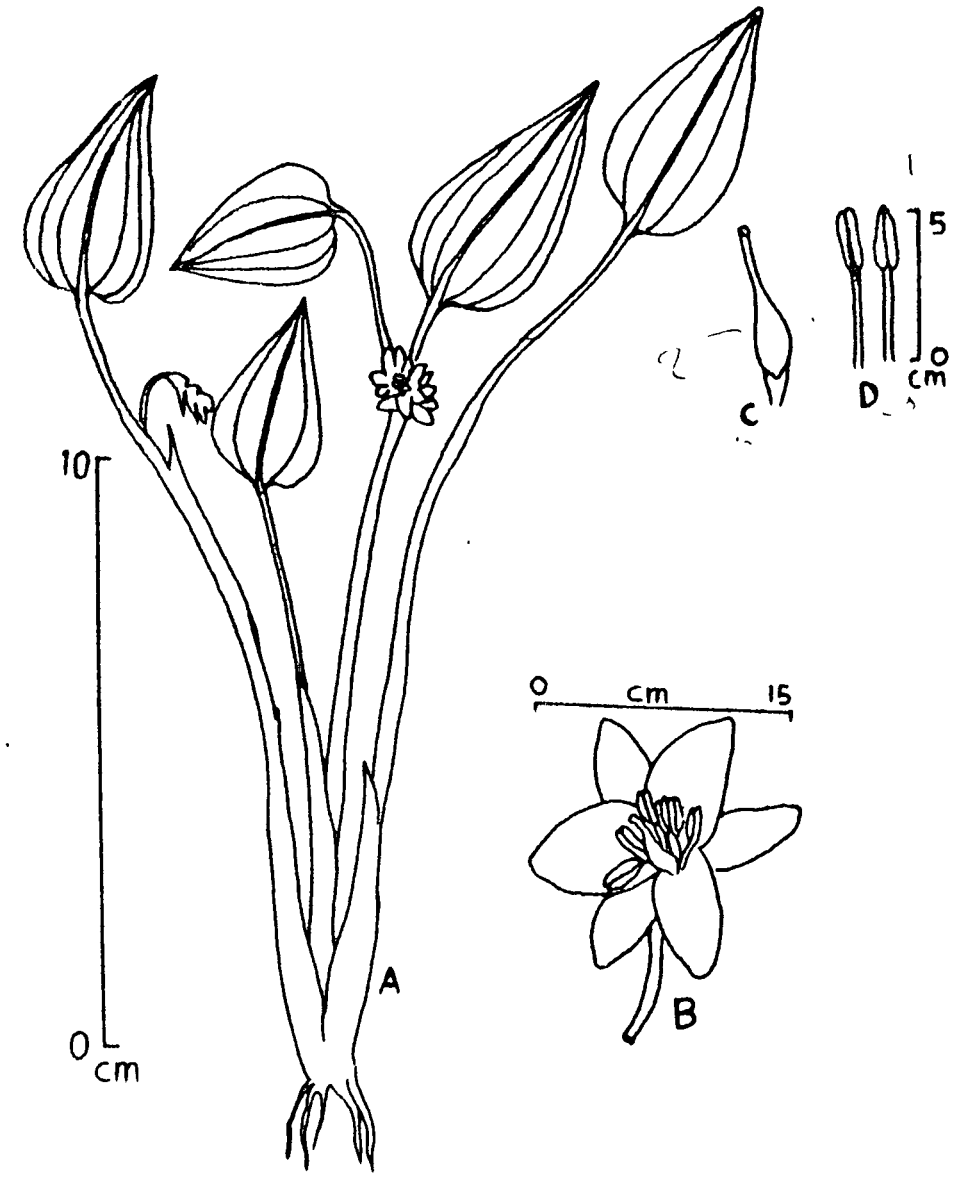


Plate 88 Monochoria vaginalis var. plantaginea Solms-Laubach.
A. Habit, B. Flower, C. Stamens, D. Pistil.

obscurely 3-lobed. Capsules elliptic, 6-ribbed, 1.5 cm long. Seeds numerous .less than half a milimeter, longitudinally ribbed.

Common in ditches , margins of tanks, pools, and in water channels and in all marshy habitats, both in open and shaded areas. One of the dominant weed species in the paddy fields also.

Fls. & Frts. : April to December.

Specimens examined: Myrthong 1359 Lailad (Khasi Hills); 1414 Baghmara (Garo Hills).

Monochoria vaginalis (Burm.f.) Presl. ex Kunth Enum. Pl. 4: 134. 1843; Hook.f. Fl. Brit. India 6: 363. 1892; Subram. Aq. Ang. 69, t. 43. 1962; Hara Fl. East. Himal. 402. 1966; Babu Herb. Fl. Dehra Dun 523. 1977. - - Pontederia vaginalis Burm.f. Fl. Ind. 80. 1768 (Plate 88).

Vern.- ' Lapohdong ' (K).

Roots tufted. Stems short 5 cm high. Leaves ovate, acute, 2-6 x 0.5-1.5 cm; petiole slender, spongy, about 20 cm long. Flowers bisexual; pinkish-yellow; perianth 6, 1 cm across; outer lanceolate, 0.5-1 cm across, inner broader; stamens 6, one largest, with blue anther; filaments of the largest one 1 cm long, with acute horn on one side; styles 2-3 mm long; stigma 3-lobed. Capsules elliptic, 1 cm long, glandular. Seeds minute, rounded at both ends.

Common in paddy fields as weeds and also in shallow ponds, tanks, ditches, etc. Leaves used for preparing curry by some local people.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1672 Umling (Khasi Hills); 1911 Agarobadha (Garo Hills).

Liliaceae

A.L. de Juss. Gen. 48. 1789.

Annual or perennial herbs, rarely undershrubs or climbers. Rootstock creeping, bulbs or corms. Leaves variable. Flowers bisexual, axillary or terminal, solitary or in various type of inflorescences. Bracts scarious or spathe-like. Perianth 6, herbaceous, petaloid, in 2-series; free or connate at the base, imbricate in bud. Stamens 6, rarely 3 or fewer; filaments free or partially connate; anthers dorsifixed or versatile. Carpels 3, united in 3-celled ovary; ovules 2 or more on the inner angles of the cells, anatropous, rarely orthotropous. Fruit a capsule or a berry. Seeds globose or flat; testa variable, albuminous.

K E Y T O G E N E R A

1a. Leaf apex modified into coiled tendril-like structures for climbing. . . . . Gloriosa

1b. Leaves not as above.

2a. Rootstock bulbous.

3a. Flowers in racemes; capsules winged. . . . . Chlorophytum

3b. Flowers in panicles; capsules not winged.

4a. Flowers large, nodding or pendulous; anthers versatile. . . . . Lilium

4b. Flowers small, erect, not nodding; anthers basifixed.

5a. Flowers 1-4, in cymes; perianth funnel-shaped; anthers reflexed. . . . Hemerocallis

5b. Flowers numerous, in racemes perianth spreading; anther erect. . . . . Dianella

2b. Rootstock rhizomatous, tuberous, or a tunicated corm.

6a. Rhizomatous herbs; stems herbaceous, unbranched.

7a. Leaves 4 or more in whorl; flowers solitary, terminal; petals reduced to long thread-like structures . . . . . Paris

7b. Leaves numerous, opposite; flowers numerous; petals otherwise.

8a. Flowers axillary; perianth campanulate, lobes not spreading. . . Polygonatum

8b. Flowers terminal; perianth spreading, lobes spreading. . . Smilacina

6b. Tuberous or tunicate, stems branched or not.

9a. Rootstock a tunicated corm; leaves 1 or more; flowers 1-3, ♀♂ ♂ ♂. . . Iphigenia

9b. Rootstock tuberous; leaves many; flowers numerous.

10a. Scapose herbs; scapes axillary, or lateral.

11a. Scapes lateral, naked, bearing a unilateral raceme or spike; leaves linear, 4-8 mm wide; stigma small not peltate. . . . Theropogon

11b. Scapes axillary; leaves much wider; stigma large, peltate or not.

12a. Spikes erect, pyramidal; flowers directed downwards. . . Kniphofia

12b. Spikes arched; flowers not directed downwards. . . . . Tupistra

10b. Plants not scapose.

13a. Plants hairy all over; fruits a septicidal capsule. . . . . Tricyrtis

13b. Plants not hairy; fruit a berry. . . . . Disporum

Chlorophytum Ker-Gawl

Rootstocks stout; roots tuberous. Leaves radical, often flattened at base. Flowers in racemes or spikes on simple or branched scapes; bracts small, scarious or membrahous. Perianth petaloid, persistent or deciduous; segments free, rotate. Stamens 6, free, or the inner 3 adnate to the perianth segments; filaments filiform, inserted in a pit at the back of the connective; anthers linear. Ovary 3-celled, winged; styles filiform; stigma small. Fruit a 3-winged capsule. Seeds compressed, black.

K E Y T O S P E C I E S

1a. Leaves broad, 1-2 cm wide; flowers spicate on a terminal scape. . . . . arundinaceum

1b. Leaves narrow, 6-12 mm wide; flowers racemed on a branched scape. . . . . khasianum

Chlorophytum arundinaceum Baker in Journ. Linn. Soc. Bot. 15: 323. 1876; Hook.f. Fl. Brit. India 6: 333. 1892; Hara Fl. East. Himal. 406. 1966.

Vern.-' Jalei ' (K).

Roots tuberous. Scapes slender 40-80 cm high. Leaves 40-60 x 2-4 cm, linear-lanceolate, acute, narrowed at base. Spikes terminal, shortly branched. Bracts 2-5 x 0. 5 cm, acute, white, cymbiform, many nerved; bracteoles 0.5-1 cm long, cymbiform. Perianth 6, in 2-series, white, subequal 1 cm long; stamens 6; filaments very short; styles short. Capsules 3-winged.

Common in forests, specially in bamboo forests, constituting the herb layer.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 1688 Burnihat (Khasi Hills).

Chlorophytum khasianum Hook.f. Fl. Brit. India 6: 334. 1892; Hara Fl. East. Himal. 3 Rep. 131. 1975.

Vern.- ' Jalei ' (K).

Stems simple, 0.5-2 m high, glabrous, slightly compressed. Leaves 30-50 x 0.5-1.2 cm, linear, mostly radical, median nerve white, prominent, raised up on the ventral surface, base sheathing. Racemes elongated. Pedicels 5-15 mm long, at the axil of the bracts flowering bracts 1-2 cm long, cuneate, acute. Flowers linear, white. Perianth 6, 1-2 x 0.5-1 cm, in 2-seriate, outer pinkish-white, inner white, subequal; stamens 6, free; anthers linear, long, yellow; styles filiform, 1 cm long; ovary 3-celled, globose. Capsules 3-winged, white.

Common in fallows, and in scrub jungles, in association with grasses. Plants are edible.

Fls. & Frts.; July to October.

Specimens examined: Myrthong 1057 Shillong; 1120 Shillong Peak; 1866 Mawmluh; 1904 Mylliem (Khasi Hills).

Dianella Lamk.

Dianella ensifolia (Linn.) DC. in Red. Lil. 1, t. 1. 1802; Hook.f. Fl. Brit. India 6: 337. 1892; Majumdar in Rec. bot. Surv. India 20(2): 224. 1973. - - Dracaena ensifolia Linn. Mant. 1: 63. 1767 (Plate 89).

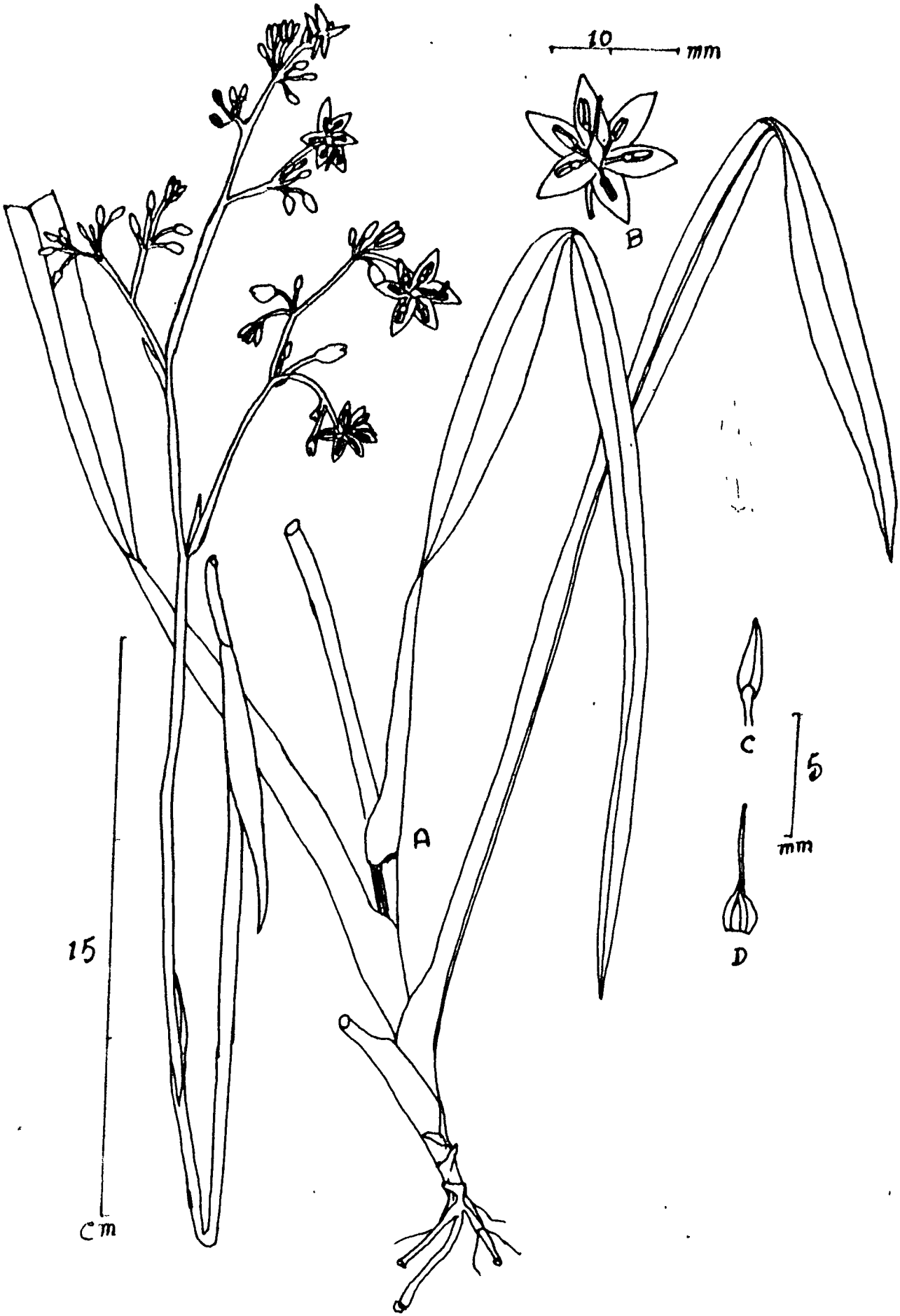


Plate 89 Dianella ensifolia(Linn.) DC. A.Habit B.Flower (top view), C.Stamen D.Pistil.

Rootstock branched, stoloniferous, roots thick. Stems jointed, slightly compressed, 40-80 cm high. Leaves 30-60 x 2 cm, linear, ensiform, acute or subacute, sessile, base sheathing, distichously. Racemes branched. Flowers pedicellate, 1 cm across. Perianth 6, in 2-series; outer series sepaloid, 6 mm long, ovate; inner series equalling the outer ones, petaloid. Stamens 6, opposite to each perianth lobe; filaments short, stout, clavate at the apex; anthers cuneate, acute, 4 mm long, yellow, basifixed; styles filiform, longer than the stamens ; ovary conical. Capsules globose, deep blue when ripe.

Common undergrowth of pine forests, in association with ferns and other herbaceous plants.

Fls. & Frts. : Major part of the year.

Specimens examined: Myrthong 1525 Shillong (Khasi Hills); 1581 Jowai (Jaintia Hills).

Disporum Salisb.

Rootstocks creeping. Stems herbaceous, angular, leafy. Leaves sessile or subsessile, strongly nerved. Flowers in axillary or terminal umbels; perianth 6-lobed, campanulate, spreading at the tip, base spurred, or saccate; stamens 6, filaments short; anthers dorsifixed, erect; ovary 3-celled; ovules 2-6 in each cell; styles fleshy, short or long; stigmas 3. Fruit a fleshy berry. Seeds subglobose, testa brown.

K E Y T O S P E C I E S

1a. Flowers in axillary or terminal umbels; perianth white, not spotted; styles longer than perianth lobes; fruits 4-seeded. . . . . cantonense

1b. Flowers in terminal umbels; perianth purple spotted, spurred at base; styles as long as perianth lobes; fruits 2-seeded. . . . . calcaratum

Disporum calcaratum D. Don in Trans. Linn. Soc. 18: 516. 1840; Hook.f. Fl. Brit. India. 6: 356. 1892,

Stems erect, up to 1 m high, branched with dry brown scales at the nodes. Leaves 5-8 x 2-5 cm, lanceolate, acuminate, 6-7 nerved, nerves prominent, convergent with small rectangular cross nerves, base rounded or cuneate. Petioles very short, 1-2 mm long, or sessile. Flowers purple spotted, 1-1.5 x 0.8-1 cm; perianth 6, campanulate, in 2-series, spurred at the the base; stamens 6, filaments up to 1 cm long, filiform, free; anthers about 4 mm long, opposite to the perianth lobes, yellow; styles long, fleshy, equalling the perianth lobes; stigma 3, coiled. Berry 4-seeded, globose, 4-8 mm across, deep blue.

Common in all types of forests.

Fls. & Frts. : April to October.

Specimens examined: Lyrthong 1154 Shillong; 1564 Shillong Peak.

Disporum cantoniense (Lour.) Merr. in Philip. Journ. Sci. 15: 229. 1919; Hara Fl. East. Himal. 407. 1966; Majumdar in Rec. bot. Surv. India 20(2): 224. 1973. - - Fritillaria cantoniensis Lour. Fl. Coch. 206. 1790. - - Disporum pullum Salisb. in Trans. Hort. Soc. Lond. 1: 331. 1812; Hook.f. Fl. Brit. India 6: 360. 1892.

Stems erect, 1-2 m high, branched, with dry brown scales at the nodes.Leaves 5-15 x 3-5 cm, alternate,acuminate, 5-7-nerved, base rounded or cuneate. Umbels 1-8-flowered, axillary; pedicels 3 cm long; flowers white, 1.5 x 0.8 cm. Perianth 6, in 2-series, connate, campanulate; stamens 6; filaments short; anthers long, 8 mm long, yellow, surrounding the pistil; style cylindric,longer than the perianth. Berry globose, 2-seeded, 5-6 mm across, blue when ripe. Seeds convex as big as the berry, flat on one face.

Common in dense forests, in association with other herbaceous plants.

Fls. & Frts. : May to October.

Specimens examined: Nyrthong 1119 Shillong; 1221 Cherrapunjee; 1839 Nongstoin; 1901 Mawsmai Cave (Khasi Hills).

Gloriosa Linn.

Gloriosa superba Linn. Sp. Pl. 305. 1753; Hook.f. Fl. Brit. India 6: 358. 1892; Babu Herb. Fl. Dehra Dun 1519. 1977 (Plate 91).

Climbing plants. Rhizomes prostrate. Leaves 5-10 x 2-3 cm, (excluding the long coiled tip). Flowers pedicelled, showy. Perianth 6-partite, 5-6 x 1 cm, waved, reflexed; stamens 6, 4-5 cm long;

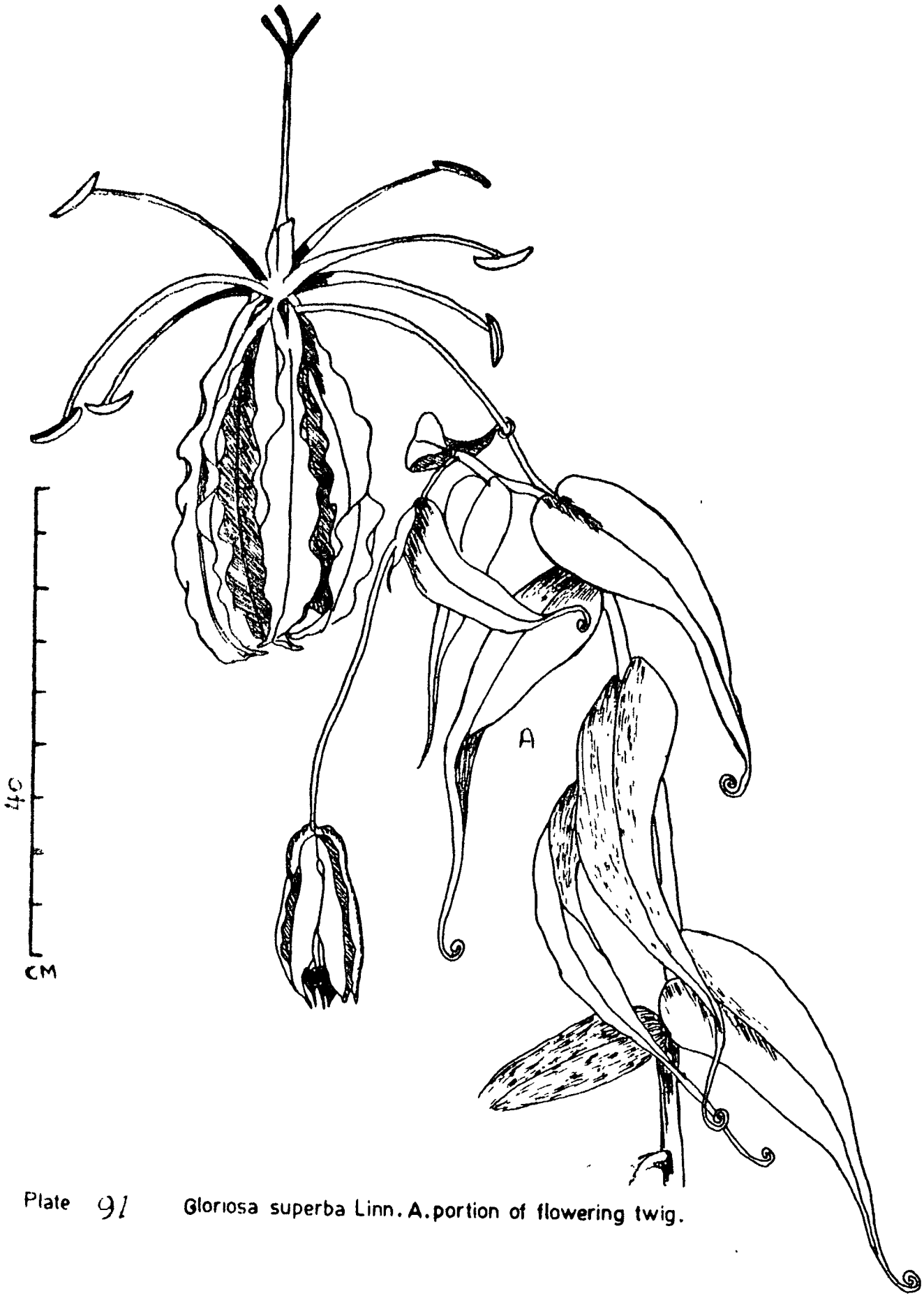


Plate 91 Gloriosa superba Linn. A. portion of flowering twig.

anthers elongated, about 1 cm long; carpels 3. Capsules 3-5 cm long, many seeded.

Occasional in bushes; often cultivated.

Fls. & Frts.: August to October.

Specimens examined: Myrthong 3026 Shillong.

Hemerocallis Linn.

Hemerocallis fulva Linn. Sp. Pl. ed. 2, 1: 462. 1762; Hook. f. Fl. Brit. India 6: 325. 1892; Hara Fl. East. Himal. 408. 1966.

Bulbs 2-4 cm across, scaly. Scapes 30-100 cm high, shining. Leaves radical, ensiform, 50-80 x 1-2 cm, obtuse, midrib prominent. Flowers solitary, 8-10 cm long, orange-yellow, pedicels 5-15 cm long. Perianth 6, tube long, lobes reflexed. Stamens 6, filaments as long as the perianth tube; anthers basifixed, reflexed; styles as long as perianth lobes, 3-fid.

Common along the banks of streams, in the forests. Also cultivated for their showy flowers.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1189 Shillong.

Iphigenia Kunth

Iphigenia indica (Linn.) A. Gray in Kunth Enum. 4: 213. 1843; Hook.f. Fl. Brit. India 6: 357. 1892; Babu Herb. Fl. Dehra Dun 226. 1977.

Grass-like herbs; bulbs tunicated, 1 cm across, covered with thin brown scales. Stems 8-16 cm high, glabrous. Leaves sessile,

linear, or subulate, sheathing at base, 3-10 x 0.3-0.5 cm, acute, with 1-median nerve. Flowers, terminal, 1-3 together, bisexual; perianth 6, chocolate brown, linear, about 1 cm long, 1 mm across; stamens 6; filaments connate at base to the perianth segments; anthers 2-celled; styles short; carpels 3, recurved. Capsules 3-valved. Seeds many.

Common in open grassy areas in pine forests.

Fls. & Frts. : June to November.

Specimens examined: Myrthong 1142, 1774 Shillong.

Kniphofia Th. Dur. & Schinz.

Kniphofia uvaria Th. Dur. & Schinz. Consp. Fl. Afr. 5: 294. 1895.

Perennial tufted plants. Scapes 50-80 x 0.5-1.5 cm, fleshy, green. Leaves radical, numerous, dense, drooping, 1 m x 2 cm, linear, gradually tapering at apex, margin scabrid, base sheathing. Inflorescence a terminal pyramidal spike. Flowers dense, projecting downwards, linear, basal flowers 2-2.5 cm long; upper ones 5 mm long, sessile. Perianth 6, connate for the whole length, free only at the apex, tube cylindric, 2 cm long, lobes 5 mm long, ovate acute, subequal; stamens 6; filaments free, filiform, 1 cm long; anthers minute, 2-celled, basifixed, sagittate; styles filiform, longer than the filaments.

Cultivated for their showy spikes and flowers, often seen as escapes.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1760 Laitkor (Khasi Hills).

Lilium Linn.

Lilium giganteum Wall. Tent. Fl. Nepal. 21. t. 12. 1824; Hook.f. Fl. Brit. India 6: 349. 1892; Majumdar in Rec. bot. Surv. India 20(2): 225. 1973. - - Cardiocrinum giganteum (Wall.) Makino in bot. Mag. Tokyo 27: 125. 1913; Hara Fl. East. Himal. 406. 1966.

Vern.-' Tangtadew ' (K).

Rhizomes with many white, tufted glandulous roots. Scapes erect, robust, jointed, hollow, up to 5 m high. Leaves radical, broad, 30-40 x 20-30 cm, shining, mucronate, cordate at base; primary nerves stout, lateral nerves 6-8 pairs, branched. Flowers large, funnel-shaped, white, very fragrant. Perianth 6, connate throughout the whole length, white with brown edges, imbricating, reflexed; stamens 6; filaments long, 8 cm long, broader towards the base; anthers 1 cm long, basifixed, styles 10 cm long; stigma globose, 3-lobed. Ovary elongated, up to 4 cm long.

Common in marshes in forests and also along the banks of streams, rivulets, etc.

Fls. & Frts. : June to September.

Specimens examined: Myrthong 1766 Shillong.

Paris Linn.

Paris polyphylla Smith in Rees. Cyclop. 26: no. 2. 1819; Hook.f. Fl. Brit. India 6: 362. 1892; Hara Fl. East. Himal. 410. 1966.

Rhizomes annulated. Stems glabrous, brown, 30-70 cm high. Leaves whorled, 10-15 x 3-6 cm, lanceolate, acuminate, 3-nerved.

Petioles 1-2 cm long. Flowers sclitary, terminal; sepals 4-6, leafy, green, ovate, acuminate, 4-6 x 2-3 cm; petals reduced to thread-like structures, 6-10 x 0.2 cm; stamens 6, brown yellow, 1-2 cm long; anthers much longer than the filaments. Carpels 4-10, free or connate at base. Ovary 4-10-celled, with parietal placentas. Fruit a berry.

Common both in shrubby and dense forests, specially in rocky areas, along the banks of the streams.

Fls. & Frts. : May to October.

Specimens examined: Myrthong 1747 Shillong; 1779 Pariong (Khasi Hills).

Polygonatum (Tourn.) Adans.

Polygonatum oppositifolium (Wall.) Royle Ill. bot. Himal. 380. 1839; Hook.f. Fl. Brit. India 6: 320. 1892; Hara Fl. East. Himal. 412. 1966; Majumdar in Rec. bot. Surv. India 20(2): 225. 1973 (Plate 92).

Rhizomes thick, fleshy, green. Stems ribbed, 30-60 cm high. Leaves simple, opposite, obovate, shining, blade 6-10 x 2-5 cm, 6-9-nerved, acuminate. Inflorescence axillary, peduncles 0.5-5 cm long, generally 3-5-flowered. Flowers tubular, cylindric. Perianth 6, white, connate, pendulous, hairy at the tip. Stamens 6, attached to the tube of the perianth; filaments shorter than the anthers; anthers yellow, 2-celled, elongated, acute; styles short, densely hairy at the tip. Capsules globose, scarlet or orange when ripe, 0.6-1 cm across, many seeded.

Common on the edges of rocks and also on tree trunks.

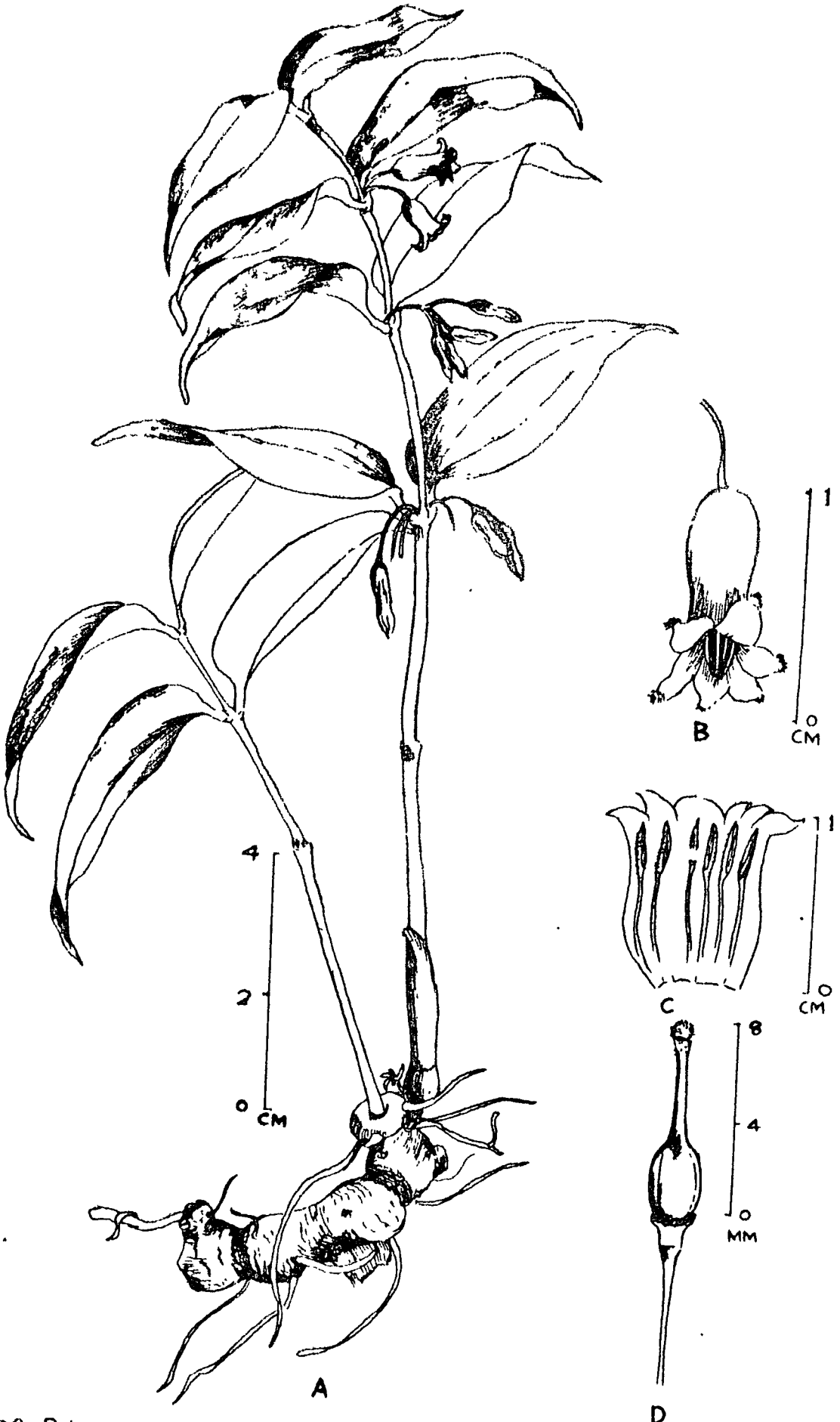


Plate 92 Polygonatum oppositifolium (Wall.) Royle A. Habit, B. Flower, C. Perianth open out, D. Pistil.

Fls. & Frts. : April to December.

Specimens examined:Myrthong 1386 Mawsmai; 1569 Shillong (Khasi Hills); 1577 Jowai (Jaintia Hills).

Smilacina Desf.

Smilacina fusca Wall. As. Rar. 3: 37. t. 257. 1832; Hook.f. Fl. Brit. India 6: 323. 1892; Hara Fl. East. Himal. 412. 1966.

Rhizomes fleshy, Stems 0.5-1 m high, glabrous. Leaves 10-20 x 5-10 cm, petioled, ovate, acute; petiole channelled. Inflorescence a lax panicle. Flowers white, pedicelled, bisexual; perianth 6, lobes short, 5-6 mm long, spreading, unequal; stamens 6, equalling the perianth lobes; anthers yellow; style short. Capsule 3-lobed, few seeded.

Rare; on banks of streams in deep forests, rhizomes firmly attached on rocks.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 1665 Shillong Peak.

Theropogon Maxim

Theropogon pallidus (Wall. ex Kunth) Maxim in Bull. Acad. St. Petersb. 15: 90. 1870; Hook.f. Fl. Brit. India 6: 324. 1892; Hara Fl. East. Himal. 2 Rep. 174. 1971. - - Ophiopogon pallidus Wall. ex Kunth Enum. 5: 300. 1850.

Vern.-' Kumtongtiang ' (K).

Tufted herbs. Scapes axillary, 4-angled, 20-50 cm high. Leaves radical, as long as scapes, 0.5-1.5 cm across. Sheaths

closed. Raceme terminal. Flowers at the axil of the linear bracts, bisexual, pinkish white, campanulate. Perianth 6, in 2-series, subequal, broadly ovate; stamens 6, adnate to the perianth tube; filaments short; anthers longer than the filaments, basifixed; style 1, stout. Capsules subglobose, brownish-pink.

Common on rocks, sometimes forming a thick cover on rocks.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1783 Parlong; 1847 Mylliem (Khasi Hills).

Tricyrtis Wall.

Tricyrtis maculata (D. Don) Macbride in Contr. Gray Herb. n.s. 53. 5. 1918; Hara Fl. East. Himal. 2 Rep. 174. 1971. - - Compsoa maculata D. Don Prodr. Fl. Nepal. 51. 1825. - - Tricyrtis pilosa Wall. Tent. Fl. Nepal. 2: 62. t. 4955. 1855; Hook.f. Fl. Brit. India 6: 359. 1892.

Vern.- ' Sohkhiamasi ' (K).

Rootstock prostrate. Stems 0.5-1 m high, pubescent. Leaves sessile, 5-10 x 3-4 cm, cordate, amplexicual, hairy. Inflorescence lax; flowers few, bisexual, mottled with violet spots all over. Perianth 6, in 2-series, usually recurved; stamens 6; filaments 2 cm long, recurved; anthers ovate, acute, basifixed; styles 2 cm long; carpels 4. Capsules 2-3 cm long, 3-valved, trigonous.

Common in pine forests especially along the banks of streams; associated with grasses and other herbaceous members.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1058 Shillong.

Tupistra Ker-Gawl.

Tuberous herbs. Leaves radical, stout, coriaceous, linear-lanceolate or oblong lanceolate, strongly nerved. Scapes axillary, short or long. Flowers in terminal spikes. Perianth 6, connate in a campanulate perigone, tube short; stamens 6-8, included; filaments short; anthers dorsifixed, incurved. Ovary 3-4-celled; style short; stigma peltate or capitate, entire or 3-6-lobed. Fruit a 1-seeded berry. Seeds large, testa thin adnate.

K E Y T O S P E C I E S

1a. Perianth segments ovate; perigone mouth closed by hemispherical stigma. . . nutans

1b. Perianth segments oblong; perigone mouth not closed by stigma. . . . . clarkei

Tupistra clarkei Hook.f. Fl. Brit. India 6: 325. 1892.

Rootstock stout, wrinkled. Roots glandulous. Leaves 50-70 x 6-12 cm, lanceolate, apex cuneate, acute. Petioles as long as the blades, channelled. Peduncles 15-20 cm long, decurved. Spikes pendulous. Flowers dense, purple, 1 x 0.8 cm, perianth 6, campanulate, mouth not closed by the stigma. Stamens 6, filaments short, adnate to the perianth tube; anthers yellow, very minute, about 2 mm long; styles long, about 1 cm long; stigma globose, Berry globose, 2 cm across.

Common in dense forests, associated with ferns and other herbaceous plants.

Fls. & Frts. : July to September.

Specimens examined: Nyrthong 1899 Mawsmai Cave; 1397 Mawmluh (Khasi Hills).

Tupistra nutans Wall. in Bot. Reg. t. 1223. 1829; Hook.f. Fl. Brit. India 6: 324. 1892; Hara Fl. East. Himal. 3 Rep. 136. 1975.

Rootstock thick. Roots glandulous. Leaves 40-80 x 4-8 cm, oblanceolate, acute, coriaceous, shining, nerves 9-11, prominent on the ventral surface, base narrowed to a long petiole. Peduncles 10-25 cm long. Spikes pendulous, 2-10 x 1-3 cm; bracts deltoid, membranous. Flowers 1 cm across. Perianth 6, purplish-brown; perianth segments ovate; perigone mouth closed by hemispherical stigma; stamens 6, connate at base; filaments very short; anthers reniform, incurved; styles as long as the perianth tube; stigma hemispheric. Berry globose, 1-2 cm across.

Common in deep forests at lower elevations.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1252 Mawmluh (Khasi Hills).

Alliaceae

J.G. Agardh 1858.

Scapigerous herbs without distinct above ground stems. Bulbs tunicate, clothed with fleshy scale-leaves and dry scales. Leaves few to numerous, subdistichous or spirally arranged, mostly radical, fistular or flat. Scapes elongate during flowering. Flowers crowded in truncate or hemispherical head. Bracts membranous. Perianth 6-partite, connate at base, petaloid. Stamens 6, adnate to the perianth segments; filaments as long as or much exserted from the perianth lobes; anthers minute, 2-celled; ovary 3-celled, few to many-ovuled; style fleshy; stigma 3-fid or minutely 3-lobed.

Fruit a loculicidal capsule. Seeds compressed or not.

Allium Linn.

Characters of the family.

K E Y T O S P E C I E S

1a. Bulbs scaly; leaves hollow cylindric; cymes dense flowered; bulbils present. . . . . cepa

1b. Bulbs tunicated or scaly; leaves flat; cymes lax flowered with or without bulbils.

2a. Bulbs cylindric; cymes bearing flowers only. . . . . chinense

2b. Bulbs spherical or cylindric; cymes bearing both flowers and bulbils.

3a. Bulbs tunicated, much swollen. . sativum

3a. Bulbs scaly, not swollen. . . . clarkei

Allium cepa Linn. Sp. Pl. 300. 1753; Hook.f. Fl. Brit. India 6: 337. 1892;

Vern. - ' U Piat ' (K).

Bulbs clothed with red or reddish pink membranous scales. Leaves subdistichous, fistular, shorter than the scapes, 5-8 mm across. Scapes 20-50 cm high, elongating during flowering. Flowers clustered in the umbellate heads at the apex of the scape. Perianth 6, linear-oblong, white, connate at base; stamens 6; filaments exserted, simple or inner 2-toothed at the base; ovary 3-celled;

style filiform, thicker towards the base; stigma 3-lobed. Capsule small, loculicidal.

Cultivated throughout Meghalaya, for their bulbs and leaves which are eaten.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 2950 Shillong.

Allium chinense G. Don Monogr. Allium 83, 1827; Hara Fl. East. Himal. 405. 1966. - - A. bakeri Regel. in Act. Hort. Petrop. 3: 341. 1875; Hook.f. Fl. Brit. India 6: 341. 1892.

Vern.- ' Jyllang ' (K).

Bulbs clustered, clothed with white scales. Leaves numerous, radical, narrowly linear, 15-20 x 0.5 cm, deep green, apex sub-acute. Scapes 20-30 cm high, slender, fistular. Flowers in umbellate heads; bracts scarious. Pedicels 1-2 cm long. Flowers 6-8 mm across; perianth purple, 6-lobed, ovate; filaments filiform, much longer than the perianth lobes; anthers yellow, basifixed. Ovary 3-celled; style filiform, much longer than the perianth and stamens; stigma minute. Capsule hemispherical.

Cultivated for their edible bulbs which are mostly used as a spice.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1195 Shillong.

Allium clarkei Hook.f. Fl. Brit. India 6: 344. 1892.

Vern.- ' Jaud'' (K).

Roots tufted, fleshy. Leaves radical, 20-30 x 0.5-1 cm, flat, deep green, apex acute, base overlapping, midrib prominent. Scapes 1-3 together in each clump, cylindric, hollow, as long as or longer than the leaves. Umbellate heads 2-3 cm across. Flowers dirty white, 4 mm across; perianth 6, in 2-series, subequal, 2-3 mm long, linear-lanceolate. Stamens 6, adnate to the perianth segments; filaments 2 mm long; anthers much shorter than the filament; ovary 3-celled, subglobose or subconic; style filiform; stigma minute. Capsule loculicidal. Seeds few, compressed.

Cultivated for the leaves which are mostly used for flavouring curry. Originally wild in West Khasi Hills and now introduced and cultivated in gardens.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1810 Pariong (Khasi Hills).

Allium sativum Linn. Sp. Pl. 300. 1753; Hook.f. Fl. Brit. India 6: 337. 1892.

Vern.- ' Runsun ' (K), 'Rasin-gipok' (G).

Bulbs tunicated, clothed with white, membranous scales. Leaves flat, 15-30 x 0.6-1 cm, subulate, apex subacute. Scapes longer than leaves. Umbellate heads spherical or globose; flowers crowded. Pedicels as long as the flowers. Flowers white; perianth 6, lanceolate; stamens 6, adnate to the base of the perianth tube, or at the base of the perianth segments; filaments longer than the perianth, exserted; anthers yellow or blackish green; ovary 3-celled.

styles fleshy, thickened towards the base; stigma 3-fid. Capsules loculicidal, many seeded.

Cultivated for their leaves and bulbs which are used for flavouring curry. The bulbs are also used as a medicine against cough, by many villagers.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 2951 Shillong.

Amaryllidaceae

J. St. Hilaire, Expos. Fam. 1: 134. 1805.

Perennial herbs. Stems usually naked, herbaceous, rarely woody. Leaves distichous or spiral. Flowers few, usually umbellate sometimes racemose. Bracts membranous. Perianth 6, in 2-series, sometimes with a corona at the mouth of the tube. Stamens 6, connate at the base of the perianth segments; filaments expanded at base into corona-like structures; anthers versatile; ovary inferior, 3-celled; styles stout or slender; stigma simple or cleft; ovules numerous, in 2-seriate on the inner angles of the cells. Fruit a loculicidal capsule, rarely a berry; seeds few or many.

K E Y T O G E N E R A

1a. Scapes stout, 1-3 cm across, bearing few to many flowers; leaves broad, 2-10 cm across; flowers white or creamy white. . . . . Crinum

1b. Scapes small, slender, 2-8 mm across, bearing solitary flowers; leaves 0.6-1 cm across; flowers white or rose pink. . . . . Zephyranthes

Crinum Linn.

Herbs with tunicated bulbs. Leaves long, ensiform. Flowers showy, in umbels, sessile or shortly stalked, embraced by 2 spathe-like bracts at the apex of a long, solid scape. Perianth 6, connate in a salver or funnel-shaped perigone, recurved or spreading; stamens 6, connate at base; filaments filiform; anthers versatile or dorsifixed. Ovary inferior, 3-celled; ovules few to many in each cell. Styles filiform; stigmas minute, subcapitate. Capsules irregularly subglobose, membranous or coriaceous. Seeds few, large, rounded; testa thick.

K E Y T O S P E C I E S

1a. Leaves broad, 5-10 cm across; umbels 15-20-flowered; perianth lobes ovate. . . . . asiaticum

1b. Leaves narrow, 1-3 cm across; umbels 6-12-flowered; perianth lobes linear or oblong. . . . . pratens

Crinum asiaticum Linn. Sp. Pl. 292. 1753; Hook.f. Fl. Brit. India 6: 280. 1892; Babu Herb. Fl. Dehra Dun 509. 1977.

Rhizomes stout, elongated, white, 4-5 cm across, clothed with fleshy scaly-leaves, narrowed into cylindrical neck. Scapes 1 m high. Leaves many, spirally arranged on the scapes, acute. Flowers in umbels; bracts 2, yellow or straw coloured about 10 cm long, many nerved. Flowers white, 10-15 x 4-5 cm, perianth tube long, up to 15 cm long, perianth lobes reflexed, purplish white; anthers yellow; styles filiform, pink in the upper portion and white in the lower portion; stigma 3-lobed.

Cultivated in gardens as an ornamental. It is also reported to have a medicinal value.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 3023 Shillong; 1726 Burnihat (Khasi Hills).

Crinum pratens Herb. Amaryll. 256. 1837; Hook.f. Fl. Brit. India 6: 282. 1892; Babu Herb. Fl. Dehra Dun 509. 1977.

Vern.- ' Jaleikyap ' (K).

Bulbs ovoid, 3 cm across, clothed with fleshy sheaths. Scapes 30-50 cm high. Leaves radical, in rosettes, as long as scapes, usually radiating on the ground, glabrous, channelled, about 3 cm across, obtuse. Peduncles 4-8 cm long. Flowers pure white, 6-8 cm across. Perianth lobes linear, reflexed, oblong or clavate. Filaments fleshy, brown; anthers yellow reflexed, dorsifixed; styles as long as the stamens or much longer; ovary clavate; stigma 3-fid. Capsules ellipsoid, 5-8 cm long.

Common along the banks of rivers, streams etc.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 1634 Sohkha (Jaintia Hills).

Zephyranthes Herb.

Herbs with tunicated bulbs. Leaves radical, linear, strap-shaped. Scapes as long as or longer than leaves, slender. Flowers solitary, sessile or stalked, terminal on hollow scapes, embraced by entire or 2-fid, spathe-like bracts. Perianth 6, connate at base. Stamens 6, adnate to the perigone throat. Ovary inferior, 3-celled; ovules many; styles filiform. Fruit a capsule.

K E Y T O S P E C I E S

1a. Flowers white or whitish yellow . . candida

1b. Flowers pink or rose coloured. . . grandiflora

Zephyranthes candida Traub. in Plant Life 7: 42. 1951.

Corm 1-2 cm across, clothed with brown or scarious scales. Leaves radical, 4-6, linear 40-50 x 05-0.8 cm, obtuse or rounded at the apex. Scapes shorter than leaves. Flowers bisexual, bracts 1-3 cm long. Perianth 6, tube 2-3 cm long, bluish white or whitish yellow, lobes deltoid. Stamens 6; filaments 2-2.5 cm long; anthers 1-1.5 cm long, yellow, cuneate; styles as long as t e stamens or longer; stigma 3-lobed.

Cultivated, but frequently seen as an escape.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1745 Shillong; 1892 Mawsmai (Khasi Hills).

Zephyranthes grandiflora Lindl.: Bot. Reg: t. 902: 1825; Babu Herb. Fl. Dehra Dun 511: 1977.

Rhizomes 4 cm across. Leaves flat, 16-20 x 0.5-0.6 cm, glabrous, with distinct midrib. Scapes 15-20 cm high. Bracts 5 cm long. Flowers 6 x 3 cm, solitary, pink or rose-coloured. Perianth 6, connate at base, 6 cm long, acute, many nerved; stamens 6, filaments filiform, 1-2 cm long; anthers as long as the filaments or shorter, dorsifixed. Carpels 3, inflated, as long as the perianth lobes.

Cultivated in gardens for their showy flowers.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1661 Shillong.

The following species are also cultivated in Meghalaya for their showy flowers,-

Pancratium triflorum Roxb. (fragrant flowers).

Sprekelia formosissima Herb. (yellow flowers).

Zephyranthes rosea (Spreng.) Lindl. (Pink or rose flowers).

Zephyranthes tubespatha (Ker.) Herb. (yellow flowers).

Asparagaceae

A. L. de Juss. 1789.

Erect or climbing herbs or undershrubs. Rhizomes stout, creeping. Leaves minute, scale-like, bearing a tuft of linear or acicular cladodes in the axils. Flowers bisexual, rarely unisexual, in racems or panicles. Pedicels jointed; bracts minute or obsolete. Perianth 6-partite, petaloid. Stamens 6, adnate to the base of the perianth lobes; filaments free; anthers oblong. Ovary 3-celled; ovules 2 or more in each cell; stigmas 3-fid, recurved. Berries globose. Seeds 2-6, testa black, fragile.

Asparagus Linn.

Characters of the family.

K E Y T O S P E C I E S

1a. Cladodes terete or triquetrous; subulate, finely acuminate. . . racemosus

1b. Cladodes flattened, linear, apex acute. . . . . gonoclados

Asparagus gonoclados Baker in Journ. Linn. Soc. Bot. 14: 627. 1875; Hook.f. Fl. Brit. India 6: 318. 1892.

Rhizomes tuberous. Stems scandent, highly branched; branches angled, spiny. Cladodes 2-6-nate, falcate, 1-3 x 0.1-0.2 cm, acute. Racemes solitary, 1-3 cm long, few to many flowered; bracts

small, cymbiform; flowers bisexual, regular, pedicellate; perianth spreading, pinkish-white; stamens equalling the perianth; styles short, conical. Berry deep blue when ripe.

Cultivated for their deep green cladodes.

Fls. & Frts. : June to January.

Specimens examined: Myrthong 3041 Shillong.

Asparagus racemosus Willd. Sp. Pl. 2: 152. 1799; Hook.f. Fl. Brit. India 6: 316. 1892; Hara Fl. East. Himal. 405. 1966; Babu Herb. Fl. Dehra Dun 517. 1977.

Rootstock stout. Stems scandent, terete; branches triquetrous, arising in the axils of spines. Cladodes linear, slightly triquetrous, finely acuminate, 0.5-2 cm long, crescent-shaped. Racemes with terminal tufts of cladodes. Perianth 6, in 2-series, purplish or whitish purple; stamens 6, adnate to the base of the perianth segments; anthers yellow; styles short; stigmas 3. Berry globose, glaucous.

Rather rare; climbing on small trees and bushes in fallows.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1987 Nay to Baghmara (Garo Hills).

Hypoxidaceae

R. Br. in Flinders Voy. Terra Austr. 2: 576. 2824.

Perennial herbs with tuberous rootstock, or tunicate, fibrous or membranous corms. Leaves radical, strongly nerved. Flowers solitary or racemose, or umbellate; bracts small, linear or obsolete.

Perianth rotate, persistent. Stamens 6, adnate to the base of perianth segments; filaments short; anthers erect, dorsifixed; ovary inferior, 3-celled; ovules numerous; styles short, columnar; stigmas 3, erect, stout, distinct or connate. Fruit a globose or oblong capsule, opening by 3-valves; seeds globose, shining, beaked at the tip.

K E Y T O G E N E R A

1a. Flowers crowded in subcapitate cymes; ovary produced into a short or long stipe above the crown. . . . . Curculigo

1b. Flowers solitary; ovary not produced into a stipe above the crown. . . . Hypoxis

Curculigo Gaertn.

Curculigo capitulata (Lour.) Kuntz. Rev. Gen. Pl. 2: 703. 1891; Hara Fl. East. Himal. 418. 1966 - - Leucoium capitulatum Lour. Fl. Coch. 199. 1790. - - Curculigo recurvata Dryand. in Ait. Hort. Kew ed. 2, 2: 253. 1811; Hook.f. Fl. Brit. India 6: 278. 1892.

Vern.- ' Lakot ' (K).

Rootstock elongated, stout. Scapes angular, tomentose. Leaves 30-100 x 4-10 cm, acute, lanceolate, plicate, tomentose, or glabrous, distinctly nerved. Flowers crowded in decurved subcapitate racemes; bracts lanceolate, acute, about 1-2 x 0.8 cm; perianth 6, in 2-series, outer segments curved, villous at the back, inner segments yellow, petaloid. Stamens 6, equal, connate at base; stigma obscurely 3-lobed; ovary villous. Seeds black, shining, deeply grooved.

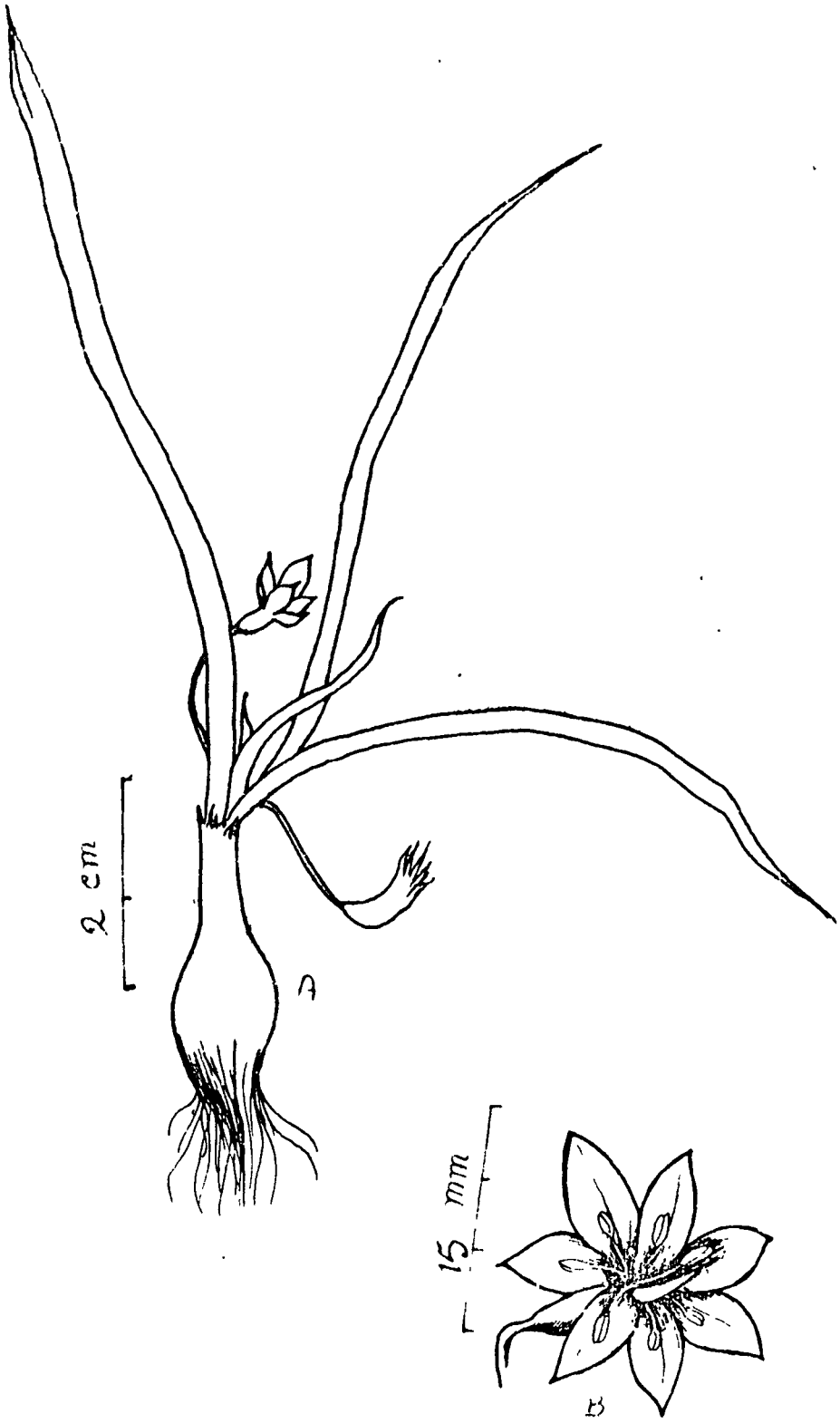


Plate 93 Hypoxis aurea Lamk. A. Habit, B. Flower (top view).

Common undergrowth in deciduous forests and also in pine forests, specially in wet and shady places.

Fls. & Frts. : May to December.

Specimens examined: Myrthong 1173 Shillong; 1686 Burnihat (Khasi Hills); 1933 Tura Peak (Garo Hills).

Hypoxis Linn.

Hypoxis aurea Lour. Fl. 200. 1790; Hook.f. Fl. Brit. India 6: 277. 1892; Hara Fl. East. Himal. 419. 1966; Jain in Rec. bot. Surv. India 20(2): 223. 1973 (Plate 93).

Rootstock bulbous, coated with fibrous remains of old leaves. Scapes short, filiform, 3-10 cm high. Leaves linear, acute, very hairy, 3-12 x 0.4-0.5 cm, channelled. Flowers solitary, sparsely clothed with pale brown hairs; bracts setaceous. Perianth 6, in 2-series, 6 mm long, acute, elliptic-lanceolate, yellow, outer 3-segments, green at the back; stamens 6, adnate to the base of the the perianth lobes; filaments longer than the sagittate anthers; carpels 1; ovary clavate, 0.5-1 cm long, clothed with golden-brown, short, shining hairs. Capsules oblong, 1 cm long, 3-valved, crowded with persistent perianth segments. Seeds black, tuberculate.

Common in open areas, in association with grasses and also occurs in pine forests and patches of lands in deep forests.

Fls. & Frts. : May to October.

Specimens examined: Myrthong 1836 Pariong; 1653 Shillong (Khasi Hills).

Iridaceae

A. L. de Juss. Gen. Pl. 57. 1789.

Perennial herbs, usually with bulbs, corms or sometimes rhizomes. Leaves radical, sometimes cauline, narrow, often distichous, equitant with sheathing bases, no demarcation between blade and petiole. Flowers bisexual, bracteate, solitary or in cymose or racemose inflorescences. Perianth 6, in 2-series, petaloid, imbricate, connate in long or short tube. Stamens 3, adnate to the base of the outer perianth segments; filaments free or partially united; anthers narrow, extrorse. Ovary 3-celled, ovules numerous in each cell; styles simple; stigmas 3-lobed or 3-partite, simple or petaloid or variously cleft. Fruit a trigonous, loculicidal capsule. Seeds numerous, embryo immersed in albumen.

K E Y T O G E N E R A

1a. Stamens opposite to and shorter than the petaloid style-arms. . . . . Iris

1b. Stamens not as above.

2a. Flowering scapes never branched; flowers developing at the axils of upper leaves. . . . . Gladiolus

2b. Flowering scapes branched at anthesis.

3a. Leaves twisted at the base; leafy stems not laterally compressed; flowers secund on bi-furcated rachis. . . . . Freesia

3b. Leaves not twisted; leafy stems laterally compressed; flowers spirally or distichously arranged on many branched rachis. . . . . Crocosmia

Crocosmia Planch.

Crocosmia aurea Planch.

Rhizomes bulbous, woody, covered with scale leaves, 2-3.5 cm across. Leaves on each node, 30-40 x 2 cm, linear-lanceolate, acute, many-nerved. Inflorescence a raceme. Flowers sessile, subtended by bracts, alternate on zigzag rachis. Flowers yellow or bright orange, 2.5 x 1 cm; bracts 2, 5 mm long, cymbiform, acute. Perianth 6, in 2-series; outer 3, smaller or unequal; inner 3, adnate at base. Stamens 3, filaments filiform, 1.5-2 cm long; anthers 6 mm long, sagittate, 2-celled; styles filiform; carpels as long as the perianth lobes; stigma 2-fid.

Common in forests mainly as scapes.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1059 Shillong.

Freesia

Freesia refracta (Jacq.) Klatt Linnaea 34: 673. 1865; Babu Herb. Fl. Dehra Dun 506. 1977 (Plate 94).

Scapes twisted, 40 cm high. Leaves equalling the flowering scapes, 5-8 mm across, acute, narrowed at base; sheaths hyaline, midrib distinct, lateral ones smaller than the midrib. Racemes secund. Flowers brancteate; perianth yellowish or creamy, slightly 2-fid. Stamens 3, filaments filiform; anthers elongated, recurved. styles shorter than the perianth lobes, carpels 6, reflexed.

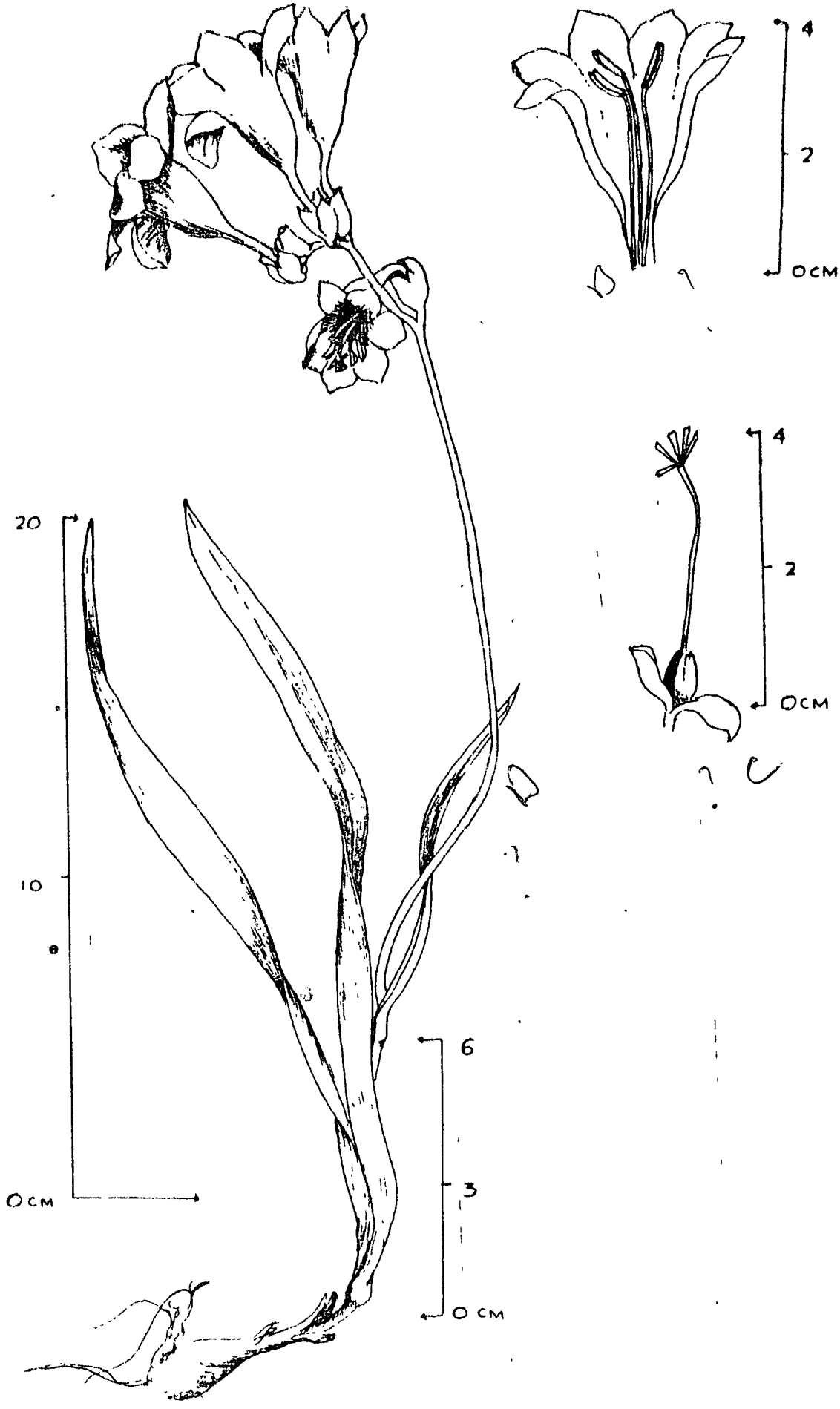


Plate 24 Freesia refracta (Jacq.) Klatt. A. Habit, B. Perianth open out, C. Pistil.

Cultivated in gardens as a pot herb mainly for their showy flowers.

Fls. & Frts. : February to October.

Specimens examined: Myrthong 1497 Shillong.

Gladiolus Linn.

Gladiolus aureus Baker in Journ. Bot. 333. 1876.

Vern.- ' Tiewkyntangbiri ' (K).

Rhizomes indistinct. Scapes 1 m high. Leaves distichous, 20-50 x 2-3 cm, ensiform, many ribbed, apex oblique, acute, sheathing; upper leaves reduced to bracts. Flowers funnel-shaped, sessile, 8xx 4 cm, subtented by 2 bracts. Bracts cm long, lanceolate, acute. Perianth 6, broad, lower portion united forming a tube, upper portion free, broad, 2-5 cm across, rounded, lower 3, smaller 3 x 1 cm, yellow. Stamens 3; anthers 1.5 cm long, 2-celled; filaments 5 cm long, shorter than the perianth lobes. Carpels 3, broad; stigmas hairy.

Cultivated in gardens as an ornamental.

Fls. & Frts. : July to January.

Specimens examined: Myrthong 1906 Shillong.

Iris Linn.

Rhizomatous herbs. Leaves ensiform, equitant, mostly radical. Flowers bisexual, zygomorphic, 2 or more in spathe, rarely solitary in lax corymb-like inflorescence. Perianth 6, the outer 3

erect or bent, clawed; the inner 3, smaller, all connate at base in a short tube. Stamens 3, adnate to the outer perianth segments; filaments free, rarely adnate to the styles. Ovary 3-celled, inferior, cells many-ovuled. Style arms 3, winged, petaloid, 2-fid, embracing the anthers; lobes stigmatic within. Fruit a 3-4-ribbed, or triangular capsule.

Iris nepalensis D. Don Prodr. 54. 1825; Hook.f. Fl. Brit. India 6: 273. 1892.

Rhizomes prostrate, 1 cm across, marks of fallen leaves above. Culms short, 20-40 cm high, jointed above. Leaves distichous, 2-3, on each side, flat, ensiform, glabrous, acute, sheathing at base, 25-30 x 2-3 cm, narrowed towards the base, margin hyaline. Inflorescence a raceme of few flowers. Bracts 1-2 cm long, ovate, acute. Flowers blue or lilac with yellow crest in the inner face of the outer perianth segments. Perianth 6, in 2-series; outer 3, larger 2-2.5 x 1-2 cm, oblong, crested with yellow and violet stripes on the inner face, sparsely hairy on the crest, apex rounded; inner 3, smaller, linear-oblong, lilac or blue. Stamens 3, filaments 1 cm long, filiform; anthers shorter than the filaments, auneate, white. Carpels 3, petaloid, 3-3.5 cm long, 2-fid, stamens on the groove of the carpel; ovary 3-celled, with 3-rows of ovules.

Cultivated in gardens for their beatiful lilac flowers, often seen as escapes.

Fls. & Frts. : March to June.

Specimens examined: Myrthong 2947 Shillong.

The folowing species are also seen under cultivation in various gardens of Meghalaya.

1. Crocus sativus Linn. (cultivated for their conspicuous flowers and also for their medicinal value).
2. Iris germanica and I. graminea (cultivated for their showy yellow and black spotted flowers).
3. Iris pallida Lamk. (cultivated for deep violet flowers).
4. Iris wattii Baker (cultivated for their showy flowers and leaves).

Agavaceae

Endlicher Ench. Bot. 105. 1841.

Shrubs with short woody stems. Leaves thick, fleshy, crowded at the apices of the stems, margin entire or serrate. Flowers solitary or in fascicles or paniculate on a long pole-like scapes. Perianth funnel-shaped, tube short or long; stamens 6, adnate to the base of perianth segments, usually longer than the latter; ovary inferior or superior; ovules 2-seriate; styles more or less long; stigma 3-lobed. Flowers often replaced by numerous viviparous bulbils in scapes. Fruit a leathery, loculicidal capsule. Seeds obliquely flat.

K E Y T O S P E C I E S

1a. Leaves entire; perianth polyphyllous; ovary superior. . . . . Yucca

1b. Leaves serrate, or entire; perianth gamophyllous; ovary inferior.

2a. Leaves serrate; flowers in a pole-like scape, often replaced by bulbils. . . . . Agave

2b. Leaves entire; flowers not as above; bulbils absent. . . . Dracaena

Agave Linn.

Agave sisalana Perr. ex Englem. in Trans. Linn. Acad. Sci. St. Louis 3: 316. 316-318. 1873.

Stems stout, short. Leaves 30-100 x 10-15 cm, in rosettes, serrate or spinous, striped yellow near the margin. Inflorescence on long pole-like scapes, up to 3 m high. Flowers 5 cm long, cuneate; perianth 6, in 2-series, subequal; outer oblong, 1.2 x 0.4 cm, greenish white, apex rounded with tufted hairs at the tip. Stamens 6, equalling the perianth, linear; filaments short; ovary inferior; ovules 2-seriate; styles shorter than stamens; stigma inflated, 3-lobed. Fruit a loculicidal capsule. Seeds compressed.

Grown in gardens as an ornamental for their fleshy leaves and large inflorescences; often planted as hedges.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1894 Cherrapunjee (Khasi Hills).

Dracaena Linn.

Shrubs or small trees with woody stems. Leaves long, linear, or ovate-lanceolate, crowded or alternate, subterminal, sessile or petioled. Flowers in terminal racemes or panicles. Perianth tubular or campanulate, cylindric, 6-partite, petaloid. Stamens 6,

adnate to the base of the perianth tube; filaments filiform or flattened; anthers versatile. Ovary 3-celled; ovule 1, erect. Style filiform; stigma capitate. Berries globose or distinctly 3-lobed. Seeds globose or angular.

K E Y T O S P E C I E S

1a. Stems branched above; leaves ovate-lanceolate, sparsely arranged on branches and branchlets; flowers on branchlets . . . . . elliptica

1b. Stems unbranched; leaves linear, crowded near the apex of the stems; flowers at the apex of stems .

2a. Leaves 40-60 x 2-3 cm; perianth lobes equal. . . . . angustifolia

2b. Leaves 20-30 x 5-6 cm; perianth lobes subequal. . . . . spicata

Dracaena angustifolia Roxb. Fl. Ind. 2: 155. 1832; Hook.f. Fl. Brit. India 6: 327. 1892; Majumdar in Rec. bot. Surv. India 20(2): 225. 1973.

Stems woody, 2-5 m high. Leaves linear, 40-60 x 2-2.8 cm, finely acuminate, crowded at the apex of the stems, base narrowed; sheaths overlapping. Inflorescence spicate, at the apex of stems. Bracts leafy. Flowers 0.5-1 cm long, white. Pedicel 1 cm long; perianth 6, equal, apex rounded, connate in the lower portion, white, with purplish tip. Stamens 6, adnate to the inner face of the perianth; anthers longer than filaments; styles filiform. Berries globose or spherical, 5-8 mm across, bluish green when ripe.

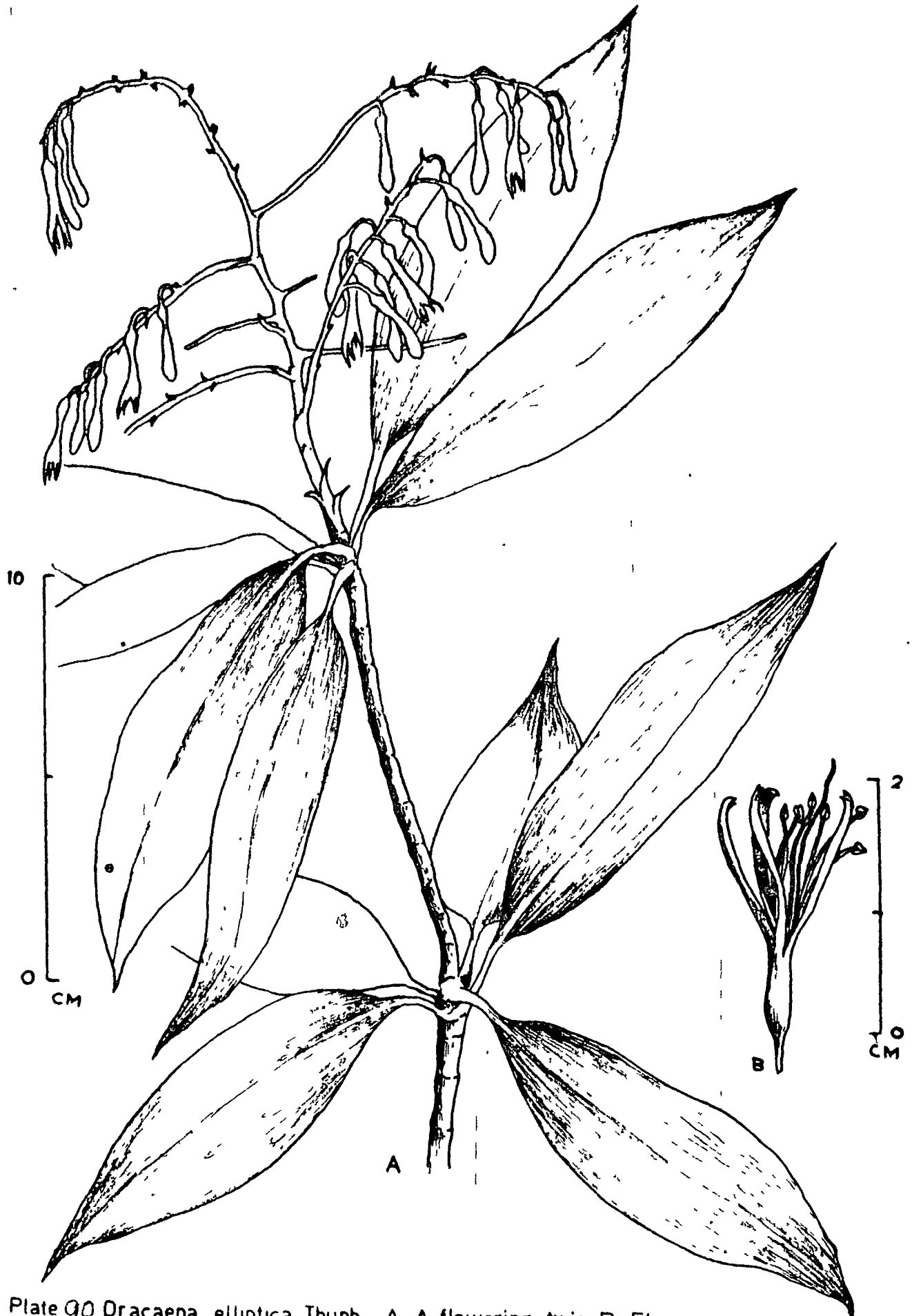


Plate 90 Dracaena elliptica Thunb. A. A flowering twig, B. Flower.

Common in deep forests forming shrub layer.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1288 Sohkha (Jaintia Hills); 3132 Tura Peak (Garo Hills).

Dracaena elliptica Thunb. Diss. Bot. Dracean. 6·1799; Hook.f. Fl. Brit. India 6: 330. 1892 (Plate 90).

Stems tall, woody, 5-10 m high, highly branched. Branches with scars of fallen leaves. Leaves 12-16 x 4-5 cm, ovate-lanceolate, base cuneate, acute at apex. Petiole 1-2 cm long. Inflorescence a panicle or raceme, at the apices of branchlets. Flowers pedicelled, white, linear, 2-3 x 0.2-0.3 cm, obtuse; perianth 6, connate. Stamens 6, adnate to the perianth tube; filaments filiform, 1 cm long, anthers yellowish-white, versatile, about 2 mm long; styles long, 3 cm long; stigma capitate.

Rare; collected only once from Baghmara.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 3138 Baghmara (Garo Hills).

Dracaena spicata Roxb. Fl. Ind. 2: 157. 1832; Hook.f. Fl. Brit. India 6: 328. 1892.

Stems erect, woody, 3-5 m high. Branches with distinct marks of circular rings. Leaves 20-30 x 5-6 cm, broadly oblong-lanceolate, or elliptic, finely acuminate, base cuneate; nerves distinct on dorsal face only; petioles 4-8 cm long, not clearly demarcated from the blade, sheathing at base. Spikes terminal, 30 cm long.

Flowers white, 1 cm long; perianth 6, in 2-series, subequal, connate at base. Stamens 6, connate in the perianth tube; anthers versatile. Ovary 3-celled with 1-ovule in each cell; style short, filiform. Fruit a 3-seeded berry, bluish green when ripe, deciduous.

Common in deep forests at foot Hills.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1289 Sohkha (Jaintia Hills); 3103 Burnihat (Khasi Hills); 3119 Tura foot hills (Garo Hills).

Yucca Linn.

Yucca gloriosa Linn. Sp. Pl. 319. 1753.

Stems stout with scars of leaf bases. Leaves spirally arranged, ensiform, fleshy, glaucous, upto 1 m long and 15 cm across, margin entire, tip sharp-pointed. Flowers creamy white, as big as hen's egg; bracts about 15 cm long; perianth 6, in 2-series, 5 x 3 cm, ovate, acute with distinct dichotomous nerves and cross nerves; outer segments orbicular, shorter than the linear inner segments; stamens 6, anthers fleshy, 2 cm long, filaments shorter than anthers; style 1, 2 cm long; stigma 3-lobed. Fruit a berry, or a capsule.

Cultivated in gardens for their evergreen ensiform leaves and for their large, erect, creamy white inflorescences which remain long.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 3050 Shillong.

Haemodoraceae

R. Br. Prodr. 1: 299. 1810.

Perennial herbs. Leaves radical, distichous, narrow with equitant sheaths. Flowers bisexual, regular, in terminal spikes, racemes or panicles. Perianth 6, in 2-series, both series corolline. Stamens 6 or fewer, more or less adnate to the perianth lobes; anthers versatile, 2-celled. Styles filiform; stigma simple or 3-partite. Ovary inferior or subinferior, perfectly or imperfectly 3-celled; ovules 1 or more, attached to the inner angle of the cells. Fruit a loculicidal capsule or a berry. Seeds variable; embryo partially enclosed in fleshy albumen.

K E Y T O G E N E R A

1a. Ovary cells many-ovuled. . . . . Aletris
1b. Ovary cells 1-2-ovuled.
  2a. Leaves broadly lanceolate, subplicately nerved; filaments connate in a ring closing the mouth of the perianth. . . . . Peliasanthes
  2b. Leaves linear; filaments free not closing the mouth of the perianth. . . . . Ophiopogon

Aletris Linn.

Aletris khasiana Hook.f. Fl. Brit. India 6: 265. 1892.

Vern.-' Kumtongtiang ' (K).

Rhizomes short. Leaves radical, tufted, linear, 10-25 x 0.4-0.6 cm, many-nerved, apex rounded, base sheathing. Scape slender,

shorter than the leaves, few flowered. Bracts scarious, 5-8 mm long, acute, ultimately white when dry. Flowers sessile, pinkish or purple; perianth segments 6, connate in a subcampanulate tube, 8 mm across. Stamens 6, adnate to the base of the perianth lobes; filaments very short; anthers oblong, as long as or shorter than the perianth lobes. Ovary semi-inferior, 3-celled, stigmas 3-fid. Fruit a 3-valved, loculicidal capsule. Seeds minute, reniform.

Rare; on rocks in open places and secondary forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2958 Laitlyngkot (Khasi Hills).

Ophiopogon Ker-Gawl.

Scapigerous herbs. Stems short from rootstock or elongated. Leaves linear, usually radical. Scapes leafy or leafless, few-flowered. Bracts scarious, usually many-flowered. Perianth superior, spreading. Stamens 6, adnate to the base of the perianth lobes; filaments short, erect; anthers basifixed. Ovary inferior, 3-celled; styles columnar, stigma 3-lobed; ovules 2 in each cell, anatropous. Fruit a berry. Seeds few, fleshy or succulent.

K E Y T O S P E C I E S

1a. Stems prostrate with distant tufts of leaves on each node. . . . . reptans

1b. Stems not prostrate, with radical or subradical leaves only.

2a. Rootstocks stout up to 4 cm across. . . . . wallichianus

2b. Rootstocks slender. . . . . intermedius

Ophiopogon intermedius D. Don Prodr. Fl. Nepal. 48. 1825; Hook.f. Fl. Brit. India 6: 269. 1892; Hara Fl. East. Himal. 409. 1966. - - Mondo intermedium (D.Don) Bailey Gen. Herb. 2: 25.f. 12. 1929.

Vern.-' Sohkyrwat ' (K).

Rootstock short or sometimes prostrate. Stems tufted. Leaves linear, 20-30 x 0.4-0.6 cm, glabrous, apex acute. Flowering scapes as long as or shorter than the leaves. Flowers solitary or in fascicles, 1-1.5 x 1 cm, pale pink or white. Perianth 6, in 2-series, perianth tube campanulate. Stamens 6, filaments 2 mm long; anthers 4-6 mm long, cuneate, deep yellow, subconnate and surrounding the style. Style as long as anthers; stigma subcapitate. Berries ellipsoid, blue when ripe.

Common both in pine and broad leaved forests, specially on slopes and along the banks of streams. A very variable species with respect to size.

Fls. & Frts. : August to April.

Specimens examined: Myrthong 1828 Markasa; 1849 Mylliem (Khasi Hills).

Ophiopogon reptans Hook.f. Fl. Brit. India 6: 268. 1892;

Stems 30-60 cm long, prostrate, rooting at the nodes with tufts of leaves at each node; upper tuft of leaves with membranous white scales at base, concealing the leaf bases. Leaves tufted, linear, 20-30 x 0.1-0.2 cm, coriaceous, shining, all recurved

to one side; apex rounded or truncate, margin scabrid. Scapes 5-10 cm high, concealed in between the tuft of leaves, few-flowered. Bracts shorter than flowers; flowers shortly pedicelled, 2-5 mm long, campanulate, purplish-white, 6 mm across. Perianth 6, in 2-series. Stamens 6, filaments short, adnate to the perianth segments; anthers shorter than the perianth segments; style 1, Capsules ellipsoid, deep blue at maturity.

Common along the banks of streams and rivers, on exposed rocks.

Fls. & Frts. : January to October.

Specimens examined: Myrthong 3110 Garumpani (Jaintia Hills); 2944 Sunapahar (Khasi Hills).

Ophiopogon wallichianus (Kunth) Hook.f. Fl. Brit. India 6: 268. 1892. - - Fluggea wallichiana Kunth Enum. Pl. 5: 303. 1850.

Vern. '-Sohkyrwat ' (K).

Rootstocks stout, 5-15 x 1-5 cm. Leaves tufted, 20-50 x 0.5-1 cm; linear, apex rounded, margin minutely erose. Scapes shorter than leaves, few flowered. Bracts linear, 0.5-1 cm long. Pedicels 5 mm long, jointed near the base. Flowers purplish or lilac, 1 cm across, campanulate. Perianth 6, subequal, in 2-series; stamens 6, adnate to the base of perianth lobes; filaments short; anthers subulate, as long as or shorter than the perianth lobes; styles slender, tapering from thick base towards the apex. Capsules ellipsoid, deep blue at maturity, glaucous.

Common in forests, along the ridges in hill tops, very similar to O. intermedius, except for the stout, elongated root-

stocks and larger flowers. It is observed that both plants often grow together and those parts of the rootstock reaching the soils become condensed, whereas those growing on rock show thick and elongated rootstocks. Hence, these two species may form only 2 ecotypes of the same species.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1765 Shillong.

Peliasanthes Adr.

Herbs with short rhizomes and broad or lanceolate, radical leaves, subplicately nerved. Scapes erect, few-flowered. Bracts scarious. Flowers shortly stalked or sessile in spikes. Perianth broadly campanulate, 6-lobed, subequal, spreading. Stamens 6; filaments shortly connate in a ring of the perigone throat. Ovary inferior, 3-celled; ovules 2 in each cell; stigma sessile, 3-lobed. Fruits berry-like. Seeds few, fleshy or succulent; embryo basal.

K E Y T O S P E C I E S

1a. Bracts 1-flowered. . . . . violaceae

1b. Bracts more than 1-flowered. . . teta

Peliasanthes teta Andr. Bot. Rep. 605. 1810; Hook.f. Fl. Brit. India 6: 265. 1892.

Leaves 20-30 x 5-8 cm, lanceolate, acuminate, narrowed into long petioles, many-nerved; base cuneate. Flowering scape as long as leaves; bracts 1-3 in each fascicle, triangular, scarious, 5-6

mm long, acute. Flowers many, purplish green, 1 cm across. Pedicels 5 mm long, or sometimes sessile. Perianth 6, persistent, campanulate, orbicular. Stamens 6, filaments short, united into a fleshy ring, closing the mouth of perianth; anthers white. Ovary 4-celled, sub-basal. Styles short; stigma 3-lobed. Berries indehiscent, elliptic, blue when ripe.

Common in forests.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 3122 Lailad (Khasi Hills).

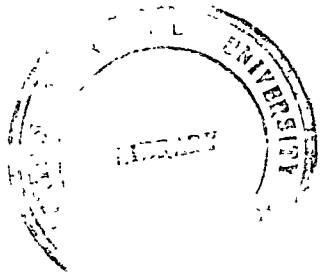
Peliasanthes violacea Wall. ex Hook.f. Fl. Brit. India 6: 266. 1892.

Roots woody, branched. Rootstock thickened, clothed with dry sheaths. Leaves petioled, blades 20-30 x 4-6 cm, lanceolate, many-nerved; petioles as long as blades; scapes half the length of petioles, recurved, or straight, many-flowered. Bracts scarious, 6 mm long, 1-flowered. Flowers 6-8 mm across, purplish; perianth 6, in 2-series; outer 3 larger than the inner 3; braadly campanulate. Stamens 6; filaments short, connate in a ring of the perigone. Styles short; stigma 3-lobed; ovary inferior, conical, 3-celled. Capsules elliptic.

Common in forests, specially in shaded rocky places.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 2957 Mawsmai Cave (Khasi Hills).



Taccaceae

Dumortier, Anal. Fam. Pl. 57. 1829.

Perennial herbs. Rootstock, creeping, fleshy with scars of fallen leaves at intervals. Leaves simple, broad, lanceolate, entire or lobed. Scapes leafless. Flowers umbellate at the apex of scapes, greenish brown or pale violet, subtended by leafy spathes forming an involucre, bracts long, filiform or pedicel-like. Perianth 6, in 2 series. Stamens 6, in 2-series; filaments short, dilated at base, anthers introrse. Carpels 3; stigmas expanded in an inferior 1-celled ovary; ovules numerous; placentation parietal. Fruit a capsule or a berry. Seeds numerous, flat. Embryo with copious endosperms.

Tacca Forst.

Characters of the family.

K E Y T O S P E C I E S

1a. Scapes much longer than the leaves; involucral spathes unequal, inner 2 with short flat stalks. . . . . cristata

1b. Scapes shorter than leaves; involucral bracts subequal, all sessile . . . . . laevis

Tacca cristata Forst. Pl. & Sculent. No 28. 1786; Hook.f. Fl. Brit. India 6: 287. 1892.

Rootstock stout, recurved. Leaves 20-40 cm long, oblong-lanceolate, thin in texture, green above and brown purple beneath, many-nerved, nerves alternate, base unequal sided, apex acute. Petiole stout, 1 cm across, channelled, sheathing at base, longer than blades. Scapes slender, up to 1 m high, much longer than leaves. Involucral spathes 4, 2 outer ovate, cuneate, 10 x 5 cm acute, sessile, 13-nerved with many cross nervules; inner 2 broader than the outer ones, oblique, with short stalk. Bracts numerous, filiform. Inflorescence umbellate. Flowers peduncled. Pedicels filiform; flowers bisexual, 1-2 cm across. Perianth 6, inner 3 larger, 1 cm across; outer cuneate, 8 mm across; stamens 6, filaments very short; anthers adnate to the base of the perianth lobes, included. Styles short, included, 3-lobed; stigmatic lobes ciliate. Capsules cuneate or oblong.

Rare; collected only once at Mawmluh in deep forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1215 Mawmluh.(Khasi Hills).

Tacca laevis Roxb. Fl. Ind. 2: 171. 1832; Hook.f. Fl. Brit. India 6: 288. 1892; Rao & Verma in Bull. bot. Surv. India 15(3-4): 191. 1973 (Plate 96).

Rootstock prostrate, thick and fleshy. Scapes short, cylindric, greenish-brown. Leaves long-petioled; petioles as long as or longer than blades; blades elliptic or ovate-lanceolate, 30-40

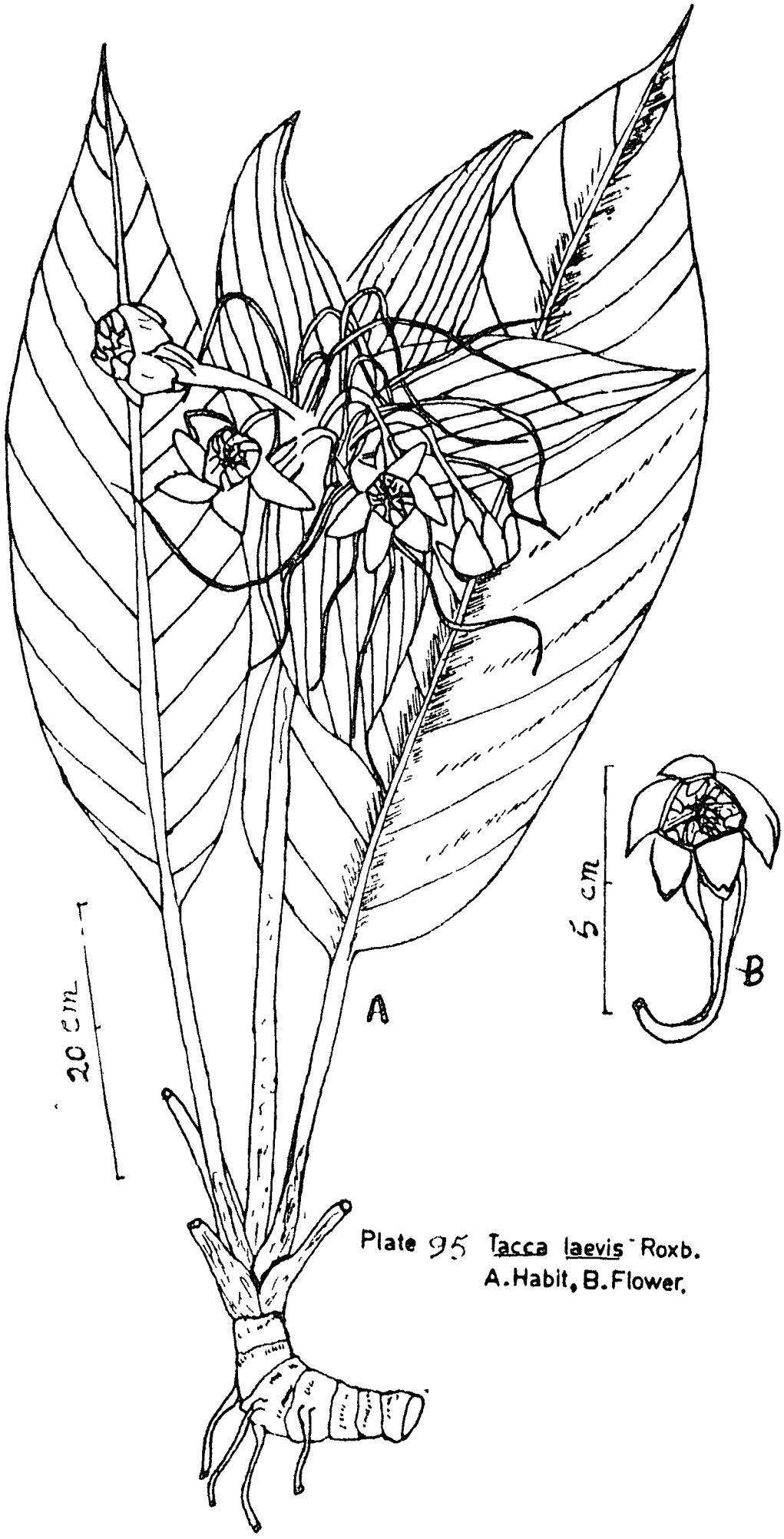


Plate 95 Tacca laevis Roxb.
A. Habit, B. Flower.

x 10-20 cm, acute or acuminate, entire. Inflorescence capitate. Bracts filiform, long, fleshy. Perianth 6, in 2-series, leafy, subequal. Stamens 6; filaments short; anthers introrse, brown-violet. Carpels glandular, surrounded by a distinct rhomboid, cup-shaped, perigynous hood. Fruit a berry or a 3 valved capsule, elliptic, angular; seeds numerous.

Common in shady areas in deep forests, constituting ground flora.

Fls. & Frts. : October to Febr ..

Specimens examined: Myrthong 2933 Tura Peak (Garo Hills).

Stemonaceae

Franch. and Savat. 1879.

Rhizomes tuberous or creeping. Stems erect or twining, branched. Leaves opposite or alternate with close parallel nerves. Flowers axillary, pedunculate, regular, bisexual, solitary or in racemes. Perianth 4, in 2-series, free or rarely connate at base, imbricate. Stamens 4, free or adnate to the perianth segments; anthers basifixed or dorsifixed; ovary superior or semiinferior, 1-celled; ovules 2 or more, erect or pendulous from the top of the cells, or free central or basal placentas. Stigma 3, subsessile. Fruit a 2-valved capsule. Seeds oblong.

Stemona Lour.

Stemona tuberosa Lour. Fl. Coch. 490. 1790; Hook.f. Fl. Brit. India 6: 298. 1892 (Plate 97).

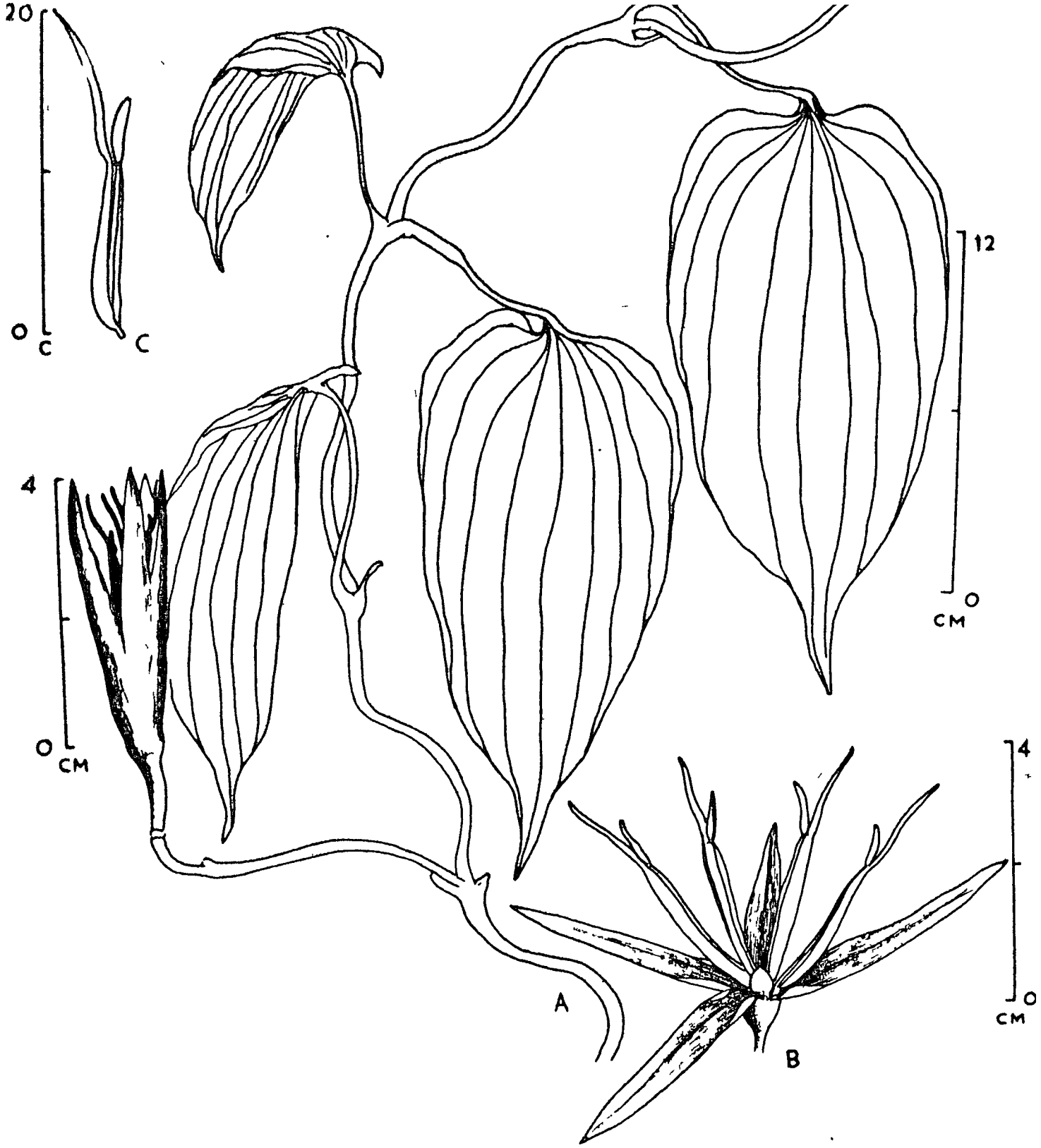


Plate 96 Stemona tuberosa Lour. A. A portion of the stem, B. Flower open out, C. Stamen.

Climbing plants with tuberous rhizomes. Stems herbaceous, branched, glabrous. Leaves opposite, ovate, acuminate, 10-15 x 8 cm, distinctly 9-nerved, convergent, base rounded; petioles 3-5 cm long, slightly sheathing at base. Flowers bracteate, bracts 1.5 x 0.5 cm, scarious. Perianth 4, in 2-series, greenish, with 9-11-nerved, purplish; outer segments linear-lanceolate, narrowed gradually towards the tip, 4-5 x 0.8 cm, inner segments cuneate, 4-4.5 x 1 cm; peduncles as long as the petioles or slightly longer. Stamens 4, filaments stout, red, deeply grooved in front with crenulate margins; connective linear-lanceolate, acuminate, green anthers linear, adnate to the face of the connective at its base; endothecium becoming free and produced beyond the cells into a subulate point. Carpels 2; stigma small, pointed; ovules 2, erect. Capsules oblong, grooved, beaked. Seeds ovoid or oblong, terete, grooved.

Rare; noted only in deep forests; usually mistaken for a species of Dioscorea when in vegetative condition.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 3121 Tura foot hill (Garo Hills); 2959 Nongpoh (Khasi Hills).

Smilacaceae

Vent. Tabl. Regne Veg. 2: 146. 1799.

Woody or herbaceous lianas. Stems branched, armed. Leaves simple, alternate; petioles sheathing on the lower part with wing-like margin, jointed at the apex of petiole-sheath or at the base of the blades. Inflorescence axillary, umbels or terminal,

spicate. Flowers dioecious; perianth 6, in 2-series, connate or free; inner segments narrower than the outer ones. Stamens 6, sometimes more, free or monadelphous; filaments free, long or short; anthers 1-celled; in female flowers stamens reduced to staminodes; ovary superior, 2-3-celled with 1-2-ovuled in each cell; stigmas 3. Fruit a loculicidal capsule or rarely a berry.

K E Y T O S P E C I E S

1a. Leaves cordate at base; perianth connate forming a tube or bottle-shaped structure; stamens 3 or 6. . . Heterosmilax

1b. Leaves not cordate at base; perianth free or rarely connate at base; stamens 6. . . . . Smilax

Heterosmilax Kunth

Heterosmilax indica DC. Monogr. Phan. 1: 43. 1878; Hook.f. Fl. Brit. India 6: 314. 1892; Koyama in Fl. Taiw. 5: 135. 1979.

Slender climbers, 3-5 m long. Stems and branches subterete, unarmed, shining. Leaves 8-15 x 3-6 cm, oblong-lanceolate or lanceolate, apex acute, base rounded or subcuneate, 5-7-nerved; median nerves prominent, raised above on the lower face, leaves glaucous when young, deep green. Petioles 2-3 cm long, subcompressed, sheaths winged, 4-5 mm wide; tendrils coiled, very slender, 10-20 cm long. Inflorescence axillary; peduncles 2-5 cm long. Rays 1-1.5 cm long, unequal; umbels many-flowered. Staminate perianth fusiform, 4-5 mm long, gradually tapering towards the

base, apex 3-toothed. Stamens 3; filaments connate, 3 mm long; anthers longer than filaments; ovate, subacute. Pistillate perianth subelliptic or subglobse, clavate. Berries globose, black, changing to scarlet. Seeds 1-3, ovoid, 3-4 mm across, covered with a papery membrane.

Common, in deep and shrubby forests along the banks of streams, rivers, etc.

Fls. & Frts. : February to December.

Specimens examined: Myrthong 1319 Shillong Peak; 1166 Laban forest. (Khasi Hills); 1477 Garumpani (Jaintia Hills).

Smilax Linn.

Woody or herbaceous lianas, sometimes shrubs; stems and branches often armed with prickles or bristles. Leaves alternate, lanceolate to ovate, 3-7-nerved, with reticulate veinlets; petioles sheathing on the lower part with a pair of wings, jointed either at apex or between the apex and the sheathing portion, or sometimes at the apex of the sheath; tendrils arising from immediately above the petiole sheath. Inflorescences of either single umbel at non-prophyllate axils of leaves or of 1-many-umbellate racemes or spikes. Flowers dioecious, perianth segments 6, free or connate. Staminate flowers with 6, rarely 9-18, free or rarely monadelphous stamens; anthers unilocular, almost basifixed; vestigial pistil none. Pistillate flowers with 1 pistil and 3-6 staminodes; ovary ovoid or globose; styles very short; stigmas 3, usually recurved. Fruit a berry.

K E Y T O S P E C I E S

1a. Wings of petiolar sheaths well developed, clasping round the stem .

.2a. Inflorescence with 1-3-umbels in a raceme . . . ocreata

2b. Inflorescence with 7-15-umbels in a raceme . . . perfoliata

1b. Wings of petiolar sheaths poorly developed.

3a. Branches and branchlets sharply angled.

4a. Stems erect, branches unarmed, not zigzag; leaves ovate, acuminate; inflorescence terminal, few-flowered. . . . . myrtillus

4b. Stems climbing, branches armed, zigzig; flowers in exillary umbels. . . . . quadrata

3b. Branches and branchlets terete or nearly so.

5a. Stems and branches verruculose. . . . . bracteata var. verruculosa

5b. Stems and branches not verruculose.

6a. Stems tufted, erect or suberect; leaves oval or hemispherical. . . . ferox

6b. Stems not as above; leaves lanceolate or deltoid.

7a. Stems and branches armed rarely unarmed; leaves lanceolate; inflorescence 1-umbellate, rarely 2-umbellate . lanceifolia

7b. Stems slender, rarely armed; leaves deltoid or oblong; inflorescence umbellate or spicate.

8a. Inflorescence @ long, axillary or terminal, spicate of many sessile umbels. . . . . aspera

8b. Inflorescence a short, axillary solitary, peuncled umbel . . . . glaucophylla

Smilax aspera Linn. Sp. Pl. 1: 1028. 1753; Hook.f. Fl. Britt India 6: 306. 1892; Koyama in Hara, Fl. East. Himal. 414. 1966 . (Plate 98 C).

Vern.- ' Sohkrot ' (K).

Slender climbers, 5-8 m high, stems poorly armed, striate. Leaves deltoid, 5-10 x 3-6 cm, acutely tapering from the truncate or subrounded base towards the apex, 5-7-nerved, deep green, blotched with white nerves, submarginal nerves undulated, sometimes midnerves prickly towards the base. Petioles 2-3 cm long, prickly, subcompressed, sheathing to less than half the petioles, wings narrow with slender tendrils on their side. Inflorescence a long axillary pendulous spike with umbels; umbels sessile, alternate on the pendulous axis; rays slender shorter than the bud. Male flowers 5 mm long, dense, on the globose receptacle. Perianth 6, as long as the flower, in 2-series, linear obtuse, brown. Stamens 6; filaments 1 mm long; anthers less than a milimeter, white; pistillate flowers same as males with smaller perianth; stigmas curved. Ovary 3-celled. Berries 3-seeded, globose.

Common in secondary forests, profusely climbing on trees.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1200 Shillong.

Q 578

Smilax bracteata var. verrucolosa (Merr.) Koyama in Hara Fl. East. Himal. 415. 1966 et in Fl. Taiw. 2: 113. 1979. - - S. verruculosa Merr. in Philip. Journ. Sci. 5: 173. 1910. - - S. bracteata Presl. var. verruculosa (Merr.) Koyama in Quart. Journ. Taiw. Mus. 10: 18. 1957.

Vern.- ' Sohkrot ' (K).

Tall climbing plants. Stems subterete, or obtusely 3-4-angled, warted all over, and sparsely armed. Leaves linear-lanceolate, 10-15 x 3-5 cm, base subcuneate, apex cuneate or abruptly pointed into the caudate apex, 3-5-nerved, with irregular nervations in between the main nerves. Petioles 1-1.5 cm long, clavate, above, sheathing below to about half the petioles; wing narrow, tendrils indistinct or poorly developed. Inflorescences borne at prophyllate axils of the lower parts of branches, 5-10 cm long, 2-3 umbelled, peduncles stout, 2-3 cm long. Staminate flowers: perianth 6, in 2-series, 4-5 mm long, recurved at anthesis, outer ones longer than the inner ones. Pistillate flowers same as in males but with smaller and shorter perianth. Ovary ellipsoid, 1.5 mm long; stigmas 1 mm long. Berries globose, 5 mm across; staminodes filiform.

Rare; occurs in scrub jungles in warmer regions of Meghalaya.

Fls. & Frts. : December to June.

Specimens examined: Myrthong 1545 Lailad (Khasi Hills).

Smilax ferox Wall. ex Kunth Enum. Pl. 5: 251. 1850; Hook.f. Fl. Brit. India 6: 307. 1892; Koyama in Hara Fl. East. Himal. 415. 1966.

Vern.- ' Sohkrotshrah ' (K).

Tufted shrubs. Stems and branches strongly armed, terete; branchlets glabrous, angular. Leaves variable, 2-10 x 2-6 cm, ovate or elliptic, narrowed at both ends, 5-7-costate excluding the obscure marginal nerves, venations suberect towards the apex. Petioles short 1-4 cm long, sheathing to more than half , jointed near the base of the blade, wing membranous, 3 mm across, tendrils vestigial in flowering branches; abaxial angle ovate or cuneate, recurved. Inflorescence axillary, peduncle 1-5 cm long, umbels few-flowered; rays 0.5-1 cm long. Staminate perianth 6, 2-3 mm long, stamens 6, shorter than perianth segments. Pistillate perianth same as that of the staminate ones, styles stout, short; staminodes 3. Ovary 2-celled. Berries 1-2-seeded, globose, green turning scarlet at maturity.

Common in shrubby areas along the banks of streams, water channels, etc.

Fls. & Frts. : January to June.

Specimens examined: Myrthong 1655 Laikor; 1321 Shillong; 1812 Pariong (Khasi Hills); 1582 Jowai (Jaintia Hills).

Smilax glaucophylla Kotz. in Reise Prinz. Wald. Bot. 45, t. 91. 1862; Koyama in Hara Fl. East. Himal. 415. 1966. - - Smilax parvifolia Wall. ex Hook.f. Fl. Brit. India 6: 304. 1892.

Vern.-' Sohkrot ' (K).

Stems and branches unarmed, shining, sometimes the young shoots glaucous. Branchlets slightly zigzag. Leaves very variable, 5-10 x 2-4 cm, obcuneate, or lanceolate, base rounded, apex acute, 7-nerved, including the marginal nerves, nervules numerous, median costae subequally united just above the base. Petioles 1-2.5 cm long, subcompressed, sheathing up to half, wings 2 mm across tendrils reflexed; in the branchlets vestigial. Inflorescence axillary, peduncles 1-2 cm long, developing directly from the stems, 0.5-1 mm away from the axil. Umbels many-flowered; rays 0.5-1 cm long, filiform, bracteoles minute, numerous. Staminate perianth 1-2 mm long, greenish-brown. Stamens as long as or shorter than the perianth segments. Pistillate perianth larger than the staminate ones; styles sessile, stigmas subglobose; ovary ovoid, 1-3-celled. Berries globose, 3-6 mm across. Seeds 1-3.

Common in forests.

Fls. & Frts. : March to November.

Specimens examined: Myrthong 1831 Markasa (Khasi Hills).

Smilax lanceifolia Roxb. Fl. Ind. 2, 3: 792. 1832; Hook.f. Fl. Brit. India 6: 308. 1892; Majumdar in Rec. bot. Surv. India 20(2): 225. 1973; Koyama in Fl. Taiw. 5: 114. 1979.

Vern.-' Sohkrot ' (K).

Stems terete, densely or sparsely armed. Flowering branches 30-50 cm long. Leaves lanceolate, or elliptic, 5-15 x 2-8 cm, narrowed into an abrupt, caudate apex, base acute or subcuneate. Costae 5, united at base, venations reticulate, suberect towards the apex. Petioles 1-2 cm long, wings less than half the length

of petiole; abaxial angle very small 5 mm long. Umbels 1-4 cm across. Peduncles 1 cm long; rays 1-1.5 cm long. Staminate perianth 4-5 mm long, brown or greenish-brown; filaments as long as or shorter than perianth; anthers very small. Pistillate perianth similar to that of males, perianth 1-2 mm long; stigmas short; ovary 3-celled. Fruit a 3-seeded berry.

Common in all types of forests.

Fls. & Frts. : December to July.

Specimens examined: Myrthong 1316, 1317, 1318 Shillong; 1199 Upper Shillong (Khasi Hills).

Smilax myrtillus DC. Monogr. Phan. 1: 106. 1878; Hook.f. Fl. Brit. India 6: 304. 1892;

Erect or suberect shrubs, 1-1.5 m high, branched above, stems slender terete, jointed with scales or dry sheaths at the nodes. Branchlets sharply 4-angled. Leaves very small, alternate on nodes, 1-4 x 1-2 cm, elliptic, ovate-lanceolate, 3-costate, excluding the obscure marginal nerves. Petioles 1-4 mm long, sheathing near the angle, not winged, without tendrils. Inflorescence a terminal umbel of few-flowered, sometimes 2-flowered only at the axil of 2 terminal leaves; peduncles slender 0.8-1 cm long. Staminate perianth 8 mm long, subequal. Stamens 2-3 mm long; pistillate perianth similar to that of staminates; ovary conical, styles stout. Berries 2-seeded or sometimes 3, seeds scarlet, globose, 4 mm across.

Common in forests forming shrub layer, specially on slopy and rocky places.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1357 Shillong.

Smilax ocreata DC. Monogr. Phan. 1: 193. 1878; Koyama in Hara Fl. East. Himal. 416. 1966.

Vern.-' Sohkrot ' (K).

Climbers. Stems 6 m high, terete or obtusely angled, shining, sparsely armed. Leaves 15-25 x 5-10 cm, obcuneate, apex acute, turning brown when dry; base subacute. Costae 5, median 3 united above the base, convergent. Petioles 2-3.5 cm long, jointed above the sheath and below the base of the blade, turning black when dry, sheathing to the base, wing broad, auricle stem clasping. Tendrils slender on the sides of the petiole. Umbels axillary; peduncles developing at the adaxial face of the angle, common peduncle stout, 1-1.5 cm long, angled, heads cuneate, few-flowered; stigma long, curved, staminodia 1-3, filiform. Berries 1 cm across, shining, 1-seeded. Seeds fleshy, 5 mm across.

Common in dense forests, twining on other plants.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 1314 Shillong.

Plate 97 A. Smilax perfoliata Lour, B. portion of the fruiting twig, C. S.aspera Linn. D. Flowering twig, E. Flower (top view).

Smilax perfoliata Lour. Fl. Coch. 622. 1790; Koyama in Quart. Journ. Taiwan Mus. 10: 16. 1957, et in Fl. Taiw. 5: 155. 1979)(Plate 98 A).

Stems terete or angular, up to 10 m high, armed with stout, short prickles. Leaves broad, ovate-lanceolate, 15-20 x 8-15 cm, 5-7-nerved, median 3 nerves united above the base, convergent, raised on the lower surface; marginal nerves zigzag, obscure; base truncate or subcordate; apex acute to acuminate. Petioles 2-4 cm long, jointed above the base, sheathing. Abaxial angle ovate, wing highly developed, clasping round the stem, with 2-4 tendrils at the notch or on the side. Umbels axillary; peduncle shorter than petioles; staminate perianth 5 mm long, strongly recurved at anthesis, outer segments longer than the inner ones; stamens 6, filaments filiform, 5 mm long, anthers minute, less than half a milimeter, yellow or white. Pistillate flowers similar to that of males; stigma minute, with 3 filiform staminodes. Berries 1-2-seeded.

Common on shruos, in forest. Frequent in pine forests.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1551 Lailad, 1520 Tynring (Khasi hills); 3124 Tura Peak (Garo Hills).

Smilax quadrata DC.Monogr. Phan. 1: 183. 1878; Hook.f. Fl. Brit. India 6: 308. 1892.

Straggling climbers. Stems 5-8 m long, sharply 4-angled. Branches zigzag, internodes 6-8 cm long, armed with short, erect prickles. Leaves ovate-lanceolate, 5-10 x 4-6 cm, base rounded,

acute to acuminate. Petioles 2-4 cm long, jointed above the base, sheathing. Abaxial angle ovate, wing highly developed clasping round the stem, with 2-4 tendrils at the notch or on the side. Umbels axillary; peduncle shorter than petioles; staminate perianth 5 mm long, strongly recurved at anthesis, outer segments longer than the inner ones; stamens 6, filaments filiform, 5 mm long; anthers minute, less than half a milimeter, yellow or white. Pistillate flowers similar to that of males; stigma minute, with 3-filiform staminodes. Berries 1-2-seeded.

Common on shrubs, in forest. Frequent in pine forests.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1551 Lailad; 1520 Tynring (Khasi Hills); 3124 Tura Peak (Garo Hills).

Dioscoreaceae

R. Br. Prodr. 294. 1810.

Climbing herbs with tuberous rhizomes. Leaves alternate or opposite, simple or compound with reticulate venation. Flowers usually unisexual, epigynous, regular, in spikes, racemes or panicles. Bracts small, sometimes obsolete. Perianth 6, united in campanulate or rotate perigone with a short tube. Male flowers: stamens 3-6, all fertile or 3 reduced to staminodes; filaments incurved or recurved; anthers 2-celled, globose or didymous, pistillode various or absent. Female flowers: perianth same as in males; styles 3, very short; stigma entire or 2-fid. Ovary inferior, 3-quetrous, 3-celled. Ovules 2 in each cell. Fruit a berry or a 3-winged capsule. Seeds compressed or winged.

Dioscorea Linn.

Characters of the family.

K E Y T O S P E C I E S

1a. Leaves compound.

2a. Middle leaflets 3-costate; stamens 6, all fertile; capsules 4-6 cm long . . ... hispida

2b. Middle-leaflets 1-costate; stamens 3 fertile; capsules 1-3 cm long.

3a. Stems unarmed; glabrous or sparsely red-hairy; bulbils absent; leaves 3-floliate; male flowering axes developing on leafless branches . . . . . arachidna

3b. Stems sometimes prickly, glabrous to villous; bulbils usually present; leaves 3-7-foliate; male flowering axes axillary or on leafless branches.

4a. Stems usually prickly; leaflets broadly oblanceolate or obovate; capsule apex truncate . . . . . pentaphylla

4b. Stems unarmed; leaflets ovate-lanceolate, sometimes obovate; capsule apex obtuse . .

5a. Stems villous when young; bulbils few or sometimes absent, hairy; leaflets ovate-elliptic, the middle one up to 10 x 6 cm . . . . . kamoonensis

5b. Stems glabrous; bulbils numerous, in almost every leaf-axil; leaflets lanceolate, glabrescent, the middle one up to 12 x 2 cm . . . . . melanophylla

1b. Leaves simple.

6a. Stems twining to the left.

7a. Stems prickly, puberulous to villous . . esculenta

7b. Stems unarmed, glabrous.

8a. Bulbils abundant; leaves commonly 20 x 20 cm, tips glandular; seeds winged at the base only . . . . . bulbifera

8b. Bulbils rare; leaves usually smaller than above, tips eglandular; seeds winged all around . . . . . deltoidea

6b. Stems twining to the right.

9a. Plants hairy, particularly on the petioles and inflorescence.

10a. Leaves commonly 15 x 5 cm, lanceolate, obtuse or rounded at base, 5-costate . . . . trivervia

10b. Leaves commonly 12-x 10 cm, ovate, cordate at base, 7-9-costate . . . . . puber

9b. Plants glabrous.

11a. Stems 4-angled, prominently winged . . alata

11b. Stems terete, or faintly winged.

12a. Male flowering axis zigzag . . . . hamiltonii

12b. Male flowering axis straight.

13a. Male flowers 2 mm apart . . . wallichii

13b. Male flowers congested, touching each other.

14a. Stems prickly at the base; bulbils ~~not produced~~ . . . . . glabra

14b. Stems unarmed; bulbils produced in abundance . . . . belophylla

Dioscorea alata Linn. Sp. Pl. 1033. 1753; Hook.f. Fl. Brit. India 6: 296. 1892; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 201. 1973.

Tubers solitary, polymorphic. Stems 4-angled or winged, unarmed or prickly, bulbils numerous. Leaves opposite or sometimes

alternate, ovate, hastate with rounded, acute lobes, 15 x 15 cm, 5-costate; petioles 5-10 cm long. Male flowering axis developing on leafless branches, solitary or paired; bracts ovate, 1 mm long; perianth lobes as long as bracts. Stamens 6. Female flowering axis solitary, faintly winged; bracts ovate, 2 mm long; perianth lobes as long as bracts. Capsules 1.5 cm long, apex retuse. Seeds winged all around.

Cultivated for the edible tubers.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1155 Shillong

Dioscorea arachidna Prain et Burk. in Journ. Asiat. Soc. Beng. N. S. 10: 21. 1914; Rao & Verma in Bull. bot. Surv. India 14(1-4): 193. 1972.

Vern.-'Sohkyrsiew' (K).

Tubers oblong, long stalks, fleshy white. Stems obscurely ridged, glabrous or sometimes red hairy. Leaves alternate, 3-foliate, middle leaflets elliptic to obovate, 10 x 5 cm, mucronate, glabrous or pubescent along nerves beneath, petioles up to 3 cm long, petiolules 4-5 mm long. Male flowering axis axillary, leafless, usually solitary or with short branch, hairy, with congested flowers; bracts orbicular, 1.2 mm long; perianth lobes shorter than the bracts. Stamens 3, Female flowering axis slender many-flowered; bracts and perianth lobes similar to that of males.

Capsules ascending, overlapping in the lower portion, apex obtuse. Seeds winged at base.

Common in secondary forests, climbing on small trees or shrubs.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 2989 Shillong.

Dioscorea belophylla (Prain) Haines For. Fl. Chota Nagpur 530. 1910; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 199. 1973; Babu Herb. Fl. Dehra Dun 514. 1977.

Stems terete or obscurely ridged, purplish-brown. Leaves alternate or opposite above, ovate, cordate at base, 15 x 12 cm, or more, 9-costate. Male flowering axes developing on leafless branches, many-flowered; bracts ovate, 0.5 mm long; perianth lobes 1 mm long, dotted. Stamens 6. Female flowering axes solitary, many-flowered; bracts deltoid; tepals 1 mm long, suborbicular. Capsules 1.6 cm long, apex retuse. Seeds winged all around.

Ocassional, in secondary forests.

Fls. & Frts. : January to March.

Specimens examined: Myrthong 2995 Shillong peak.

Dioscorea bulbifera Linn. Sp. Pl. 1033. 1753; Hara Fl. East. Himal. 419. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 201. 1973; Babu Herb. Fl. Dehra Dun 515. 1977. - - D. sativa Thunb.

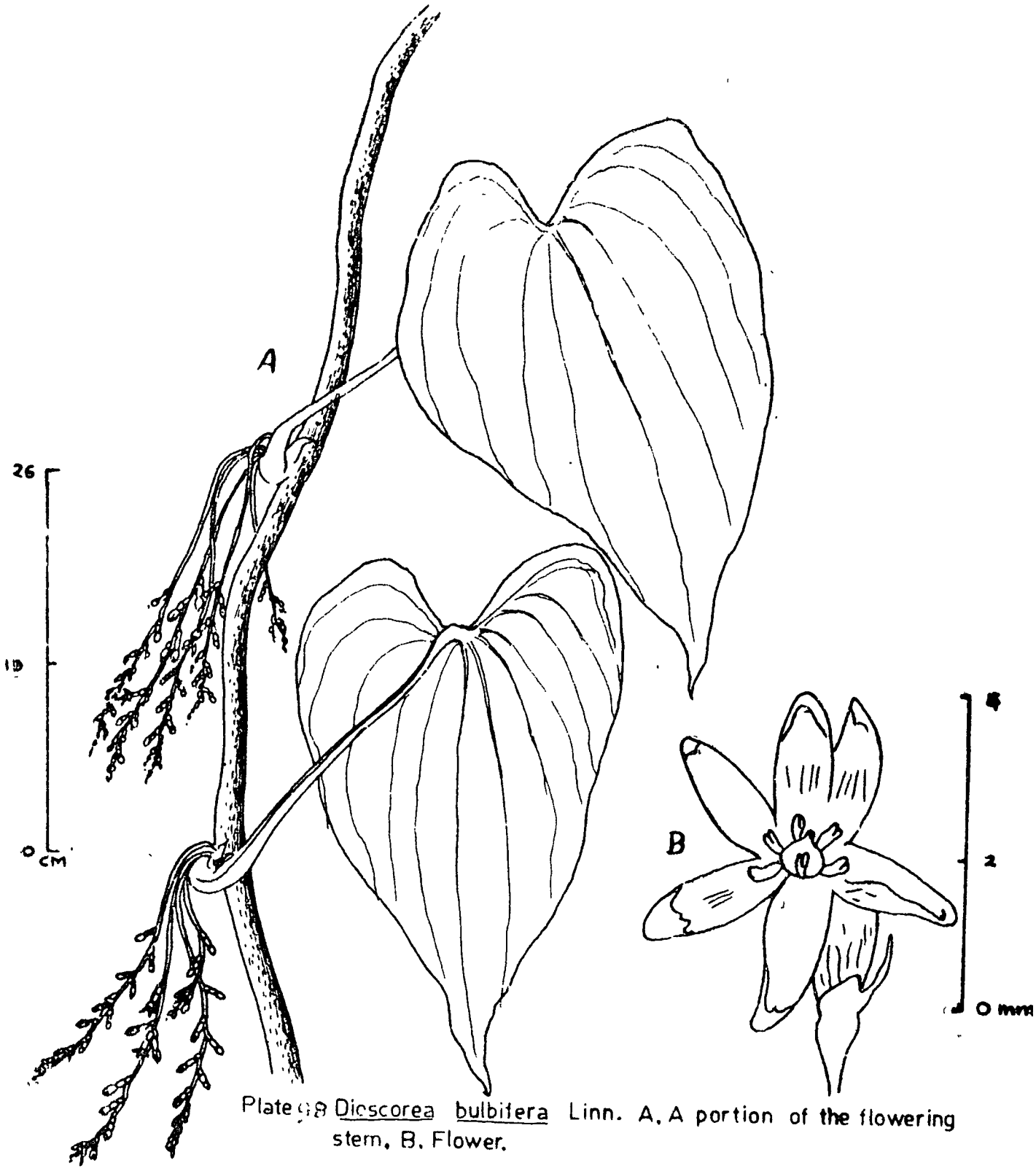


Plate 38 Dioscorea bulbifera Linn. A, A portion of the flowering stem, B, Flower.

Fl. Jap. 151. 1784; Hook.f. Fl. Brit. India 6: 295. 1892 (Plate 99).

Stems glabrous, twining to the left. Leaves cordate, apex subcaudately acuminate. 10-30 x 8-25 cm, 5-7-costate; petioles 5-12 cm long. Male flowering axes axillary, long, pendulous; bracts 1.5 mm long, tepals 2-4 mm long, lanceolate; stamens 6. Female flowering axes axillary; bracts ovate, as long as that of males; tepals smaller than that of males. Capsules bright chestnut, congested, wings rounded at both ends.

Common in forests.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1889 Mawmluh; 1887 Mawsmai; 1946 Burnihat (Khasi Hills); 1948 Sohkha (Jaintia Hills); 1963 Baghmara (Garo Hills).

Dioscorea deltoidea Wall. ex Hook.f. Fl. Brit. India 6: 291. 1892; Ohashi in Hara Fl. East. Himal. 419. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 196. 1973.

Rhizomes long, creeping. Stems sulcate. Leaves alternate, ovate-cordate, 5-8 x 5-6 cm, hispid, 7-costate; petioles 5-15 cm long. Male flowering axes solitary, flexuous, branched, many-flowered; bracts minute, 1 mm long; tepals 1.2 mm long; stamens 6. Female flowering axes axillary, Capsules reflexed, reddish, stramineus in age.

Common both in deep and shrubby forests.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 3183 Kyrdemkulai (Khasi Hills).

Dioscorea esculenta (Lour.) Burk. in Gard. Bull. Str. Settl. 1: 396. 1917; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 196. 1973. - - Oncus esculentus Lour. Fl. Cochinch. 194. 1790.- - Dioscorea sativa Linn. Sp. Pl. 1033. 1753; non Hook.f. Fl. Brit. India 6: 295. 1892.

Tubers many, cylindric or lobed. Stems prickly at base, Leaves alternate, ovate, base cordate, apex caudately acuminate, 10-20 x 10-20 cm, 9-13-costate, hairy beneath; petioles hairy, or prickly. Male flowering axes solitary, hairy, up to 20 cm long, bracts 2-2.5 mm long, tepals up to 2 mm, many-flowered; stamens 6. Female flowering axes also solitary, hairy, many-flowered; bracts 2 mm long; tepals 3 mm long, hairy. Capsules reflexed.

Cultivated for their edible tubers.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 2984 Shillong.

Dioscorea glabra Roxb. Fl. Ind. 3: 803. 1832; Hook.f. Fl. Brit. India 6: 294. 1892; Ohashi in Hara Fl. East. Himal. 419. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 199. 1973; Babu Herb. Fl. Dehra 515. 1977.

Tuber solitary or fascicled, cylindric, fleshy white. Stems terete or obscurely ridged. Leaves elliptic, 6-10 x 5-6 cm, 7-costate, base rounded or subcordate, apex acuminate. Male flowering axes very long, sometimes up to 1 m long on leafless branches, sometimes axillary; 15-30-flowered, bracts minute, tepals ovate, as long as bracts; stamens 6. Female flowering axes solitary or paired, shorter than males, flowers up to 50; bracts 1 mm long, tepals equalling the bracts, ovate. Capsules retuse, wings 1.5-2 x 2 cm.

Common in secondary forests. Tubers edible.

Fls. & Frts. September to January.

Specimens examined: Myrthong 3253 Umsning (Khasi Hills).

Dioscorea hamiltoni Hook.f. Fl. Brit. India 6: 295. 1892; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 200. 1973.

Tubers slender, stalked, laterally spreading, fleshy white. Stems ridged. Leaves alternate or opposite in the upper portions, lanceolate, acuminate, 10-20 x 5-10 cm, 7-costate; petioles 5-10 cm long. Male flowering axes on 10-50 cm long, leafless branches simple or branched, axes 6-20-flowered; bracts brown dotted; tepals orbicular, about 1 mm long; stamens 6. Female flowering axes solitary or many together, angled, 20-30-flowered; bracts and tepals subequal, 1.5-2 mm long. Capsules brown; apex retuse;

seeds winged all around.

Frequent in deep forests.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 3225 Nongpoh (Khasi Hills).

Dioscorea hispida Dennst. Schluess. Hort. Malab. 15. 1818; Hara Fl. East. Himal. 420. 1966; Babu Herb. Fl. Dehra Dun 515. 1977. - - Dioscorea daemona Roxb. Fl. Ind. 3: 805. 1832; Hook.f. Fl. Brit. India 6: 289. 1892.

Vern.- ' Sohkyrsiew ' (K).

Stems climbing, twining to left . Leaves compound 3-5-foliate, pubescent, leaflets ovate, acute, apex broadly cuneate, base cuneate or oblique. Bulbils at the axils of leaves. Male flowers in paniculate spikes, dense, oblong, cylindric, 2-3-nate, pubescent, pendulous; perianth 6, outer segments orbicular, glabrous or hairy without; inner segments ovate, glabrous, larger than the outer ones; stamens 6, 3 only fertile; filaments short; anthers large, 2 mm long. Female flowers: simple, solitary; stigma 3-lobed; ovary 3-celled. Capsules reflexed, rounded at the apex, 3-4 x 2-3 cm. Seeds winged, at base.

Common in open secondary forests as well as in deep forests, climbing on branches of small trees.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 2934 Mawphlang (Khasi Hills).

Dioscorea kamoonensis Kuntn Enum. Pl. 5: 395. 1850; Hook.f. Fl. Brit. India 6: 290, 1892; Ohashi in Hara Fl. East. Himal. 420. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 194. 1973.

Tubers subglobose. Stems hairy, Leaves alternate 3-5-foliate, hairy; petioles 5-15 cm long, pubescent, petiolules 1-2 mm long; middle leaflets ovate-lanceolate, 8-12 x 2-5 cm, hispidulous above and hairy beneath, outer leaflets shorter than the middle ones, 2-3-nerved. Male flowering axes axillary or on leafless branches, 2-6 together; bracts 4 mm long, hairy; tepals very small, 1 mm long. Female-flowering axes 1-3-together, pubescent, 20-25 cm long, pendulous; bracts 3-4 mm long; tepals minute. Capsules congested, wings 2-2.5 x 0.5-0.8 cm; seeds winged at base only.

Common in secondary forests,

Fls. & Frts. : October to January.

Specimens examined: Myrthong 2941 Karumpani (Jaintia Hills).

Dioscorea melanophyma Prain et Burk. in Journ. Asiat. Soc. Beng. N. S. 4: 452, 1908; Ohashi in Hara Fl. East. Himal. 420. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 196. 1973.

Tubers ovoid, fleshy. Stems hairy. Leaves alternate, 3-7-foliate; petioles 5 cm long; petiolules 1-6 mm long; middle leaflets 5-10 x 1-2 cm, subcaudately acuminate. Male flowering axes solitary, or 2-3 together, axillary; bracts and tepals 1 mm long, pubescent; stamens 6. Female flowering axes pendulous, solitary or paired, hairy. Capsules ascending, congested; base rounded, apex truncate. Seeds winged at base only.

Common in forests creeping or straggling on small bushy plants.

Fls. & Frts. September to December.

Specimens examined: Myrthong 2985 Upper Shillong.

Dioscorea pentaphylla Linn. Sp. Pl. 1032. 1753; Hook.f. Fl. Brit. India 6: 289. 1892; Ohashi in Hara Fl. East. Himal. 420. 1966; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 193. 1973; Babu Herb. Fl. Dehra Dun 514. 1977.

Vern.- 'Sohkyrsiew' (K).

Stems twining to the left, very prickly. Leaves digitate, 3-5-foliate, leaflets 5-10 x 3-6 cm, base cuneate, apex acute, late-

ral leaflets oblique at base. Petiole 5-10 cm long, pubescent. Male flowers in dense pubescent, cylindric, oblong, pendant paniculate spikes. Perianth 6; outer pubescent, acute; inner segments pubescent at the back only. Stamens 6, all fertile. Female flowers: perianth same as males; styles 3, short 1 mm long; ovary pubescent, 3-celled. Capsules 3-winged; wing membranous, shining, 1.5 x 1.2 cm; Seeds flat, winged all round.

Common in scrub jungles. Climbing on other plants.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2935 Shillong.

Dioscorea puber Bl. Enum. Pl. Java 1: 21. 1827; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 199. 1973. - - D. anguinea Roxb. Fl. Ind. 3: 803. 1832; Hook.f. Fl. Brit. India 6: 293. 1892.

Stems twining to the left. Leaves ovate, cordate, acute, strongly 5-7-nerved, 6-12 x 5-8 cm, softly hairy beneath, base cordate, opposite; upper leaves cuneate or rounded. Petioles 4-6 cm long. Male flowers in dense paniculate spikes, up to 30 cm long; flowers 1 mm long, perianth 6; outer 3, calycine, orbicular, canine-like, with dense, erect hairs on the back; inner 3 corolline, equalling to outer ones; stamens 6, all fertile; filaments short; anthers globose; pistillode present. Female flowers: stigma 3-lobed. Ovary 3-celled. Capsules elongated, up to 3 cm long, 3-winged. Seeds orbicular, winged.

Common climbers on small shrubs and sometimes reaching to top of tall trees, in forests.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 2966 Garumpani (Jaintia Hills).

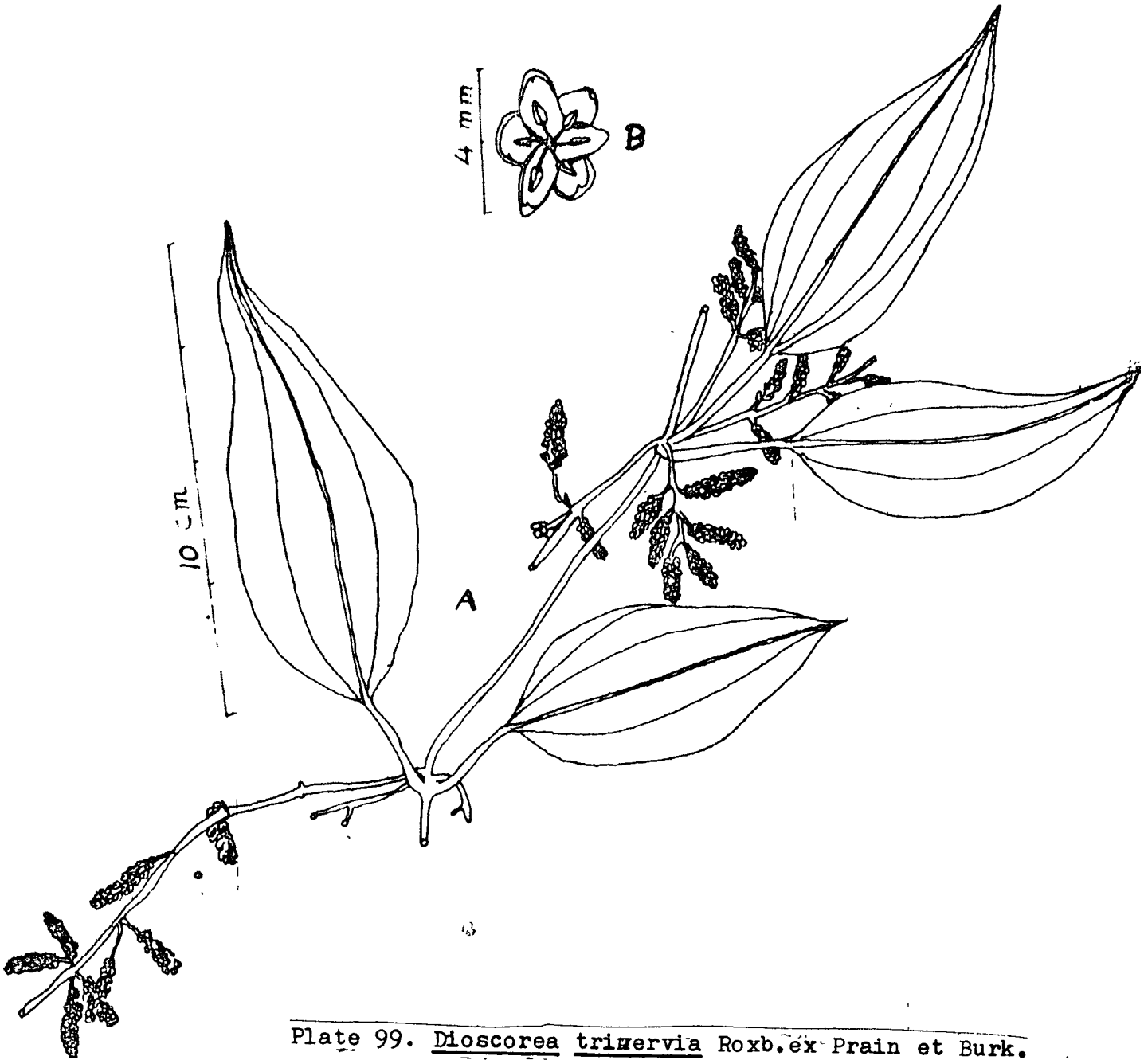


Plate 99. Dioscorea trinervia Roxb.ex Prain et Burk.

A. A portion of flowering twig, B. Flower (top view).

Dioscorea trinervia Roxb. ex Prain et Burk. in Journ. Asiat. Soc. Beng. N. S. 10: 32. 1914; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 197. 1973. - - D. oppositifolia Hook.f. Fl. Brit. India 6: 292. 1892 (Plate 100).

Stems twining to the right, glabrous. Leaves alternate or the upper leaves opposite, simple, lanceolate, 10-12 x 5-8 cm, acuminate, petioles 2-5 cm long. Male flowering axes up to 30 cm long; bracts 1 mm long; tepals 2 mm long. Stamens 6, all fertile. Female flowering axes shorter than the males; bracts 1 mm long, tepals shorter than the bracts; stigma 2-fid, hooked. Capsules 3-winged, apex truncate. Seeds winged all around.

Common in forests of lower elevations.

Fls. & Frts. : September to January.

Specimens examined: Myrthong 1494 Umroi (Khasi Hills).

Dioscorea wallichii Hook.f. Fl. Brit. India 6: 295. 1892; Rao & Verma in Bull. bot. Surv. India 15(3 & 4): 200. 1973.

Tubers fascicled. Stems stout, prickly at base. Leaves alternate or opposite, cordate at base, 20-25 x 20-25 cm, 7-9-costate. Male flowering axes 2-3-together, on leafless branches; bracts and tepals 1 mm long. Stamens 6. Female flowering axes slender, equalling the leaves. Capsules few, retuse or truncate at apex and base truncate. Seeds winged all around.

Common in secondary forests and fallows.

Fls. & Frts. October.

Specimens examined: Myrthong 2999 Kyrdemkulai (Khasi Hills).

ORCHIDALES

Burmanniaceae

Blume Enum. Pl. Jāva. 27. 1827.

Slender annual or perennial herbs, simple or sparingly branched. Leaves radical or reduced into scales or absent. Flowers bisexual, bracteate, regular, solitary or few on helicoid cymes. Perianth 6, in 2-series, superior, corolline, persistent; stamens 3 or 6; filaments very short, adnate to the perianth tube or throat; anthers 2-celled, included. Carpels 3; ovary inferior, 3-locular or 1-locular with axile placenta; ovules numerous. Fruit a capsule crowded by persistent perianth. Seeds minute.

Burmannia Linn.

Characters of the family.

K E Y T O S P E C I E S

1a. Saprophytic herbs; stems and leaves white. . . . . candilabrum

1b. Autotrophic herbs; stems and leaves green.

2a. Plants robust, 30-50 cm high; flowers on forked rachis. . . . . disticha

2b. Slender herbs, 6-15 cm high; flowers 1-3, at the apex of scape. . . . . coelestis

Burmannia candilabrum Gagnep. in Bull. Soc. Bot. Fr. 54: 462. 1907; Rao & Verma in Bull. bot. Surv. India 12(1-4): 143. 1970. - - B. candida Griff. ex Hook.f. Fl. Brit. India 5: 665. 1888.

Slender leafless herbs. Stems filiform, 4-10 cm high. Leaves radical, reduced to sheaths, cauline leaves reduced to scales. Flowers 1-5, purplish-blue; bracts about 2 mm long; perianth tube 3 mm long; perianth segments 6, in 2-series; outer lobes ovate, 2 mm long; inner ones linear-lanceolate, shorter than the outer ones. Stamens 3; filaments short, included, adnate to perianth-tube; style 1; stigma 3-lobed; ovary 3-locular with parietal or axile placentas; ovules numerous. Seeds numerous, minute, flat, elliptic.

Common in fallows, closely associated with grasses and other herbaceous plants.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1047 Shillong.

Burmannia coelestis D. Don Prodr. Fl. Nepal. 44. 1825; Hook. f. Fl. Brit. India 5: 665. 1888; Rao & Verma in Bull. bot. Surv. India 12(1-4): 142. 1970. - - Gonyanthes pusilla Wall. ex Miers. in Trans. Linn. Soc. London 18: 537. t. 38. f. 3. 1841. - - Burmannia pusilla (Miers.) Thw. Enum. 325. 1864 (Plate 101 D).

Annual herbs. Stems 4-10 cm high. Radical leaves very small, 3-nerved; cauline leaves reduced to bract-like. Flowers 2-3 together(sometimes 6) or solitary, blue or whitish-blue; bracts 3 mm long; perianth tube 4-5 mm long; segments 6, in 2 series; outer 3, ovate, 2 mm long; inner lanceolate, 1.5 mm long; stamens 3; filaments short; anthers included. Ovary 3-locular with axile placenta; wings elliptic, acute at base and truncate at apex, 1 cm long. Capsules ovoid, indehiscent. Seeds copious, flat with brownish

Plate 100 A. Burmannia disticha Linn. (Habit), B. Flower, C. Flower open out, D. Burmannia candida Griff. E. Flower, F. Flower disected.

black ends.

Common in open areas, specially in fallows, associated with herbaceous plants.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 3067 Shillong.

Burmannia disticha Linn. Sp. Pl. 287. 1753; Hook.f. Fl. Brit. India 5: 664. 1888; Rao & Verma in Bull. bot. Surv. India 12(1-4): 142. 1970 (Plate 101 A).

Erect, marshy herbs with perennial rootstocks. Stems 30-70 cm high. Rosette leaves lanceolate, 6 x 1 cm, subacute, nerves obscure; cauline leaves reduced to scales. Flowers bisexual, few, secund on forked apex of the stem, deep blue, winged. Perianth 6, in 2-series, superior, blue; stamens 3, filaments very short; anthers included, yellow; styles 1, ovary inferior, 3-locular. Fruit a winged capsule with persistent perianth. Seeds copious, minute.

Common in marshy areas usually associated with grasses and sedges.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1015 Shillong; 1868 Cherrapunjee (Khasi Hills); 1808 Jowai (Jaintia Hills).

Burmannia nepalensis (Miers) Hook.f. has also been reported by Rao & Verma from the area of study based on old collection, but not encountered in our present study.

Orchidaceae

Juss. Gen. 64. 1789.

Perennials. Saprophytic or free-living, terrestrial or epiphytic. Stems herbaceous, simple or variously thickened forming a pseudobulb. Leaves simple, alternate, opposite or spiral on the axis, or at the apex of the pseudobulb. Flowers bracteate, bisexual, irregular, often showy. Perianth 6, in 2-series, 3 outer segments more or less similar, 2 lateral segments sometimes connate in a short or long sac or spur-like base; 3 inner segments dissimilar, 2 lateral segments similar, the median posterior segment forming labellum or lip, a conspicuous structure of various shapes, often the labellum is produced into sac or spur-like structure containing nectar. Stamens usually 1, rarely 2, united with the style in a column opposite to lip; anther 1 or sometimes 2, on the front tip or back of the column, free or adnate to it, 2-4-celled, sometimes produced into a beak called rostellum; pollen grains usually coherent into 2 or 4 pairs of sac-like, globose or pyriform, waxy, or powdery pollinia; pollinia free or adnate to a caudicle. Stigma of 1 or 2 viscid spots on the column, opposite the lip below the anther; ovary 1-celled, linear or twisted; ovules numerous, minute. Fruit a capsule. Seeds minute, testa hyaline. Endosperm 0.

K E Y T O G E N E R A

1a. Saprophytes.

2a. Stems stout, up to 2 m high; racemes branched; flowers large. . . . . Galeola

2b. Stems slender, less than 50 cm high; racemes unbranched; flowers small.

3a. Stems triquetrous, with a large, leafy bract below the raceme; flowers 1-2, lip entire, hemispherical; pollinia without caudicle . . .... Pantlingia

3b. Stems cylindric, with membranous sheaths; flowers numerous; lip obovate-oblong, irregularly crenate; pollinia with long, slender caudicles . . . . . Epipogium

1b. Free living.

4a. Terrestrials.

5a. Leaves conduplicate in bud; lip slipper-shaped; anthers 2. . . . . Paphiopedilum

5b. Leaves otherwise; lip not slipper-shaped; anther 1.

6a. Leaves 2-3, flowers solitary, terminal; rostellum arm long, turned upwards . . Diploneris

6b. Leaves numerous, if few then flowers not solitary; rostellum arm otherwise.

7a. Stems tall up to 2 m high, jointed, leafy all over, bamboo-like; lip trumpet-shaped . . . . . Arundina

7b. Stems less than 50 cm high, not jointed, if jointed then not bamboo-like; lip otherwise.

8a. Floral bracts leafy, larger than flowers . . . . . Brachycorythis

8b. Floral bracts not leafy, smaller than flowers.

9a. Leaves coriaceous, or subplicate.

10a. Stems green, herbaceous or woody not succulent.

11a. Spur absent.

12a. Flowers secund, unequally on spiral rachis; usually small; lip entire. . . Spiranthes

12b. Flowers otherwise, on straight rachis, green; lip lobed . . . Herminium

11b. Spur present.

13a. Spur short, or long, ovary erect, close to the rachis. . . . . Peristylus

13b. Spur usually long; ovary spreading, if erect not close to rachis. . . . . Habenaria

10b. Stems usually brown or pale white, never green, herbaceous, succulent.

14a. Stems decumbent below; sepals spreading; stigma not forked . . . . . Goodyera

14b. Stems erect; sepals connate, if free not spreading; stigma 2-fid.

15a. Sepals united at least in the lower half; lip papillose within . . . . . Cheirostylis

15b. Sepals free throughout; lip glandular within . . . . . Zeuxine

9b. Leaves plicate.

16a. Leaves arranged all over the stem; peduncle short, or absent.

17a. Epichile 4-ribbed; sepals connivent masking the lip; spur not longer than ovary; flowers on short peduncles . . . . Cephalanthera

17b. Epichile not ribbed; sepals spreading; spur much longer than the ovary; flowers at the axils of uppermost leaves, sessile.. Platanthera

16b. Leaves radical or subradical; peduncles long, prominent.

18a. Pseudobulbs present.

19a. Pseudobulbs variously shaped, usually elongated, jointed; leaves appearing before flowering; peduncles branched or simple; lip with a rounded conical spur . . . . . .Eulophia

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19b. Pseudobulbs ovoid, not jointed; leaves appearing along or before flowering; peduncles simple, rarely branched; lip with pointed, conical spur, or spur absent.

20a. Spur absent; sepals and petals free, spreading; column winged towards the apex . . Spathoglottis

20b. Spur present; sepals and petals connate; column not winged.

21a. Viscidium of pollinia rising from the apex, rudimentary and irregular.

22a. Lip more or less flat with hollow auricled lobes; pollinia persistent . . ... Malaxis

22b. Lip adnate to the base of column; lobes absent or if present not auriculate; pollinia deciduous.

23a. Basal lobes of lip large, sagittate, rarely absent; column short, not winged . . . . . Microstylis

23b. Basal lobes of lip absent; column long, curved, slightly winged... Liparis

21b. Viscidium of pollinia distinct and regular.

24a. Pseudobulbs clothed with fibrous sheaths; lip with long slender spur; column short, adnate to the base of lip; sepals and petals free, flowers not tubular; capsules ovate-lanceolate ..... Calanthe

24b. Pseudobulbs naked, not clothed with fibrous sheaths; lip with short rounded or conical spur; sepals and petals connate forming a tubular flower; capsules linear-lanceolate . . Anthogonium

18b, Pseudobulbs absent.

25a. Stems clothed with brown tubular sheaths at each node; leaves crowded near the apex of the stem; flowers dense, in terminal spike; pollinia 2. . . . . Tropidia

25b. Stems otherwise; leaves arranged all over the stem; flowers in lax, lateral or terminal racemes; pollinia 8. . . . . Phajus

4b. Epiphytes.

26a. Pseudobulbs absent.

27a. Leaves absent or reduced to sheaths at the base of the terete stems; flowers lateral, in a solitary capitate head . . . . . Ceratostylis

27b. Leaves present; stems otherwise; flowers in other types of inflorescence.

28a. Stems elongated.

29a. Leaves linear acute, stems clothed with straw-coloured, shining sheaths; flowers in terminal capitate heads . . . Agrostophyllum

29b. Leaves otherwise; stems naked, if clothed, not by straw-coloured, shining sheaths; flowers in axillary, leaf-opposed or in terminal racemes.

30a. Leaves equitant, laterally compressed; flowers in terminal racemes . . Podochilus

30b. Leaves not as above, if equitant flowers not in terminal racemes.

31a. Stems erect, or pendulous with distinct nodes and internodes.

32a. Flowers 1-4, white, terminal; lip trumpet-shaped; stems leafy all over. . . . . Thunia

32b. Flowers numerous, various in colour, axillary, rarely terminal; lip not trumpet-shaped; stems naked at least in the lower portion . . Dendrobium

31b. Stems pendulous or erect without distinct nodes and internodes.

33a. Leaves terete.

34a. Spur with swollen callus at the mouth; pollinia 4. . . . . Schoenorchis

34b. Spur without swollen callus; pollinia 2. . . . . Luisia

33b. Leaves flat.

35a. Lip spurless.

36a. Lip adnate to the column; apical lobes of lip thick, concave, compressed, entire at the apex . . . . . Stauropsis

36b. Lip jointed to the column, with a stout horn at the back or sometimes horn absent . . . . . Ronanthera

35b. Lip spurred.

37a. Spur without callus or septum within, usually long, conical, turned upwards, closing the mouth of flowers . . . Aerides

37b. Spur usually with callus within, short, if long not turned upwards and not closing the mouth of flowers.

38a. Spur deep, laterally compressed, hairy at the mouth . . . . Rhynchostylis

38b. Spur shallow or deep not laterally compressed, glabrous.

39a. Flowers opening many simultaneously; spur without internal calli or appendages; pollinia with broad stipe . . . . . Vanda

39b. Flowers opening singly at a time; spur with various appendages or calli on the back or front walls, sometimes blocking the mouth of the spur; stipe of pollinia narrower.

40a. Pollinia 2, often 2-fid; lip spurred.

41a. Lip base produced to a short truncate spur, interior of spur occluded by a dorsal scale or callus on the front and back walls; pollinia usually 2-fid . . Cleisostoma

41b. Lip base with a long or short acute or rounded spur, interior of spur otherwise; pollinia entire.

42a. Spur laterally compressed or flattened and tapering from mouth to tip, curved forwards; lip margin glabrous . . . . . Saccolabium

42b. Spur not compressed; usually short and straight; lip margin fimbriate . . Gastrochilus

40b. Pollinia 4 or 8; lip spurred or spurless.

43a. Pollinia 8; column appendaged . . . . Appendicula

43b. Pollinia 4; column not appendaged.

44a. Lip superior, spur without any callus or appendage . . . . . Acampe

44b. Lip inferior; spur with callus or appendage.

45a. Spur cavity divided by callus into two lateral chambers . . . . . Sarcanthus

45b. Spur cavity without lateral chambers.

46a. Spur with tongue-like projection, on the back wall, or at the base of the lip.

47a. Callus at the base of the lip raised, almost blocking the mouth of the spur; anthers with a long upcurved beak . . . Schoenorchis

47b. Callus at the back of the wall of spur, not closing the mouth of the spur; anthers with short, striaght, or incurved beak . . . . . Pomatocalpa

46b. Spur without tongue or projection, either at the base of the lip or at the back of walls.

48a. Calli at the base of the midlobe large, and partially closing the mouth; apex not curved . . . . . Camarotis

48b. Calli absent; apex of midlobe curved . . Uncifera

28b. Stems reduced.

49a. Leaves ensiform, laterally compressed; flowers in curved or erect spike . . . . . Oberonia

49b. Leaves not ensiform, if ensiform then not laterally compressed; flowers in racemes.

50a. Leaves numerous, linear, 30-60 cm long, spirally arranged on the swollen base of the stem.

51a. Flowers creamy white, funnel-shaped, in dense, curved racemes; sepals connate; pollinia obovate, not adpressed on the gland . . . .Cyperorchis

51b. Flowers purple, brown, or yellowish-white, not creamy; spreading in lax, erect or pendulous racemes; sepals free; pollinia deltoid and adpressed to one another on a gland . . Cymbidium

50b. Leaves few, lanceolate or oblong, less than 30 cm long; distichous on short stem.

52a. Spur absent; column short with 2 horn-like appendages at its base . . . . . Phalaenopsis

52b. Spur present; column short, or long, without appendages.

53a. Racemes profusely branched, much longer than leaves; flowers numerous; lip bilobed, lobes fimbriate; spur L-shaped . . .Ornithochilus

53b. Racemes unbranched, as long as or shorter than leaves; flowers few (1-3), lip 3-lobed, lobes glabrous; spur incurved, not L-shaped . . Doritis

26b. Pseudobulbs present.

54a. Stems branched, each branch ending in an oblong, flattened pesudobulb . . . . . Epigeneium

54b. Stems unbranched; pseudobulbs variable, chain-like, or solitary, not at the end of each branch.

55a. Pseudobulbs continous, chain-like, or solitary; bracts persistent or deciduous.

56a. Spikes pendulous, dense-flowered; bracts persistent; column short with broad wing round the anther . . . . . Pholidota

56b. Spikes erect, if pendulous, bracts deciduous; column long or short without wing . . Otochilus

55b. Pseudobulbs never chain-like; bracts deciduous, rarely persistent.

57a. Viscidium of pollinia distinct and regular.

58a. Lip spurless; pollinia stalked, sepals connate by their margins under the lip; terminal portion of the lip produced to a tongue-like point . . . . . Ione

58b. Lip spurred or not, pollinia sessile; sepals free, terminal portion of the lip not produced.

59a. Flowers in umbellate racmes or sometimes solitary, lateral sepals shorter than dorsal sepal; lip long, tapering to an acute apex; column short with 2-4 tooth-like appendages at the apex . . . Cirrhopetalum

59b. Flowers not in umbellate racemes; sepals subequal; lip not as above; column without appendages.

60a. Flowers distichous, with erect persistent bracts; lip sessile at the base of column, tongue-like . . . . . Sunipia

60b. Flowers otherwise; bracts spreading, if erect, then deciduous; lip otherwise.

61a. Lip small, recurved; column short, often long pointed, toothed.

62a. Flowers solitary; anther with an elongated horn . . . . . Trias

62b. Flowers numerous, rarely 1; anther without a horn . . . Bulbophyllum

61b. Lip large, erect or decurved; column thick not pointed.

63a. Lip posterior to the axis, decurved, adnate to the short foot of column . . Phreatia

63b. Lip anterior to the axis, erect, free or adnate to the column . . . . . Thelasis

57b. Viscidium of pollinia not distinct, usually rising from the apex.

64a. Flowers secund, tubular; lip included; pollinia 8, attached to a gland . . . Cryptochilus

64b. Flowers otherwise; spreading, rarely tubular; lip and pollinia not as above.

65a. Inflorescence terminal on the pseudobulb; flowers usually large and showy; pollinia 4, with distinct caudicle.

66a. Spur absent; column with distinct foot.

67a. Lip distinctly 3-lobed, lateral lobes of lip not rising above the column . . .. Coelogyne

67b. Lip obscurely lobed, or entire, enclosing the column . . . . . Pleione

66b. Spur present; column with distinct foot . . . . . Neogyne

65b. Inflorescence lateral on the pseudobulbs; flowers small; pollinia 4 or 8; caudicles reduced or 0.

68a. Pseudobulbs ovoid, discoid, reticulate; flowers solitary, rarely 2; sepals free ..... Porpax

68b. Pseudobulbs elongated, or ovoid, not reticulate; flowers numerous, rarely 2; sepals tubular . . . . . Eria

Acampe Lindl.

Epiphytic with long, stout branched stems. Leaves thickly coriaceous, unequally 2-fid, base sheathing. Flowers in racemes or panicles; sepals and petals with red horizontal stripes and spots; lip spurred at base, sidelobes erect, midlobe falcate, or bent, hairy at base; column short with small horn-like structure at the back. Pollinia 4, unequal, in 2 pairs.

K E Y T O S P E C I E S

1a. Flowers in sparingly branched panicle . . longifolia
1b. Flowers dense, in corymb . . . . . papillosa

Acampe longifolia (Hook.f.) Lindl. Fol. Orch. Acampe 1. 185 Tuyama in Hara, Fl. East. Himal. 2 Rep. 176. 1971. - - Saccolabium longifolium Hook.f. Fl. Brit. India 6: 62. 1890; King et Pantl. in Ann. roy. Bot. Gard. Calc. 8: 220. t. 292. 1898.

Stems stout, clothed with dry sheaths. Leaves distichous, 20-40 x 2-3 cm, oblong, coriaceous, unequally notched; raceme or panicles leaf-opposed, shorter than leaves, few-flowered. Flowers 8 mm across, shortly pedicelled; sepals elliptic-oblong, obtuse, petals smaller than sepals; lip short, saccate, 3-lobed, sidelobes triangular, acute, ovate, midlobes transversly wrinkled in the upper surface; column stout, Capsules 2 cm long.

Occasional on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Deka (without No.) Umsaw, Khasi Hills, (ASSAM).

(Linn.)

Acampe papillosa Lindl. Fol. Orch. 2.1853. ♀ - Saccolabium papillosum Lindl. in Edw. Bot. Reg. 18. t. 1552. 1833; Hook.f. Fl. Brit. India 6: 63. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 219.t. 290. 1898.

Stems stout, up to 60 cm long, Leaves 6-10 x 1-2 cm, coriaceous, thick. Flowers dense, in corymb, shortly pedicelled. Flowers 1-1.5 cm across; sepals and petals subequal, reddish-pink; lip pink, spur fleshy, shorter than petals. Capsules 2-3 cm long, oblong, linear or subclavate, turbinate.

Common on tree trunks, hanging on branches.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 3136 Tasak (Garo Hills).

Aerides Lour.

Epiphytic with leafy stems. Pseudobulbs absent. Leaves flat or terete. Flowers numerous, showy in dense or lax, decurved racemes; floral bracts minute; sepals broad, lateral sepals adnate to the base of column; petals similar to sepals; lip adnate to column, spurred; sidelobes small or 0, midlobe incurved between the sidelobes; column short with short or long foot; anthers 2-celled; pollinia 2, sulcate.

K E Y T O S P E C I E S

1a. Leaves terete . . . . . longicornu

1b. Leaves flat.

2a. Flowers 3 cm across; lip closely connate to the centre, exposing the curved spur . . . . . odoratum

2b. Flowers smaller than above; lip otherwise. . . . . multiflorum

Aerides longicornu Hook.f. Icon. Ined. 2127. 1889; et Fl. Brit. India 6: 44. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 211.t. 181. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 176. 1971.

Stems slender, 30-60 cm long, tufted or solitary, with roots, thick, usually clothed with dry sheaths. Leaves terete, 10-15 cm long, acute. Peduncles stout, 2 cm long, few-flowered. Pedicels as long as peduncles. Flowers 2-2.5 cm across, white with pink spur. Lateral sepals 1 cm across, subfalcate; petals orbicular smaller than sepals; spur long, as long as or slightly shorter than perianth segments, pinkish-white; lip adnate to the foot of column, 3-lobed, midlobe membranous, decurved, cuneiform. Capsules 4-5 cm long, clavate.

Common on tree trunks in forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 1567 Shillong peak.

Aerides multiflorum Roxb. Cor. Pl. 3: 63. t. 271. 1820; Hook.f. Fl. Brit. India 6: 44. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 212. t. 283. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 177. 1971.

Stems stout, 2-6 cm long. Leaves 15-30 x 1-2 cm, channelled keeled, apex obliquely 2-lobed. Racemes pendulous, 20-30 cm long, dense-flowered. Flowers 1-1.5 cm across, pink. Pedicels 0.5-1 cm long. Sepals and petals subequal, oblong with rounded tip; lip longer than sepals and petals, recurved, geniculately inflexed; spur 8 mm long, pink. Capsules oblong, 2 cm long.

Common on tree trunks, in forests.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1278 Burnihat, 1979 Shillong, (Khasi Hills); 1648 Tasak (Garo Hills); 1740 Sohkha (Jaintia Hills).

Aerides odoratum Lour. Fl. Cochinch. 2: 525. 1790; Hook.f. Fl. Brit. India 6: 44. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 212. t. 282. 1898.

Roots very thick, 5 mm across, branched. Leafy stems slightly compressed, completely clothed with leafsheaths above. Leaves distichously arranged, 20-25 x 4-5.5 cm, sessile, coriaceous, apex unequal, obliquely acute, keeled at the back. Racemes axillary, dense-flowered. Flowers whitish with purple perianth, 3 cm across. Lip closely connate to the centre, recurved forwards, exposing the curved spur, 3-lobed, lateral lobes broad, 1 cm across, oblique, incurved; midlobe linear, tongue-like, deep purple, recurved, spur horn-shaped, outcurved as a result of the union of column and lip. Anther depressed, triangular. Capsules oblong, turbinate.

Occasional in forests, on tree trunks.

Fls. & Frts. : June to July.

Specimens examined: Myrthong 2991 Tura peak (Garo Hills).

Agrostophyllum Bl.

Epiphytic. Stems tufted, clothed with leaf-bases. Leaves distichous, linear, sheaths flat, persistent, straw-coloured, shining. Flowers small, in terminal head-like spike. Sepals concave, connate to form a sac; petals similar to sepals; lip entire or 3-lobed, adnate to the short foot or column, base saccate; column short, not cleft. Pollinia 4-8, united in a disc.

K E Y T O S P E C I E S

1a. Stems stout, leafy towards the apex only; petals broad, 5-many-nerved; lip ovate to oblong, 3-lobed. . . . . callosum

1b. Stems slender, leafy throughout; petals linear, 3-nerved; lip reniform in the upper part . . khasiana

Agrostophyllum callosum Reichb. f. in Schmann Fl. Vit. 296. 1868; Hook.f. Fl. Brit. India 5: 824. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 155. t. 212. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 177. 1971; Rao & Balak. in Rec. bot. Surv. India 20(2): 204. 1973.

Stems 30-40 cm high, leafy towards the apex only. Leaves rigid, alternately arranged with overlapping sheaths, blades 10-15 x 0.6-1 cm, narrowed or rounded at notched apex, articulating at base. Spikes dense-flowered; bracts 2.5-3 cm long, coriaceous. Flowers pink. Sepals cuneate, 5-7-nerved; petals orbicular, many-nerved; lip variable, obscurely 3-lobed; sub-basal callus very large and laternal ones smaller; ovary angled; lip apiculate or emarginate, decurved. Capsules 1-2 cm long.

Common on tree trunks as well as on rocks, both in pine and broad leaved forests.

Fls. & Frts. : April.to July.

Specimens examined: Myrthong 1664 Shillong peak.

Agrostophyllum khasianum Griff. in Calc. Journ. Nat. Hist. 4: 378. t. 19. 1844; Hook.f. Fl. Brit. India 5: 824. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 154.t. 210. 1898.

Stems tufted, 10-20 cm high, leafy all over. Leaves linear, unequally 2-lobed, 1 lobe shorter than the other, lobes rounded. Spikes capitate, terminal. Flowers pink, small, 6-8 mm across; bracts linear; sepals 3-nerved, acute; petals oblong; lip shorter than sepals, pinkish-green, spreading.

Common on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3239 Shillong peak.

Anthogonium Wall. ex Lindl.

Anthogonium gracile Lindl. Gen. Sp. Orch. 426. 1840; Hook.f. Fl. Brit. India 5: 822. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 96.t. 134. 1898; Rao & Balak, in Rec. bot. Surv. India 20(2): 205. 1973; Tuyama in Hara, Fl. East. Himal. 3 Rep. 137. 1975.

Grass-like orchids. Pseudobulbs green, ovoid. Leaves 10-20 x 0.5-1.5 cm, plicate, linaar-lanceolate, acute, narrowed to a sheathing petiole. Scapes 15-30 cm high, 2-3-nodded with small

scale at each node; bracts 5-6 mm long, acute. Flowers pink, 0.6-1 cm across; sepals connate, tubular, spreading at the apex; petals embraced by sepals; lip broader than sepals and petals, reflexed. Capsules linear-lanceolate, 2-4 cm long, obtusely angled.

Common on walls and along old road cuttings, on cliffs, etc. mainly associated with grasses.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1127 Shillong, 1845 Mylliem (Khasi Hills).

Appendicula Bl.

Appendicula bifaria Lindl. in Kew Journ. 7: 35. 1855; Hook. f. Fl. Brit. India 6: 82. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 248.t. 330. 1898.

Epiphytic. Roots tufted. Stems weak, slender, pendulous or erect, 20-40 cm high, leafy all over, lower leaves deciduous. Leaves distichous, equitant, 2-2.5 x 0.5-1 cm, sessile, obovate, apex retuse, rounded or obliquely acuminate, base articulating, sheath funnel-shaped, spreading. Peduncles terminal, very short, 1-2 cm long, few-flowered. Flowers 2-3 mm across; sepals obtuse, 1.5 mm long; petals oblong, 3-nerved; lip slightly constricted below the middle; column truncate, obliquely 2-lobed, shorter than sepals and petals. Capsules small, clavate, 5-8 mm long, obtusely ribbed.

Rare, in dense forests on tree trunks.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 2967 Jowai (Jaintia Hills).

Arundina Bl.

Arundina graminifolia (D. Don) Hochr. Bull. N. Y. Bot.Gard. 6: 270. 1910; Rao & Balak. in Rec. bot. Surv. India 20(2): 205. 1973. - - A. bambusifolia Lindl. Gen. Sp. Orch. 125. 1831; Hook. f. Fl. Brit. India 5: 857. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 113. t. 156. 1898. - - Bletia graminifolia D. Don Prodr. Fl. Nepal. 29.1825.

Tall bamboo-like orchids, stems 30-200 cm high; leaves spirally arranged on the stem, 10-25 x 1-3 cm, linear, acute, sheathing at base, 5-7-nerved, Racemes terminal, few-flowered; bracts minute, membranous. Pedicels 2-3 cm long. Flowers 2-4 cm across, pink or white-rose. Sepals linear-oblong, or linear-acute, 2-3 cm long; petals broader than sepals; lip broad, concave, trumpet-shaped, tinged with deep pink. Pollinia 2, at the tip of the column; capsules ellipsoid, grooved, 4-5 x 2-3 cm.

Common in grasslands and in forest margins, specially on old road cuttings.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1309 Pynursla (Khasi Hills); 1964 Baghmara (Garo Hills).

Brachycorythis Lindl.

Terrestrials. Tubers numerous. Stems erect, leafy, simple. Leaves cauline, ovate or ovate-lanccolate. Flowers pinkish or rose coloured or yellow, in racemes at the axils of large leaf-

like bracts. Lateral sepals free, dorsal sepals erect, convex. Petals free or slightly adnate to column. Lip erect, or deflexed, longer than sepals and petals; saccate or spurred at base, limbs 2-3-lobed; column slender or broad. Pollinia pyriform. Rostellum hooded, 3-fid. Capsules erect.

K E Y T O S P E C I E S

1a. Hypochile up to 5 mm long . . . . . obovalis

1b. Hypochile more than 5 mm long.

2a. Epichile acute at apex; lip yellowish-green, with yellow spot at the base . . . . acuta

2b. Epichile rounded, emarginate or truncate; lip purple, without yellow spot at the base . . . . . henryi

Brachycorythis acuta (Reichb.f.) Summerh. in Kew Bull. 2: 238. 1955; Seidenfad. in Dansk Bot. Ark. 31(3): 10.t. 1. 1977. Gymnadenia acuta Reichb.f. Otia Hamb. 32. 1878. - - Phyllompax acuta (Reichb.f.) Schltr. Fed. Repert. Beih. 4: 119. 1919. - - Platanthera acuta (Reichb.f.) Krzl. Orch. Gen. Sp. 1: 611. 1899.

Roots fleshy. Stems 15-30 cm high, leafy. Leaves alternate, 2-4 x 0.8-2 cm, oblong-lanceolate, sheathing at base. Flowers 1 cm across, pinkish-white; sepals 8 mm long, cuneate; petals smaller than sepals. Lip ovate-lanceolate, acute, yellowish-green; epichile acute at apex, base with yellow spot. Capsules ribbed, erect, 1-1.5 cm long.

Common in forest clearings, associated with grasses and other herbaceous plants.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 1801 Marmgor (Khasi Hills).

Brachycorythis henryi (Schltr.) Summerh. in Kew Bull. 2: 235. 1955; Seidenfad. in Dansk Bot. Ark. 31(3): 10.t. 2. 1977. - - Phyllompax henryi Schltr. Fed. Repert. Beih. 4: 45, 119. 1919.

Roots tuberous, 8 mm across. Stems 50-60 cm high, leafy. Leaves 4 x 2-2.5 cm, alternate, ovate, acute; midrib more prominent. Upper leaves gradually reduced. Flowers pinkish-white, 2 cm across. Sepals 6 mm long, subfalcate, 3-nerved; petals much smaller than sepals, 2-nerved. Lip broad, 1-1.5 cm across, slightly clawed, retuse or crenulate at apex; spur conical; epichile rounded at apex. Capsules 2 cm long, obtusely angled.

Common in secondary forests, associated with herbaceous plants.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 3272 Way to Kyrdemkulai (Khasi Hills).

Brachycorythis obovalis Summerh. in Kew Bull. 2: 237. 1955; Seidenfad. in Dansk Bot. Ark. 31(3): 15.t. 4. 1977.

Stems 20-30 cm high, jointed. Leaves 3-7 x 1-2 cm, ovate, lanceolate, acute, base sheathing. Flowers solitary, axillary, pinkish-white, 2 cm across. Sepals lanceolate; petals similar to sepals. Lip 1.5 cm across, tetuse, epichile narrowly obovate, truncate or rounded, spurred at the base, hypochile 5 mm long, tapering to the incurved apex. Capsules lanceolate, ribbed.

Common in shrubby areas, associated with herbaceous plants.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 3269 Bhoilbong; 3271 Kyrdem-kulai (Khasi Hills).

Bulbophyllum Thouars.

Epiphytic with pseudobulbs. Leaves 1 (rarely 2). Flowers solitary or in heads or in umbels, from the rhizomes. Sepals subequal, lateral ones larger, and adnate to the column; petals unequal, usually smaller than sepals; lip adnate to the foot of column, recurved; column short, foot stout, long; anthers 2-celled; pollinia 4, free, the 2 inner smaller or sometimes obsolete.

K E Y T O S P E C I E S

1a. Rhizomes creeping with moniliform pseudobulbs, scape capillary, 1-flowered . . . . . moniliforme

1b. Rhizomes short, if creeping pseudobulbs not moniliform; scape stout, 1-many flowered.

2a. Scapes 1-flowered, rarely 2-3.

3a. Pseudobulbs crowded, on short rhizome.

4a. Pseudobulbs oblong, usually falcate; sepals 9-nerved; petals 7-nerved; lip with long stalk . . . . . leopardinum

4b. Pseudobulbs ovoid, straight; sepals 5-nerved; petals 3-nerved; lip stipitate, oblong, obtuse . . . . . griffithii

3b. Pseudobulbs distant on short or long, woody rhizomes.

5a. Scapes 1-3-flowered; sepals much longer than petals; lip linear, obtuse; leaves elliptic, long petioled . . . . . striatum

5b. Scapes 1-flowered; sepals equalling petals, falcate; lip petal-like, subspathulate; leaves oblong . . affine

2b. Scapes many-flowered.

6a. Flowers in capitate or subumbellate racemes.

7a. Scapes filiform, recurved from the pseudobulbs; sepals and petals subequal, 3-nerved ; spur slender; flowers directed downwards . . . cauliflorum

7b. Scapes stout or slender, erect; sepals and petals otherwise, unequal; spur absent or if present very short; flowers erect, not directed downwards.

8a. Bracts long; sepals finely acuminate; lateral sepals without pouch at the base. . . . .leptanthum

8b. Bracts short; sepals otherwise; lateral sepals with pouch at the base . . . . . confertum

6b. Flowers in racemes or spikes.

9a. Scapes short, slightly longer than the pseudobulbs; petals minute, sharp pointed . . . . . caryeanum

9b. Scapes long, much longer than the pseudobulbs; petals larger than the above, rounded or acute not pointed.

10a. Racemes hairy; petals ciliate; lip hairy, linear-oblong . . . . . hirtum

10b. Racemes glabrous; petals glabrous; lip otherwise.

11a. Scapes flexuous; petals serrate at margin . . .. gymnopus

11b. Scapes stout; petals entire at margin.

12a. Scapes short, flowers minute in dense short spike; petals linear-oblong, obtuse, spongy . . . . . purpureum

12b. Scapes long, flowers conspicuous, in long, cylindrical spikes; petals lanceolate, acute, not spongy.

13a. Leaves linear, less than 1 cm across; rhizomes slender; racemes lax-flowered..reptans

13b. Leaves more than 2 cm across; rhizomes stout; racemes dense-flowered.

14a. Apices of leaves notched or 2-lobed; scape curved below the raceme . . . . cylindraceum

14b. Apices of leaves acute, not lobed; Scape straight . . . . . penicillium

Bulbophyllum affine Lindl. Gen. Sp. Orch. 48. 1830; Hook. f. Fl. Brit. India 5: 756. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 67. t. 91. 1898; Tuyama in Hara, Fl. East. Himal. 426. 1966.

Rhizomes prostrate, woody with tufted roots at the nodes. Pseudobulbs cylindric, 3-4 cm long, distant, 1-leaved. Leaves 10-25 x 2-3 cm, oblong, base narrowed to a channelled petiole, apex retuse or shallowly notched, lobes rounded, midrib prominent. Peduncles 2-3 cm long, clothed with membranous scales or sheaths, 1-flowered. Pedicels 6 cm long, slender; flowers 3-4 cm across, pinkish-brown. Lateral sepals connate at base, falcate, acute; dorsal ones straight, shorter than lateral sepals, 4-nerved; petals smaller than sepals, as long as dorsal sepals, 3-nerved; lip minute, 3-4 mm long, sidelobes minute, incurved. Capsules oblong-lanceolate, obtusely ribbed.

Common in forests on tree trunks and on rocks.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 2977 Balpagram (Garo Hills).

Bulbophyllum careyanum Spreng. Syst. Veg. 3: 732. 1826; Hook.f. Fl. Brit. India 5: 760. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 71.t. 97. 1898; Tuyama in Hara, Fl. East. Himal. 426. 1966.

Rhizomes clothed with dry brown scales. Pseudobulbs ovoid, conic, 1-leaved. Leaves 15-20 x 2-3 cm, oblong, or linear-oblong, base narrowed to petiole. Scapes longer than leaves, dense-flowered. Bracts linear-lanceolate, acute. Flowers 5 mm across, orange-yellow; sepals subequal, laterals shorter than dorsal sepal;

petals linear, minute; lip clavate, shortly clawed, entire, spotted brown. Column as long as the claw. Capsules elliptic or oblong, ribbed.

Common in forests on tree trunks and on rocks.

Fls. & Frts. : April to August.

Specimens examined: Swaminathan 50809 Orchidarium Botanical Survey of India (ASSAM).

Bulbophyllum cauliflorum Hook.f. Fl. Brit. India 5: 758. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 80. t. 110. 1898.

Rhizomes prostrate, rooting from below the pseudobulbs. Pseudobulbs small, 2-3 cm long, cylindric, or swollen. Leaves ovate, oblong, 5-10 x 1.5-2 cm, obtuse. Scapes weak, slender, as long as or longer than leaves, few-flowered; flowers 4 mm across, whitish-yellow; sepals linear, subequal, caudately acuminate, 3-nerved; petals as long as sepals, 3-nerved; lip shorter than sepals and petals, shortly clawed. Spurs conic, slender. Capsules small, up to 8 mm long, cuneate.

Occasional in forests on tree trunks.

Fls. & Frts. : October.

Specimens examined: Balakrishnan 42253 Jarain (Jaintia Hills) (ASSAM).

Bulbophyllum confertum Hook.f. Fl. Brit. India 5: 757. 1890;

Rhizomes short. Pseudobulbs crowded, ovoid, 4 cm long. Leaves 5-10 x 2 cm, oblong, acute. Scapes shorter than leaves, flowers few, in racemes; sepals acuminate, 5-nerved; petals shorter

than sepals, ovate-oblong, acute; lip minute, stipitate; column toothed at the back. Capsules oblong, with slender pedicels.

Occasional in forests, on tree trunks.

Fls. & Frts. April to June.

Specimens examined: Deka (without No.) Umsaw (Khasi Hills), (ASSAM).

Bulbophyllum cylindraceum Lindl. Gen. Sp. Orch. 53. 1830; Hook.f. Fl. Brit. India 5: 765. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 70.t. 96. 1898; Tuyama in Hara, Fl. East. Himal. 426. 1966.

Rhizomes stout, with tufted roots all over. Pseudobulbs absent. Leaves solitary, 15-25 x 3-4 cm, fleshy, oblong, broader in the lower half, apex shallowly 2-lobed, base narrowed to a fleshy petiole. Scapes as long as or longer than leaves, usually curved, clothed with brownish-green sheaths at nodes, floral bracts completely enclose the buds. Racemes elongating at maturity, dense-flowered, up to 10 cm long. Flowers whitish-pink. Sepals triangular, 3-4 mm long, laterals obtuse; petals smaller than lateral sepals, 1-nerved; lip ovate, purplish-green, entire. Capsules very small, ovoid, 2.5-4 mm long.

Common on tree trunks, in deep forests. This species is very close to B. penicillium but differs in notched leaf apex, and in decurved scape below the racemе.

Fls. & Frts. September to October.

Specimens examined: Myrthong 2988 Shillong peak.

Bulbophyllum griffithii Reichb. f. in Walp. Ann. Bot. 6: 247. 1861; Hook.f. Fl. Brit. India 5: 756. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 66. t. 147. 1898.

Rhizomes prostrate, 2 mm across; pseudobulbs small, obovoid, as broad as long, 1-leaved, yellow. Leaves oblong, 3-4 x 1.5 cm, obtusely 2-lobed, base narrowed to a short petiole. Scapes 5-10 cm long, slender, jointed with short bracts at the node. Flowers small, 1.5-2 cm across, greenish-yellow, brownish within. Sepals subequal, 5-nerved; petals obtuse, 3-nerved, yellowish-green; lip clawed, streaked brown within. Capsules clavate, ribbed.

Common on tree trunks and on rocks in forests.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 2978 Mawphlang (Khasi Hills).

Bulbophyllum gymnopus Hook.f. Icon. Pl. ined. et Fl. Brit. India 5: 764. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 68. t. 93. 1898.

Rhizomes woody, with tufted roots at the nodes. Pseudobulbs distant, cuneate or subcylindric, 1-3 x 0.5-0.8 cm, 1-leaved. Leaves 5-10 x 1.5-2 cm, oblong, apex rounded, shallowly retuse or notched, distinctly nerved; petioles 2 cm long. Scapes as long or longer than leaves, few-flowered, sheathed; sheaths with brown scales at the base. Bracts minute, caducous. Pedicels filiform, 1.5 cm long. Flowers 0.6-1 cm across, pinkish-white; sepals linear, acute; petals similar to sepals but broader; lip shorter than sepals and petals, sessile.

Common on tree trunks in forests.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 3092 Nongpoh (Khasi Hills).

Bulbophyllum hirtum Lindl. (in Wall. Cat. 1989. 1830 et Gen. Sp. Orch. 51. 1830; Hook.f. Fl. Brit. India 5: 762. 1890.

Rhizomes prostrate, pseudobulbs distant, 2-3 cm long, terete; leaves short, 10-20 x 3-4 cm, oblong-lanceolate. Scapes dense-flowered; flowers whitish-green; sepals falcate, 3-nerved; petals smaller than sepals, rounded or obtuse, ciliate; lip clawed, hairy below the middle. Spur short. Capsules 8 mm long, oblong.

Rare, on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Deka 21182 Nongpoh (Khasi Hills) (ASSAM).

Bulbophyllum leopardinum (Wall.) Lindl. Gen. Sp. Orch. 48. 1830; Hook.f. Fl. Brit. India 5: 756. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 67. t. 92. 1898; Tuyama in Fl. Hara, Fl. East. Himal. 2 Rep. 177. 1971. - - Dendrobium leopardinum Wall. Tent. Fl. Nepal. 39. t. 28. 1826.

Roots numerous, spreading. Pseudobulbs secund, falcate, 2-3 cm long, 1-leaved, yellow. Leaves solitary, oblong-lanceolate, 6-8 x 2.5-3.5 cm, rounded, many-nerved; petioles 2 cm long, channelled. Peduncles short, 1-flowered, clothed with membranous scales or bracts, bracts cymbiform, 1.5 cm long, acute, persistent. Flowers globose, pedicelled; sepals 9-nerved; petals broad,

7-nerved, ovate, acute, shorter than sepals; lip long, stalked, with toothed basal auricles. Capsules 2 cm long, truncate.

Rare, collected only once at Shillong peak on tree trunks.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 3034 Shillong peak.

Bulbophyllum leptanthum Hook.f. Icon. Pl. 1889; et Fl. Brit. India 5: 759. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 81. t. 112. 1898;

Rhizomes prostrate, pseudobulbs shortly distant, 2-2.5 cm long, cylindric; leaves oblong, obtuse, apex shallowly notched, base narrowed to a petiole, blades 4-8 x 1-2 cm. Scapes developing at the base of the pseudobulbs or on the side of the rhizomes, as long as or longer than leaves; flowers crowded, 5-6 mm across in umbellate racemes; sepals lanceolate, caudately acuminate, dorsal sepals 2 mm long; petals shorter than sepals, ovate, 1-nerved; lip longer than petals, ovate-oblong, decurved from the base of the lip; column triangular towards the apex. Capsules clavate, obtusely ribbed.

Rare; on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Deka 18337 Shillong (ASSAM).

Bulbophyllum moniliforme Par. et Reichb. f. in Trans. Linn. Soc. 30: 151. 1874; Hook.f. Fl. Brit. India 5: 757. 1890; Seidenfad. & Smitin. in Orch. Thail. 383.t. 3. 1961.

Rhizomes slender, creeping. Pseudobulbs 3-5 mm across, orbicular, closely arranged, forming an uninterrupted chain, 1-leaved. Leaves 1-1.5 x 0.2-0.5 cm, deciduous. Scapes sheathing at the base, 1-flowered; pedicels and ovary 1-1.5 cm long; bracts amplexicual, membranous. Flowers orange-yellow, 5-6 mm long, 6-7 mm across; sepals unequal, free, reflexed; dorsal sepals 5 mm long, elliptic, narrower and shorter than laterals; laterals oblong, 5 mm long; petals 2 mm long, 1-nerved; lip as long as petals, falcate, orange-yellow, 3-lobed; sidelobes rounded; midlobes depressed below, apex rounded; pollinia 2, semi-spherical. Capsules ribbed, 5-7 mm long,

Rare, reported here based on a solitary specimen from Jaintia Hills.

Fls. & Frts. : October to November.

Specimens examined: Deori 51737 Jarain (Jaintia Hills), (ASSAM).

Bulbophyllum penicillium Par.& Reichb.f. in Trans. Linn. Soc. 30: 151. 1874; Hook.f. Fl. Brit. India 5: 764. 1890; King et Pantl. in Ann. roy. bot. Card. Calc. 8: 79. t. 108. 1898.

Rhizomes woody. Pseudobulbs 2-4 cm long, ovoid or obconic, deep yellow, rooting below. Leaf 1, oblong, falcate, 10-15 x 2-3 cm, apex acute, base narrowed to a long petiole. Scapes longer than leaves, dense-flowered. Bracts linear-acute. Flowers 2 cm across, white; sepa ls narrow, subequal, 5-nerved; dorsals ovate, acute; petals smaller, oblong, obtuse; lip sessile, broad, hairy.

Rare, on tree trunks in deep forests.

Fls. & Frts. : August to October.

Specimens examined: Panigrahi 21926 Jarain (Jaintia Hills), (ASSAM).

Bulbophyllum purpureum Thw. Enum. 298. 1864; Hook.f. Fl. Brit. India 5: 768. 1890.

Pseudobulbs tufted, fusiform. Leaves 5-8 x 0.6-1.2 cm, oblong. Petioles 4 cm long, cylindric, Scapes shorter than leaves, dense-flowered. Flowers 4 mm across, white; sepals oblong, subequal, falcate, 3-nerved; petals filiform, as long as sepals, obtuse; lip clawed, entire, purplish-white. Capsules 5-6 mm long.

Rare, on tree trunks and moss covered rocks, in forests.

Fls. & Frts. : May to July.

Specimens examined: Balakrishnan 42283 Jowai (Jaintia Hills), (ASSAM).

Bulbophyllum reptans Lindl. Gen. Sp. Orch. 51. 1830; Hook. f. Fl. Brit. India 5: 768. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 77.t. 106. 1898; Tuyama in Hara, Fl. East. Himal. 427. 1966; Rao & Balak. in Rec. bot. Surv. India 20(2): 20. 1973.

Rhizomes slender, 1-2 mm across. Pseudobulbs fusiform, 5-8 mm long. Leaves solitary, 10-15 x 0.5-0.8 cm, linear, narrowed to a channelled petiole, apex obtuse, straight or slightly curved on one side, falcate. Scapes 5-10 cm long, few-flowered, sheathing at nodes. Flowers small. Bracts ovate-lanceolate, 5-8 mm long, acute. Sepals subequal, 4-5 mm long, acute, 3-nerved;

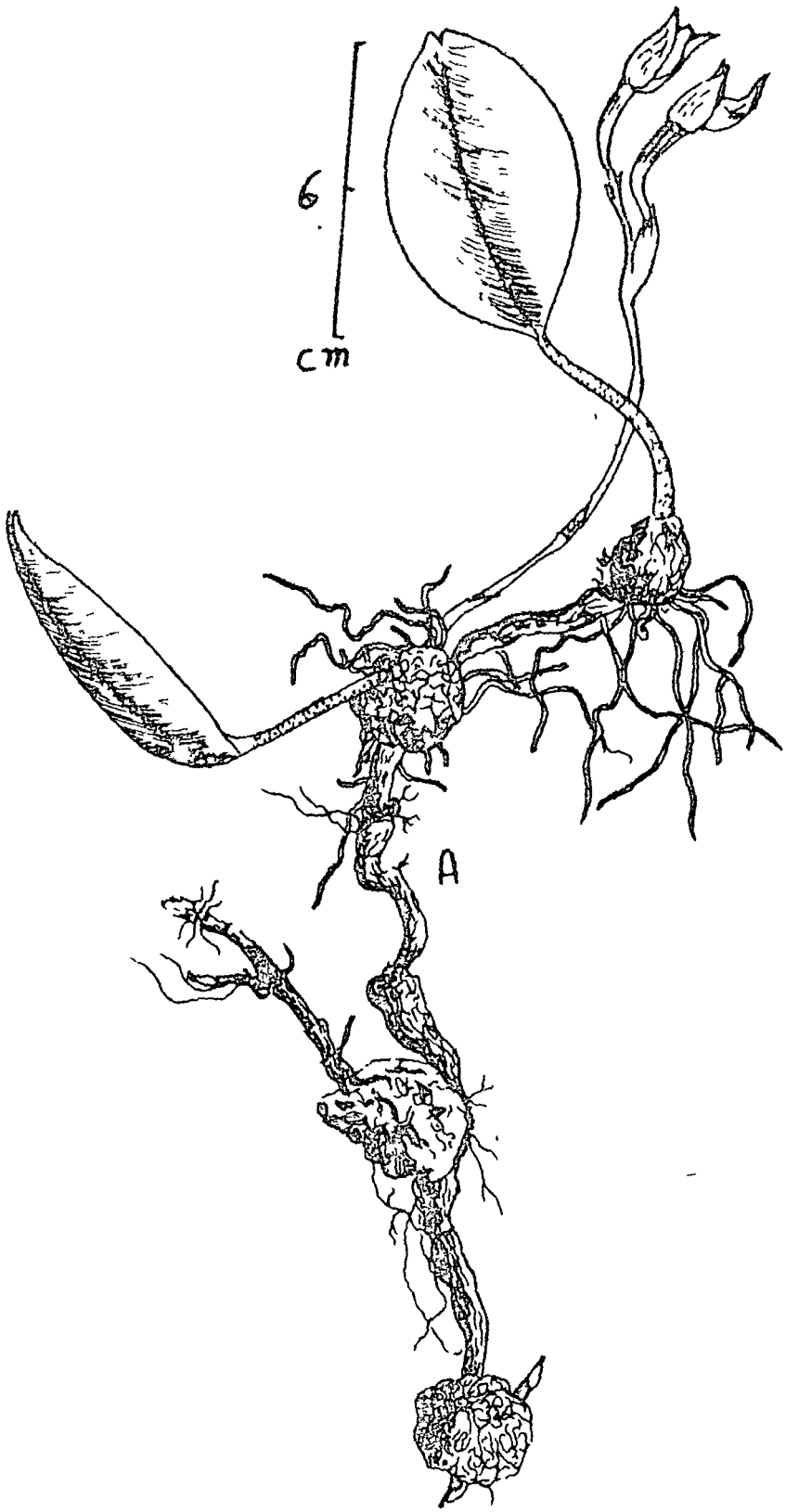

Plate *101* Bulbophyllum striatum Reich.f. A. Plant showing habit.

petals oblong, obtuse, pinkish-white; lip recurved, spurred at base. Capsules small, 5 mm long.

Common on tree trunks and rocks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1388 Mawsmai (Khasi Hills).

Bulbophyllum striatum Reichb. in Walp. Ann. 6: 257. 1861; Hook.f. Fl. Brit. India 5: 755. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 75. t. 102. 1898. (Plate 101).

Pseudobulbs 1-1.5 cm long, cuneiform, distant on rhizomes. Leaves solitary on each pseudobulb, elliptic, petioles 2-8 cm long, blades shorter than petioles, 3-4 cm across. Scapes longer than leaves, usually opposite to leaves, jointed, clothed with membranous bracts, on each joint. Flowers few, in racemes, yellowish-green, tinged with pink within. Pedicels filiform, 1-2 cm long; flowers 1 cm across; sepals cuneate; petals shorter than sepals; lip linear, obtuse. Capsules small, 6 mm long, ribbed.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1356 Nongpoh (Khasi Hills).

Calanthe R. Br.

Terrestrial orchids. Stems leafy with pseudobulbs. Leaves plicate, long petioled. Flowers in erect racemes; sepals subequal, spreading; petals similar to sepals; lip adnate to column at the base or all along, 3-lobed, midlobe deeply 2-fid. Pollinia 8, cohering in pairs by a granular viscus. Capsules drooping.

K E Y T O S P E C I E S

1a. Scapes developing in between the leaves; bracts much longer than ovary, usually 2-2.5 cm long; sepals and lip falcate . . . . . puberula

1b. Scapes lateral; bracts small, shorter than ovary, less than 2 cm long; sepals and lip not falcate.

2a. Sepals ovate-oblong; midlobe of lip retuse with 2 tubercled ridges . . . . . mannii

2b. Sepals ovate-lanceolate; midlobe of lip apiculate without tubercled ridges . . plantaginea

Calanthe mannii Hook.f. Fl. Brit. India 5: 850. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 167. t. 225. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 180. 1971.

Stems woody, very short. Leaves 2-3, lanceolate, plicate, 15-40 x 4-5 cm, acute, base narrowed to a petiole, outer leaves with broader sheathing base and inner with narrower petioles; scapes 30 cm high. Flowers pinkish-green, 5-8 mm across; bracts cuneate, 2-4 mm long, persistent; sepals falcate, acute; petals oblanceolate, as long as sepals; lip sessile, yellow, longer than sepals and petals, 3-lobed, lateral lobes longer than midlobe. Capsules 1 cm long, with persistent perianth.

Common both in secondary and dense forests.

Fls. & Frts. : May to August.

Specimens examined: Myrthong 1667, 1669 Shillong; 1835 Markasa (Khasi Hills).

Calanthe plantaginea Lindl. Gen. Sp. Orch. 250. 1833; et Fol. Orch. Calanthe 9. 1854; Hook.f. Fl. Brit. India 5: 853. 1890; Tuyama in Hara, Fl. East. Himal. 2 Rep. 180. 1071.

Pseudobulbs deep green. Stems 20-30 cm high, clothed with sheathing leaves. Leaves lanceolate, 40-50 x 5-15 cm, acute. Scapes shorter than leaves, few-flowered. Bracts green, deciduous. Non-flowering bracts leaf-like, 2-4 cm long. Flowers 1-2 cm across, brownish green. Sepals cuneate, 4-6 mm long; petals oblong, as long as sepals; lip longer than sepals and petals with longitudinal orange-yellow band. Capsules 4-5 cm long, beaked.

Rare, occasional along the streams in forests.

Fls. & Frts. : December to February.

Specimens examined: Myrthong 2935 Sunapahar (Khasi Hills).

Calanthe puberula Lindl. Gen. Sp. Orch. 352. 1833; Hook.f. Fl. Brit. India 5: 848. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 166. t. 224. 1898; Rao & Balak. in Rec. bot. Surv. India 20(2): 207. 1973; Tuyama in Hara, Fl. East. Himal. 3 Rep. 139. 1975.

Leaves 2-7, 10-30 x 4-6 cm, lanceolate, caudately acute, narrowed to a petiole. Scapes 30-40 cm high, slender with bracts at nodes. Racemes lax flowered. Flowers violet, 2-2.5 cm across; sepals equal, falcate, 5-nerved; petals linear, 3-nerved; lip oblong, falcate, 3-lobed, midlobe subulate, sidelobes broader. Capsules 1 cm long, obtusely ribbed.

Rare, collected only once at Mawmluh on rocky surfaces.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1864 Mawmluh (Khasi Hills).

Camarotis Lindl.

Camarotis mannii King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 239. t. 317. 1898.

Epiphytic. Roots long, tufted. Stems 30-50 cm long, leafy and rooting all over. Leaves coriaceous, 10-15 x 1.5 cm, apex primose, obliquely 2-lobed, with a small lateral sidelobe on the longer lobe, base sheathing. Peduncles leaf-opposed, much longer than leaves, curved, dense-flowered. Flowers 1.4 cm across, pink, spotted . Sepals and petals similar, 6 mm long, linear; dorsal sepals recurved near the base; lip clavate, spurred at the base, sidelobes 0. Spur cavity partially closed by the calli at the base of the midlobe; column twisted. Capsules 1 cm long.

Occasional on tree trunks in forests.

Fls. & Frts. : April to June.

Specimens examined: Myrthong 2975 Jowai (Jaintia Hills).

Cephalanthera Richard.

Cephalanthera ensifolia Richard Orch. Annot. 29. 1841; Hook.f. Fl. Brit. India 6: 125. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 271. t. 362. 1898.

Terrestrials. Stems 20 cm high, leafy. Leaves alternate, 2-6 x 1.5-2 cm, lanceolate, subacute, plicate, base sheathing. Flowers few at the axils of few uppermost leaves, white; sepals

obovate; petals similar to sepals; lip ovate-cuneate, with a ring of yellow crest, within. Column semiterete; pollinia 2. Capsules straight.

Common under pine forests, associated with grasses and other herbaceous plants.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 1660 Malki forest (Khasi Hills).

Ceratostylis Bl.

Ceratostylis teres Reichb.f. in Bonpland. 2: 89. 1854; Hook.f. Fl. Brit. India 5: 825. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 247. t. 329. 1898.

Stems tufted, terete, or cylindric, tapering to an acute apex, 15-30 cm high, deep green. Leaves reduced to sheaths at the base of stems. Flowers lateral, 2 cm below the apex of the stem, yellow within, greenish without; sepals cuneate or ovate, 1.5 mm long; petals similar and equal to sepals; lip 3-lobed, midlobe minute, spur clavate as long as or longer than sepals and petals. Capsules 5 mm long, ribbed, turbinate.

Rare, on tree trunks and on moss covered rocks in forests. Hooker states that the inflorescence developing on side of the terete leaf, but the leaf as stated by Hooker is the stem; our specimens clearly show the terete stem developing from the axil of the reduced leaf, and moreover leaves in the family Orchidaceae never bear flowers.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 2976 Jowai (Jaintia Hills).

Cheirostylis Bl.

Cheirostylis griffithii Lindl. in Journ. Linn. Soc. 1: 188. 1857; Hook.f. Fl. Brit. India 6: 105. 1890; King et Pantl. in Ann. Roy. bot. Gard. Calc. 8: 299. t. 397. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 181. 1971.

Terrestrials. Stems fleshy, pale white, 10-16 cm high. Leaves ovate, 2-5 x 1-2 cm, sheathing at base. Scape 10-15 cm long, 2-4 noded, with lanceolate acute bracts; flowers 5 mm across, white, pubescent; sepals connate to middle; petals narrower, spathulate; lip concave, with 2 glandular lamellae and 2 green bands within; column linear, clavate with linear appendages. Capsules oblong, clavate, hairy.

Common on hills under shrubs and pine forests, associated with grasses and other herbaceous plants.

Fls. & Frts. : January to March.

Specimens examined: Myrthong 3062 Shillong peak.

Cirrhopetalum Lindl.

Epiphytic orchids with pseudobulbs. Leaves 1-2, persistent, or deciduous. Flowers in umbels, rarely in racemes or solitary. Sepals subequal, dorsal concave, shorter than lateral ones; petals shorter than dorsal sepals; lip small, entire, adnate to foot of column, with 2-3 tooth-like appendages at the apex. Pollinia 4.

K E Y T O S P E C I E S

1a. Petals ciliate or fimbriate, lateral sepals up to 2 cm long, longer than dorsal ones . . . . . cornatum

1b. Petals glabrous; lateral sepals otherwise.

2a. Lateral sepals linear-lanceolate, much longer than dorsal one; lip convex . . . . . elatum

2b. Lateral sepals ovate-lanceolate, shorter or longer than dorsal sepal; lip otherwise.

3a. Lateral sepals broadened at the base; lip shorter than sepals; column short, without hooked processes . . . . . guttulatum

3b. Lateral sepals ovate-lanceolate; lip longer than sepals; column with falcate, hooked processes . . . . . viridiflorum

Cirrhopetalum cornatum Lindl. in Bot. Reg. Miss. 75. 1838; Hook.f. Fl. Brit. India 5: 774. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 87. t. 120. 1898.

Pseudobulbs ovoid, conic, 1-leaved. Leaves oblong-lanceolate, obtuse, petioles sheathing; Scapes as long as or shorter than leaves, few-flowered. Flowers long, pendulous, 2-3 cm long, hairy; sepals unequal, dorsal sepals convex, ovate, scabrid; laterals lanceolate, falcate, connate at base and apex; petals ovate; lip oblong, subacute, dilated at the base, entire; column triangular with erect teeth. Capsules 2 cm long, hairy.

Rare, on tree trunks and on rocks in forests.

Fls. & Frts. : May to June.

Specimens examined: Deka Mawsmai (without No.) (Khasi Hills), (ASSAM).

Cirrhopetalum elatum Hook.f. Icon. Pl. 1891; et Fl. Brit. India 5: 775. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 93. t. 130. 1898.

Pseudobulbs caespitose, cylindric, acute, 4-5 cm long, 1-leaved. Leaves oblong, lanceolate, 15-25 x 2-3 cm, tapering from

middle to a narrow base, apex retuse. Scapes as long as leaves, flowers dense towards the apex. Flowers 1.5 cm across; dorsal sepals free at the base, ovate, acute; laterals narrow-oblong, subacute; petals falcate; lip oblong, tapering to subacute apex, entire, base slightly dilated; column winged, decurved; foot slender. Capsules 1 cm long.

Common on tree trunks and on moist moss covered rocks in deep forests.

Fls. & Frts. : May to July.

Specimens examined: Panigrahi 4119 Jowai (Jaintia Hills), (ASSAM).

Cirrhopetalum guttulatum Hook.f. Fl. Brit. India 5: 776. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 94. t. 131. 1898.

Rhizomes thick, clothed with shining fibrous sheaths. Pseudobulbs 1-2 cm apart, conic or subcylindric, yellow, sometimes clothed with fibrous sheaths. Leaves solitary, oblong, 10-15 x 1.5-3 cm, apex rounded, shallowly notched, turning black when dry, base narrowed to a 2-2.5 cm long, channelled petiole. Scapes as long as or shorter than leaves, 2-3-nodded, with brown bracts at each node. Flowers few, in umbels. Pedicels 2-2.5 cm long; sepals spreading, yellow; petals ovate, obtuse; lip 6 mm long, pale purple; spur longer than sepals and petals.

Rare, on tree trunks in forests.

Fls. & Frts. : June to August.

Specimens examined: Hyrthong 1662 Nongpoh (Khasi Hills).

Cirrhopetalum viridiflorum (Schltr.) Hook.f. Fl. Brit. India 5: 779. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 86. t. 118. 1898. - - Bulbophyllum viridiflorum Schltr. in Orch. 4: 108. 1910.

Pseudobulbs caespitose, ovoid, 2 cm long, 2-leaved. Leaves lanceolate, 6-10 x 2-2.5 cm, acute, base broad, sheathing, deciduous. Scapes as long as leaves, dense-flowered, decurved; bracts brown, membranous; flowering bracts ovate-lanceolate. Flowers imbricating, 2 cm long; dorsal sepals ovate-oblong, subacute laterals much shorter than dorsals;ovate-lanceolate; petals suborbicular with glandular hairs at the apex; lip longer than petals , entire; capsules 1.5 cm long, obtusely angled.

Common in dense moist forests, on tree trunks and on moss covered rocks.

Fls. & Frts. : September to October.

Specimens examined: Deka | Shillong Orchid House (ASSAM). | ~~No.~~ 9

Cleisostoma Bl.

Epiphytic orchids with long stems. Leaves coriaceous, fleshy. Flowers in racemes or in panicles. Sepals and petals subequal; lip with large funel-shaped spur; cavity of spur closed by 2 calli; sidelobes of lip minute or 0; midlobe thick, concave. Column short. Pollinia 2.

K E Y T O S P E C I E S

1a. Flowers brownish-violet; sepals and petals cuneate . . . . . paniculata

1b. Flowers yellowish-white; sepals and petals oblong . . . . . brevipes

Cleisostoma brevipes Hook.f. Fl. Brit. India 6: 73. 1890.

Stems tufted, pendulous, 20-80 cm long, leafy all over. Leaves 10-15 x 2 cm, oblong, fleshy, apex acute, base sheathing. Peduncles shorter than leaves, stout, dense-flowered; flowers yellowish-white, mottled with purple; sepals and petals subsimilar, oblong, erect, acute, 1 cm long; lip 3-lobed, sidelobes falcate, midlobe sagittate; spur short, cuneate. Capsules fusiform, terete, ribbed, 2 cm long.

Common in dense forests, on tree trunks.

Fls. & Frts. : April to July.

Specimens examined: Rao 2809 Peak forest (Khasi Hills) (ASSAM).

Cleisostoma paniculata((Ker.-Gawl.) Garay. Bot. Mus. Leafl. Harv. Univ. 23, 4: 173. 1972. - Aerides paniculata Ker-Gawl. in Bot. Reg. 3. t. 220. 1817.

Stems thick, 4-6 cm long. Leaves linear-oblong, 15-30 x 2-3 cm, apex unequally lobed. Peduncles axillary, branched, 30-40 cm long, branches up to 15 cm long, moderately dense-flowered. Flowers 1 cm across, brownish-violet; lateral sepals 1.5 mm long, cuneate, dorsal sepals 3 mm long; petals similar to sepals. Lip shorter than sepals and petals, fleshy, incurved. Spur 4 mm long. Capsules subfusiform, 1.5 cm long, usually directing downwards.

Rare, on tree trunks in forests of lower elevation.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2918 Tasak (Garo Hills).

Coelogyne Lindl.

Epiphytes. Pseudobulbs ovoid or elongated. Leaves plicate, or coriaceous. Scapes lateral or terminal on mature pseudobulbs, many-flowered,(rarely 1-2). Flowers white or creamy, greenish-yellow or brown. Sepals oblong-lanceolate to elliptic or ovate. Petals narrower than sepals filiform. Lip sessile to the base of column, concave, deeply or obscurely 3-lobed; sidelobes clasping the column; midlobe spreading or recurved; column without foot, winged. Anther 1. Pollinia 4, attached in 2 pairs to the granular caudicle. Capsules ellipsoid, ribbed.

K E Y T O S P E C I E S

1a. Flowers opening successively, rarely all at the same time.
  2a. Flowers opening simultaneously; lip with tuberculate keels . . . . . micrantha
  2b. Flowers opening successively, 1 or few at a time; lip with continuous and wavy keels not tuberculate . . . . . ovalis
1b. Flowers opening simultaneously, all at the same time.
  3a. Scapes clothed with distichous, imbricating scales or bracts.
    4a. Pseudobulbs cylindric, or narrowly ovoid; flowers brownish-yellow . . . . . longipes
    4b. Pseudobulbs broadly ovoid; flowers greenish-yellow . . . . . prolifera
  3b. Scapes naked, if clothed with bracts, bracts not distichous.
    5a. Scapes developing in between the pseudobulbs or undeveloped pseudobulbs; lowest flowering bracts naked.
      6a. Dorsal sepals larger than laterals, close to column . . . . . fuscescens
      6b. Dorsal sepals equalling to or smaller than dorsal, not close to column . . . . . flaccida

5b. Scapes otherwise; lowest flowering bracts usually clothed with scales or sterile bracts.

7a. Blotches on the lip not bordered; keels more deeply fimbriate . . . . . cristata

7b. Botches on the lip bordered; keels crenulate not fimbriate.

8a. Inflorescence terminal on the mature pseudobulb; peduncles naked, lowest bract sterile . . . . . punctulata

8b. Inflorescence lateral on mature pseudobulb; peduncles sheathed at base, lowest bracts fertile.

9a. Pseudobulbs oblong-subquadrangular; leaves oblong; raceme many-flowered . . nitida

9b. Pseudobulbs elliptic-turbinate; leaves elliptic-oblong; raceme 1-5-flowered;... ..... occultata

Coelogyne cristata Lindl. Col. Bot. sub. t. 33 (Textus). 1821; Das & Jain in Fl. India Fasc. 5, 9. 1980.

Pseudobulbs ovoid-oblong, 3-8 x 2-5 cm. Leaves subsessile, 10-30 x 1.5-3 cm. Peduncles 2-8-flowered, arched. Flowers white, fragrant, 6-9 cm across. Sepals undulate; petals as long as or shorter than sepals, undulate. Lip 3.5-4.5 cm long, white, mottled yellow, 3-lobed; midlobe rhomboid, entire; sidelobes broadly oblong, rounded; keels 5, pectinate or fimbriate. Column broadly winged. Pollinia oblong. Capsules 6-8 cm long, ellipsoid.

Common on rocks and tree trunks in forests.

Fls. & Frts. : February to June.

Specimens examined: Tura (Garo Hills), (ASSAM).

Collom & Ms

Coelogyne flaccida Lindl. Gen. Sp. Orch. 39. 1830; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 133.t. 183. 1898; Das & Jain in Fl. India Fasc. 5, 10.1980.

Pseudobulbs clustered, angular. Leaves 4-16 x 1.5-4 cm, lanceolate, base narrowered to a long petiole. Scapes 5-25 cm long, 5-12-flowered. Flowers 1.5-4.5 cm across, creamy-white. Sepals and petals subequal; lip 2 cm long, serrulate at sinus; midlobe ovate, acute, golden-yellow at base; sidelobes golden-yellow at apex with dichotomous brown streaks; keeled up to the base of the midlobe. Column 1-2 cm long, winged. Pollinia spherical. Capsules 4-5 cm long, 3-angled.

Common on tree trunks in forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 2391 Nongpoh (Khasi Hills).

Coelogyne fuscescens Lindl. Gen. Sp. Orch. 41. 1830; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 132. t. 181. 1898; Das & Jain in Fl. India Fasc. 5, 13. 1980.

Pseudobulbs cylindric or fusiform. Leaves plicate, base narrowed to a short petiole. Scapes longer than leaves, 3-8-flowered. Flowers 2-3.5 cm across, yellowish. Dorsal sepals 3-4 cm long, laterals as long as dorsals; petals equalling sepals. Lip with dark reddish-brown spots and a marginal band on the sidelobes; column winged. Capsules 6-7 cm long.

Occasional in forests.

Fls. & Frts. : August to October.

Specimens examined: Deka Umsaw (without No.) (Khasi Hills), (ASSAM).

Coelogyne longipes Lindl. Fol. Orch. Coelog. 10. 1854; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 136. t. 189. 1898; Das & Jain in Fl. India Fasc. 5, 16. 1980.

Pseudobulbs 2-10 cm long, cylindric or narrowly ovoid. Leaves 2, rarely 3. Scapes much longer than leaves, 3-6-flowered. Flowers 1-1.5 cm across, yellowish-brown; sepals subequal; petals 1 cm long; lip as long as petals, brownish-yellow; midlobe obcordate, retuse; lateral lobes obovate, rounded; keeled prominent on the epichile only. Column 7-8 mm long, winged.

Common on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2999 Mawphlang (Khasi Hills).

Coelogyne micrantha Lindl. in Gard. Chron. 173. 1855; Das & Jain in Fl. India Fasc. 5, 16. 1980.

Pseudobulbs oblong to obovoid. Leaves 5-20 x 1-2 cm, base narrowed to a short petiole. Scapes 3-9-flowered. Flowers 1.2-2 cm across, creamy. Sepals subequal, 1 cm long; petals filiform; lip as long as sepals; midlobe oblong, cuneate at base, undulate; sidelobes narrowly oblong; keels fimbriate or tuberculate; column 6-7 cm long, slightly winged. Capsules 2 cm long, ellipsoid.

Common on tree trunks and rocks in forests.

Fls. & Frts. : February to April.

Specimens examined: Myrthong 1784 Mawsmai (Khasi Hills).

Coelogyne nitida (Wall. ex Don) Lindl. Gen. Sp. Orch. 40. 1830; Das & Jain in Fl. India Fasc. 5, 19. 1980. - - Cymbidium nitidum Wall. ex Don, Prodr. Fl. Nepal. 35. 1825. - - Coelogyne ochracea Lindl. Bot. Reg. t. 69. 1846; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 132. t. 182. 1898.

Pseudobulbs oblong, subquadrangular. Leaves 6-20 x 2-4 cm, lanceolate. Scapes 4-8-flowered. Flowers 3-5 cm across; sepals subequal; petals equalling sepals; lip white, orange-red bordered, 3-lobed; midlobe ovate, recurved; sidelobes serrulate at the apex; column winged. Capsules lanceolate, obtusely ribbed.

Rare, on tree trunks and on moss covered rocks, in forest.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 3000 Mawsmai (Khasi Hills).

Coelogyne occultata Hook.f. Fl. Brit. India 5: 832. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 135. t. 186. 1898; Das & Jain in Fl. India Fasc. 5; 20. 1980.

Pseudobulbs top-shaped. Leaves 3-10 x 1-2 cm, short petioled. Racemes 1-2-flowered. Flowers 3-4 cm across. Sepals and petals subequal; lip 3-lobed, midlobe ovate, acute; sidelobes oblong, rounded; keels 3, white; column winged, streaked with yellowish-brown. Capsules ellipsoid.

Common on tree trunks and on moss covered rocks, in forests.

Fls. & Frts. : June to September.

Specimens examined: Myrthong 1777 Jowai (Jaintia Hills).

Coelogyne ovalis Lindl. Bot. Reg. 24: 91. Misc. 191. 1838; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 135. t. 187. 1898; Das & Jain in Fl. India Fasc. 5, 23. 1980.

Pseudobulbs narrowly ovoid to fusiform. Leaves subsessile, 5-20 x 2-5 cm,. Racemes 1-5-flowered. Flowers 3-5 cm across. Sepals and petals subequal, 2-3 cm long. Lip equalling sepals and petals blackish-brown, 3-lobed; midlobe ovate, fimbriate; sidelobes oblong, obtuse, slightly fimbriate; keels 2, continuous, dark brown on epichile, Column pale yellow. Capsules 3-5 cm long, 6-angled.

Common in forests.

Fls. & Frts. : January to April.

Specimens examined: Myrthong 1184 Shillong peak (Khasi Hills).

Coelogyne prolifera Lindl. Gen. Sp. Orch. 40. 1830; Das & Jain in Fl. India Fasc. 5, 23. 1980. - - C. flavida Wall. ex Lindl. Fol. Orch. Coelog. 10. 1854; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 138. t. 191. 1898.

Pseudobulbs ovoid. Leaves 10-15 x 1.5-3 cm. Racemes 5-12-flowered. Flowers 1 cm across, greenish-yellow. Sepals and petals subequal. Lip 6-8 mm long, 3-lobed; midlobe recurved ,undulate, sidelobes oblong, obtuse, clasping the column. Column 4-6 mm long, not winged. Capsules 2-4 cm long.

Common on tree trunks and rocks in forests.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 1603 Shillong peak.

Coelogyne punctulata Lindl. Col. Bot. sub. t. 33. 1821; Das & Jain in Fl. India Fasc. 5: 24. 1980.

Pseudobulbs 3-8 cm long, ovoid. Leaves 10-20 x 2-5 cm, Racemes 2-6-flowered. Flowers 3-6 cm across, white; sepals and petals subequal, 2-3 cm long; lip shorter than sepals andpetals, 3-lobed, midlobe ovate, undulate; sidelobes oblong-ovate, rounded; keels 3, extending up to the yellow blotch on midlobe, crenulate, with 2-4 additional keels on the midlobe. Column 2 cm long, winged. Capsules 3-5 cm long, ellipsoid.

Occasional in forests.

Fls. & Frts. : March to July.

Specimens examined: Deka (without No.) Nongpoh (Khasi Hills) (ASSAM).

C. corymbosa, C. raizadae, C. schultesii and C. viscosa, have also been reported by Das & Jain from Meghalaya, based on old collections prior to 1950, deposited in the herbaria of Botanical Survey of India, Shillong and Calcutta but not encountered in the present study, it is felt that these species might have disappeared from Meghalaya, due to severe discrimination of original forests.

Cryptochilus Wall.

Cryptochilus sanguinea Wall. Tent. Fl. Napal. 36. t. 26. 1826; Hook.f. Fl. Brit. India 5: 827. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 163. t. 220. 1898; Tuyama in Hara, Fl. East. Himal. 430. 1966.

Pseudobulbs elongate, tufted, ovoid to elliptic, clothed with sheaths. Leaves 5-20 x 1.5-3 cm, oblong-lanceolate, acute, base narrowed to a short petiole. Scapes longer than leaves, many, secund flowers, hairy. Flowers 1 cm across, red. Floral bracts short, lanceolate, acute, Sepals tubular, connate in a gibbous at base, free at apices; petals triangular, acute. Lip oblong, entire. Column very short, Pollinia 8. Capsules 1.5-2 cm long.

Occasional on tree trunks and moss covered rocks in forests.

Fls. & Frts. : June to August.

Specimens examined: Kataki 37238 Cherrapunjee (Khasi Hills), (ASSAM).

Cymbidium Sw.

Epiphytic or terrestrial orchids, with usually a short stem, rarely with an elongated leafy stems. Leaves linear, rarely lanceolate, ensiform, with acute or notched apex, base sheathing, conduplicate in buds. Flowers few to many, in racemes. Sepals and petals subequal, free. Lip 3-lobed, lateral lobes convolute, embracing the column; midlobe decurved. Column long, foot absent. anthers 1-celled or imperfectly 2-celled; pollinia 2, or 4, pyriform, furrowed, on a small strap-shaped gland.

K E Y T O S P E C I E S

1a. Leaves absent or rudimentary during flowering time; rootstock creeping, branched . . . . . macrorhizon

1b. Leaves prominent, persistent; rootstocks short, not creeping, if creeping not branched.

2a. Leaves elliptic-lanceolate, 5-30 cm long, tip acute, not notched.

3a. Scapes few-flowered; lip white with red-purple blotches . . . . . lancifolium

3b. Scapes many-flowered; lip purple with dark blotches . . . . . devonianum

2b. Leaves long, ensiform, apex unequally 2-lobed or acute.

4a. Epiphytic; flowers on pendulous, branched peduncles, epichile broadly oblong, as long as or shorter than hypochile . . . . aloifolium

4b. Terrrestrial; flowers simple or branched, erect; epichile otherwise equalling hypochile.

5a. Scapes robust, many-flowered; bracts small, shorter than ovary; sepals and petals oblong-lanceolate; lip hairy all over . . giganteus

5b. Scapes slender, few-flowered; bracts large, as long as or exceeding the ovary; sepals and petals linear-lanceolate; lip hairy within only. . . . . cyperifolium

Cymbidium aloifolium (Linn.) Sw. Nov. Act. Sc. Upsal. 6: 77. 1799; Hook.f. Fl. Brit. India 6: 10. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 189. t. 255. 1898.

Roots fleshy, stout. Stems short, 2-5 x 4-5 cm, pseudobulbous, clothed with leaf-fibres. Leaves 30-60 x 2-4 cm, ensiform, sheathing at base, apex unequally notched, one lobe longer and retuse. Racemes shorter than leaves, many-flowered, developing at the

base of the bulbous stems. Flowers large, 5-8 cm across, yelowish-brown, spreading. Sepals and petals lanceolate, acute; lip broader than sepals and petals, yellow. Column yellowish-purple, shorter than lip. Capsules 5 cm long, ribbed, lanceolate, contracted at both ends.

Common on tree trunks in forests of lower elavation. This species can be easily seen from a distance due to its dense leaves and tufted habit.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 2903 Agarobadha (Garo Hills); 3115 Burnihat (Khasi Hills).

Cymbidium cyperifolium Wall. ex Lindl. Gen. Sp. Orch. 163. 1833; Hook.f. Fl. Brit. India 6: 13. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 186. t. 248. 1898; Rao & Balak. in Rec. bot. Surv. India 20(2): 209. 1973.

Roots few, fleshy, undulate. Leaves distichous, overlapping at base, 4-60 x 0.8-1.5 cm, ensiform, acute at apex. Racemes few-flowered; bracts large, as long as or exceeding the ovary. Flowers 4-6 cm across, brown-violet. Sepals and petals subequal, 2 x 0.4-0.6 cm, green, obtuse. Lip broader, spotted with red or chacolate brown and hairy within. Column shorter than lip, stout, fleshy, streaked with red spots all over.

Common in deep forests as forest undergrowth, along banks of streams and rivulets.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 3094 Shillong peak.

Cymbidium devonianum Part. Mag. Bot. 10: 97. 1843; Hook.f. Fl. Brit. India 6: 10. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 190. t. 253. 1898; Tuyama in Hara, Fl. East. Himal. 430. 1966.

Stems woody, short, clothed with distichous leafsheaths. Leaves ensiform, coriaceous, 20-35 x 2-4 cm, oblong-lanceolate, acute, base narrowed to a channelled petiole. Racemes equalling leaves, dense-flowered. Flowering bracts small. Flowers 2 cm across, brownish-yellow, blotched with longitudinal streaks. Sepals subequal, oblong-lanceolate; petals as long as sepals, ovate-lanceolate. Lip reflexed, 3-lobed, sidelobes obscure, midlobe triangular, purple with dark blotches. Column sleshy, winged towards the apex. Capsules oblong, ribbed.

Occasional in forests.

Fls. & Frts. : May to June.

Specimens examined: Hynnieyta 50835 Cherrapunjee, (Khasi hills); Deka 5163 Jowai (Jaintia Hills) (ASSAM).

Cymbidium giganteum Wall. ex Hook.f. Fl. Brit. India 6: 12. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 191. t. 254. 1898.

Terrestrials or epiphytes. Stems short. Leaves 30-60 x 2.5-3 cm, linear, ensiform, apex obliquely 2-lobed, base sheathing. Scapes 20-40 cm high, clothed at base with white or straw coloured, 10-15 cm long, cymbiform sheaths, usually 6-12-flowered. Flowers 4-5 cm across, greenish-violet, or chacolate brown, pedicels 5-8 cm long, stout. Sepals and petals linear or oblong, 2.5 cm long, greenish-brown, blotched yellow within. Lip broad, shorter than

sepals and petals, densely hairy, crested or with 2 distinct hairy lamellae, obscurely 3-lobed, sidelobes obscure, midlobe large, orbicular, crenulate or wavy. Column erect, stout, 2 cm long. Pollinia 2. Capsules including pedicels 8 cm long.

Rare, along streams and rivulets on boulders and rocks.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1351 Jowai (Jaintia Hills).

Cymbidium lancifolium Hook.f. Exot. Fl. t. 51. 1823; et Fl. Brit. India 6: 9. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 185. t. 247. 1898; Rao & Balak. in Rec. bot. Surv. India 20(2): 209. 1973.

Stems slender, 4-6 cm high. Leaves lanceolate, 8-15 x 3-5 cm, acute at both ends, petioles as long as or longer than blades. Racemes few-flowered, bracts cymbiform. Sepals and petals subequal. spreading, free. Lip spotted with violet all over. Column facing the lip, shorter than lip and reflexed, spotted within all over. Capsules oblong, obtusely angled, erect.

Common as forest undergrowth, associated with ground ground floras.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1852 Upper Shillong.

Cymbidium macrorhizon Lindl. Gen. Sp. Orch. 162. 1830; Hook.f. Fl. Brit. India 6: 9. 1890.

Terrestrials. Rootstocks branched. Scapes 5-15 cm high, clothed with linear, acute sheaths. Flowers 2-3 cm across, pale brown. Bracts shorter than ovary. Sepals linear, acute; petals whitish brown, blotched with crimson bands. Lip whitish-yellow,

with deep red spots within, 3-lobed; sidelobes short, midlobe ovate, obtuse, crested within. Capsules fusiform.

Common in pine forests among pine litters. Leaves have not been observed in our specimens.

Fls. & Frts. : April to June.

Specimens examined: Jamir 6020 Shillong (NEHU).

Cyperorchis Bl.

Cyperorchis elegans (Lindl.) Bl. Rumph. 4: 47. 1836; Hook.f. Fl. Brit. India 6: 14. 1890; Rao & Balak. in Rec. bot. Surv. India 20(2): 209. 1973. - - Cymbidium elegans Lindl. Gen. Sp. Orch. 163. 1832; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 194. t. 259. 1898.

Epiphytic orchids. Stems reduced. Leaves radical, 40-60 x 1.5-3 cm, ensiform, apex acute, shortly notched. Scapes shorter than leaves. Bracts cymbiform, 2-10 cm long, straw-coloured. Racemes few to many-flowered. Flowers congested towards the apex, 3-4 x 1.5-2.5 cm, creamy. Sepals and petals linear-oblong, obtuse, concave. Lip slightly recurved. Column slender, hairy in front. Pollinia 2, pyriform. Capsules ellipsoid.

Common on tree trunks and on rocks forming clumps, in forests, it is also cultivated as pot herb for their creamy and showy flowers.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1355 Shillong peak (Khasi Hills).

Dendrobium Sw.

Epiphytic orchids with short or elongated fleshy stems. Leaves flat, not plicate. Flowers solitary or in racemes, often large and showy; sepals subequal, laterals adnate to the foot of the column and forming a sac or mentum or spur; petals usually similar to sepals; lip slightly 3-lobed, terminal lobe flat, or concave or convex; column short; foot usually with a nectar, or cavity at its extrimity. Pollinia 4, ovoid or oblong.

K E Y T O S P E C I E S

1a. Leaves equitant, laterally compressed, ovate, acute, nerveless.
  2a. Flowers terminal, more than 1 cm across; lip triangular, cuneate, truncate or 2-lobed . . *terminale*
  2b. Flowers both terminal and axillary, less than 1 cm across; lip cuneately oblong, obscurely 3-lobed . . . . . *anceps*
1b. Leaves not equitant, lanceolate, acute or notched, coriaceous, distinctly nerved.
  3a. Stems branched, pendulous, branches terminating in pseudobulbs; leaves solitary, terminal; midlobe of lip with 2 diverging lobules, crenulate and crisped . . . . . *macraei*
  3b. Stems simple, not branched, if branched without ending in pseudobulbs; leaves many, (solitary in *D. aggregatum*), lateral, or subterminal; midlobe of lip without diverging lobules.
    4a. Flowers terminal either from the base or side of the arrested uppermost internode or both terminal and lateral.
      5a. Stems slender, with dense ferruginous hairs on sheaths; flowers 2 cm across . . . . *longicornu*
      5b. Stems stout, glabrous; flowers large up to 10 cm across . . . . . *formosum*

4b. Flowers lateral, in axillary or leaf opposed racemes,or in fascicles.

6a. Stems long, slender, pendulous, branched, flowers in pairs on a short peduncle from leafless stem; petals linear, narrower than sepals; lip orbicular . . ramosum

6b. Stems variable, stout or slender, simple; flowers not paired, usually from leafy stems, rarely from leafless stems; petals broader than sepals; lip orbicular or not.

7a. Flowers solitary or 2-4, on short peduncles.

8a. Stems subclavate, suberect; flowers 1-3, on a very short peduncle from leafless stems, white or straw-coloured; spur large, conical, truncate; lip ovate, lanceolate, recurved, base with short incurved sidelobes . . . . . heterocarpum

8b. Stems slender, pendulous; flowers many on long,or short peduncle from leafless or leafy stems; spur small, acute; lip variable.

9a. Flowers pink,or white,on leafless stem; lip purple within, clawed, basal lobes recurved, pubescent . . . . . transparens

9b. Flowers white, with violet tip; lip shortly clawed, undulate; basal lobes otherwise. . . . amoenum

7b. Flowers many, 2-3-nate, rarely solitary,on short stalks.

10a. Internodes cylindric.

11a. Internodes gradually increasing towards the apex; lip with a basal pit and ridge across the claw . . . . . crepidatum

11b. Internodes not as above; lip without pit and ridge.

12a. Flowers 1-5, on a large bracteate peduncle; lip trumpet-shaped, puberulous . . lituiflorum

12b. Flowers 2-4, sub-racemose on short peduncle; lip not trumpet-shaped, glabrous. . . nobile

10b. Internodes swollen at the top.

13a. Racemes from leafy stem; lip pyriform, or hemispheric, margin inflexed . . . moschatum

13b. Racemes from leafless, or leafy stems; lip otherwise.

14a. Stems terete, throughout.

15a. Racemes many-flowered, pendulous, basal sheaths tubular; lip with 2 brown spots; margin subfimbriate. . . . . gibsonii

15b. Racemes few-flowered, erect or pendulous, basal sheaths not tubular; lip with or without brown spots, not fimbriate.

16a. Stems stout, subclavate; racemes on leafless branches; lip with a blood-red disk, base short, convolute; limb transversely oblong, pubescent, margin erose . . . . . clavatum

16b. Stems slender not subclavate; racemes on leafy stems; lip with or without a blood-red disk, base otherwise; margin revolute or everted.

17a. Flowers 2-nate, on leaf-opposed peduncle; lip with a convolute claw and concave blade, disk blood-red, margin revolute . . . . . ochreatum

17b. Flowers 2-4-nate, on short, or obscure leaf-opposed peduncle; lip otherwise, with or without blood-red disk, margin everted . . . . . .chrysanthum

14b. Stems clavate.

18a. Stems pseudobulbous, fusiform, aggregated, 1-leaved; leaf oblong, notched at the apex; flowers golden yellow . . . . . aggregatum

18b. Stems elongated, not as above; leaves many, acute, or notched; flowers variable.

19a. Stems 4-angled; flowers crowded in decurved racemes; bracts large, membranous; lip orange-yellow; funnel-shaped; spur subglobose . . , ... densiflorum

19b. Stems many-angled; flowers many or few, in erect, or pendulous racemes; bracts small; lip orbicular, pale yellow, or yellowish-green; spur rounded.

20a. Racemes short, on leafless stem; petals concave; lip ovate, hirsute, base saccate, convolute . . . . . porphyrochilum

20b. Racemes long, on leafy stem; petals not concave; lip orbicular, glabrous or fimbriate.

21a. Stems clavate; lip shortly clawed, sidelobes inflexed, margin erose . . . . . farmeri

21b. Stems subclavate; lip orbicular,not clawed, sidelobes erect, or reflexed; margin fimbriate.. .... .chrysotoxum

Dendrobium aggregatum var. jenkinsii King & Pantl. in Ann. roy. bot. Gard. Calc. 8: 60. t. 85. 1898.

Pseudobulbs aggregated, deep yellow, 4 cm long, truncate, strongly angled. Leaves solitary, on each pseudobulb, oblong, as long as pseudobulbs, shallowly notched. Peduncles 2-4 cm long, few-flowered. Bracts scale-like, 2 mm long. Pedicels 4 cm long. Flowers 2-4 cm across, orange-yellow. Sepals 1-1.5 cm long; petals slightly longer than sepals. Lip much longer and broader than sepals and petals. Capsules clavate, or oblong, ribbed.

Common on tree trunks in forests.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1546 Lailad (Khasi Hills).

Dendrobium amoenum Wall. ex Lindl. Gen. Sp. Orch. 78. 1830; Hook.f. Fl. Brit. India 5: 738. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 60.t. 85. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 184. 1971; Rao & Balak. in Rec. bot. Surv. India 20(2): 210. 1973.

Stems slender, 30-40 cm long. Leaves linear-lanceolate,

acute. Flowers pale white, or pinkish-white, 2-3, on peduncle from the leafless stems. Pedicels 2 cm long; sepals 2-2.5 cm long, oblong, obtuse; petals larger than sepals, ovate. Lip shortly clawed, produced at the base to a short spur, with violet stripes within. Capsules cuneate, angled.

Common on trees, in secondary forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 1548 Lailad.(Khasi Hills).

Dendrobium anceps Sw. in Act. Holm. 246. 1800; Hook.f. Fl. Brit. India 5: 724. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 41. t. 54. 1898; Tuyama in Hara, Fl. East. Himal.

Stems tufted, 20-40 cm long. Leaves equitant, distichous, ovate-lanceolate, laterally compressed, acute, 4-6 x 2-2.5 cm, sheathing at base. Flowers axillary and terminal, short pedicelled, greenish-yellow, 1 cm across. Sepals and petals subequal. Lip oblong, obscurely 3-lobed, crenulate. Capsules oblong, or ovate, 1-1.5 cm long.

Common on trees, in dense forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2971 Jowai (Jaintia Hills).

Dendrobium chrysanthum Wall. in Lindl. Gen. Sp. Orch. 80. 1830; Hook.f. Fl. Brit. India 5: 747. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 55. t. 77. 1898; Rao & Balak. in Rec. bot. Surv. India 20(2): 20. 1973; Tuyama in Hara, Fl. East. Himal. 3 Rep. 140. 1975.

Stems 0.5-1.5 m long, erect, or pendulous, internodes 3-4 cm long, completely embraced by close sheaths. Leaves sessile, 10-20 x 3-5 cm, lanceolate, acute, many-nerved. Flowers 2-4-nate. Pedicels 5-6 cm long. Sepals orbicular, orange-yellow, 1-2 cm across. Petals fimbriate, crested. Lip clawed, orbicular, with red spots within, base cuneate, margin ciliate, or fimbriate. Column fleshy, 2 cm long, concave. Pollinia 2. Capsules 4-5 x 2 cm.

Common on trees and on moss covered rocks in forests.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 3065 Lailad (Khasi Hills).

Dendrobium chrysotoxum Lindl. in Bot. Reg. 1847. 1847; Hook.f. Fl. Brit. India 5: 750. 1890.

Stems clavate, shortly jointed, usually falcate, narrowed to the apex. Leaves alternate, jointed at base with broad amplexicual sheaths, blades ovate-lanceolate, 5-nerved, 4-6 x 2-3 cm. Flowers solitary, 3-4 cm across, orange-yellow. Sepals subequal, dorsal sepal shorter, ovate, cuneate, acute, 5-7-nerved. Petals obliquely ovate, subclavate, slightly narrowed at base. Lip elliptic, margin crenate, spotted with maroon within. Capsules 4 cm long, obtusely angled.

Occasional on trees and moss covered rocks in forests.

Fls. & Frts. : May to July.

Specimens examined: Deka (without No.) Orchidarium, Botanical Survey of India, Shillong.

Dendrobium clavatum Wall. ex Hook.f. Fl. Brit. India 5: 746. 1890.

Stems clavate, stout, 10-15 cm high. Leaves lanceolate, obtuse, 5-10 x 2-3 cm. Racemes short, few-flowered, on leafless stems. Flowers yellow, 5-6 cm across. Sepals and petals subequal. Lip orbicular, with pale blood-red disk within. Capsules 4 cm long, 3-6-angled.

Common on trees in forests.

Fls. & Frts. : March to June.

Specimens examined: Deka 23564 Umsaw (Khasi Hills),(ASSAM).

Dendrobium crepidatum Lindl. in Part. Fl. Gard. 1: 63. t. 45. 1850; Hook.f. Fl. Brit. India 5: 740. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc.8: 48. t. 66. 1898.

Stems 8-20 cm long, thickened towards the apex. Leaves 5-10 x 0.5-2 cm, sheathing, oblong-lanceolate, acute. Flowers in pairs from the apical,arrested internode. Sepals 1.5 cm long, oblong, obtuse. Petals as long as sepals. Lip slightly longer than sepals and petals oblong-orbicular, clawed, entire. Capsules 5-6 cm long, ribbed.

Occasional on trees in forests.

Fls. & Frts. : March to August.

Specimens examined: Deka Pynursla (without No.) (Khasi Hills), (ASSAM).

Dendrobium densiflorum Wall. ex Lindl. in Wall. Pl. As. 1: 34. t. 40. 1830; Hook.f. Fl. Brit. India 5: 748. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 56. t. 79. 1898; Rao & Balak. in Rec. bot. Surv. India 20(2): 210. 1973.

Stems clavate, distinctly 4-angled, or sometimes terete, yellow, internodes shorter towards the apex. Leaves subterminal, 10-15 x 5-6 cm, ovate-lanceolate, many-nerved, sheathing. Flowers 4-5 cm across, yellow, crowded in pendulous racemes. Sepals orbicular or oblong, obtuse, 2-2.5 x 1-1.8 cm; petals slightly broader than sepals. Lip large, funnel-shaped, fimbriate, with violet or blackish-brown spots on the inner face. Column fleshy. Capsules 2-3 cm, long, ribbed.

Common on rocks and tree trunks in forests, conspicuous when in flowers.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1771 Shillong, 2969 Sohkha (Jaintia Hills).

Dendrobium falmeri Part. Mag. 15: 241. 18?; Hook.f. Fl. Brit. India 5: 750. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 57. t. 80. 1898.

Stems clusted, 10-20 cm high, clavate, 4-5-angled. Leaves few, subterminal, elliptic or oblong, 6-10 x 2-4 cm. Flowers in lateral, pendulous racemes, golden yellow, 4-5 cm across. Sepals ovate-oblong; petals broader than sepals, greenish or golden yellow. Lip orbicular, obscurely 3-lobed, sidelobes inflexed, hairy; midlobe crenulate with erose margin. Capsules 4-6 cm long, obtusely angled.

Common on tree trunks in forests.

Fls. & Frts. : March to June.

Specimens examined: Deka 27532 Mawsmai (Khasi Hills), (ASSAM).

Dendrobium formosum Roxb. in Wall. Pl. As. Rar. 1(2): 34. t. 29. 1830; Hook.f. Fl. Brit. India 5: 721. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 47. t. 65. 1898.

Stems tufted, stout, 15-30 x 1-3 cm, narrowed at both ends with distinct longitudinal furrows and ridges; internodes clothed with obscure leaf-sheaths. Leaves oblong-lanceolate, coriaceous, 5-10 x 2-3 cm, unequally lobed, base sheathing, Flowers terminal, few, large, 10-15 cm across, white. Bracts ovate, 1 cm long, acute. Pedicels with ovaries 5 cm long, expanded upwards. Sepals 3, dorsal sepals ovate-lanceolate, 5 x 2 cm, acute, keeled, lateral sepals 6 x 2 cm, connate at base into a short spur . Spur conical, 2-5 cm long. Petals suborbicular, apiculate with 1 shallow longitudinal line at the back. Lip retuse, golden yellow within, sidelobes obscure. Column concave, 1 cm across. Pollinia 2, 4 mm long. Capsules 10 cm long.

Common on tree trunks in forests.

Fls. & Frts. : May to August.

Specimens examined: Myrthong 2961 Sohpetbneng forest (Khasi Hills).

Dendrobium gibsonii Lindl. in Part. Mag. 5: 169.18 et Fl. Gard. 2: 133. t. 204.18 ; Hook.f. Fl. Brit. India 5: 746. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 58. t. 81. 1898.

Stems slender, 30-60 cm long, shortly jointed, embraced by clavate sheaths. Leaves lanceolate, 10-15 x 3-4 cm, many-nerved, acute, base sheathing. Racemes many-flowered. Flowers yellow. Sepals rounded. Petals broader, entire. Lip orbicular, obtuse, blotched with 2 brown spots within, margin fimbriate. Column short. Capsules clavate or oblong, bluntly ribbed.

Common on tree trunks in evergreen forests.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1944 Way to Tura peak (Garo Hills).

Dendrobium heterocarpum Wall. ex Lindl. Gen. Sp. Orch. 78. 1830; Hook.f. Fl. Brit. India 5: 737. 1890; King et Pantl. in Ann. roy. Bot. Gard. Calc. 8: 53. t. 74. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 185. 1971.

Stems elongate, clavate upwards, 20-40 cm long, stout, erect, clothed with membranous sheaths at nodes. Leaves 10-15 x 1-2 cm, elliptic, acute. Peduncles few-flowered, on leafless stems, flowers 4 cm across. Sepals subequal, dorsal sepals linear, laterals lanceolate. Petals as long as dorsal sepals. Lip longer than sepals, orbicular, margin crenulate, disk hairy. Column short, crested within. Capsules 3-4 cm long, ribbed.

Occasional on tree trunks in forests.

Fls. & Frts. : February to April.

Specimens examined: Hynniewta 51883 Cherrapunjee (Khasi Hills), (ASSAM).

Dendrobium lituiflorum Lindl. in Gard. Chron. 372. 1856; Hook.f. Fl. Brit. India 5: 740. 1890;

Stems slender, tufted, 20-40 cm long. Leaves oblong-lanceolate, 10 x 3 cm, acute, base narrowed to a sheathing petiole. Flowers 1-5-nate, on short peduncle, clothed with 2, large scarious bracts. Bracts 2-3 x 0.5-1 cm, persistent. Pedicels 2-3 cm long, twisted. Flowers 4 cm across, pinkish. Sepals 3 cm long, cuneate, acute, 7-nerved, base saccate. Petals as long as or longer than sepals. Lip 2 cm across, truncate, or slightly retuse, margin crenulate, white above and reddish-pink towards the base. Capsules 4-5 cm long, obtusely ribbed.

Occasional on tree trunks in forests.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 1602 Jowai (Jaintia Hills).

Dendrobium longicornu Lindl. Gen. Sp. Orch. 80. 1830; Hook.f. Fl. Brit. India 5: 720. 1890; King et Pantl. in Ann. Roy. Bot. Gard. Calc. 8: 46. t. 64. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 185. 1971; Rao & Balak. in Rec. Bot. Surv. India 20(2): 211. 1973. (Plate 102).

Stems 20-30 cm long, sometimes undulate, internodes 3-4 cm long, clothed with compressed, hirsute sheaths. Leaves sessile, lanceolate, 5-8 x 0.8-1.2 cm, 3-nerved, apex unequally 2-lobed, 1 lobe ending a few milimeters below the longer lobe; lower leaves deciduous with age. Flowers white, bracteoles 1-1.2 cm long. Pedicels 3-4 cm long. Sepals 2 cm long, lateral sepals connate at base froming a long spur, as long as sepals, cuneate. Petals similar to sepals. Lip broad, oblong, shorter than sepals, 1.5-2 cm

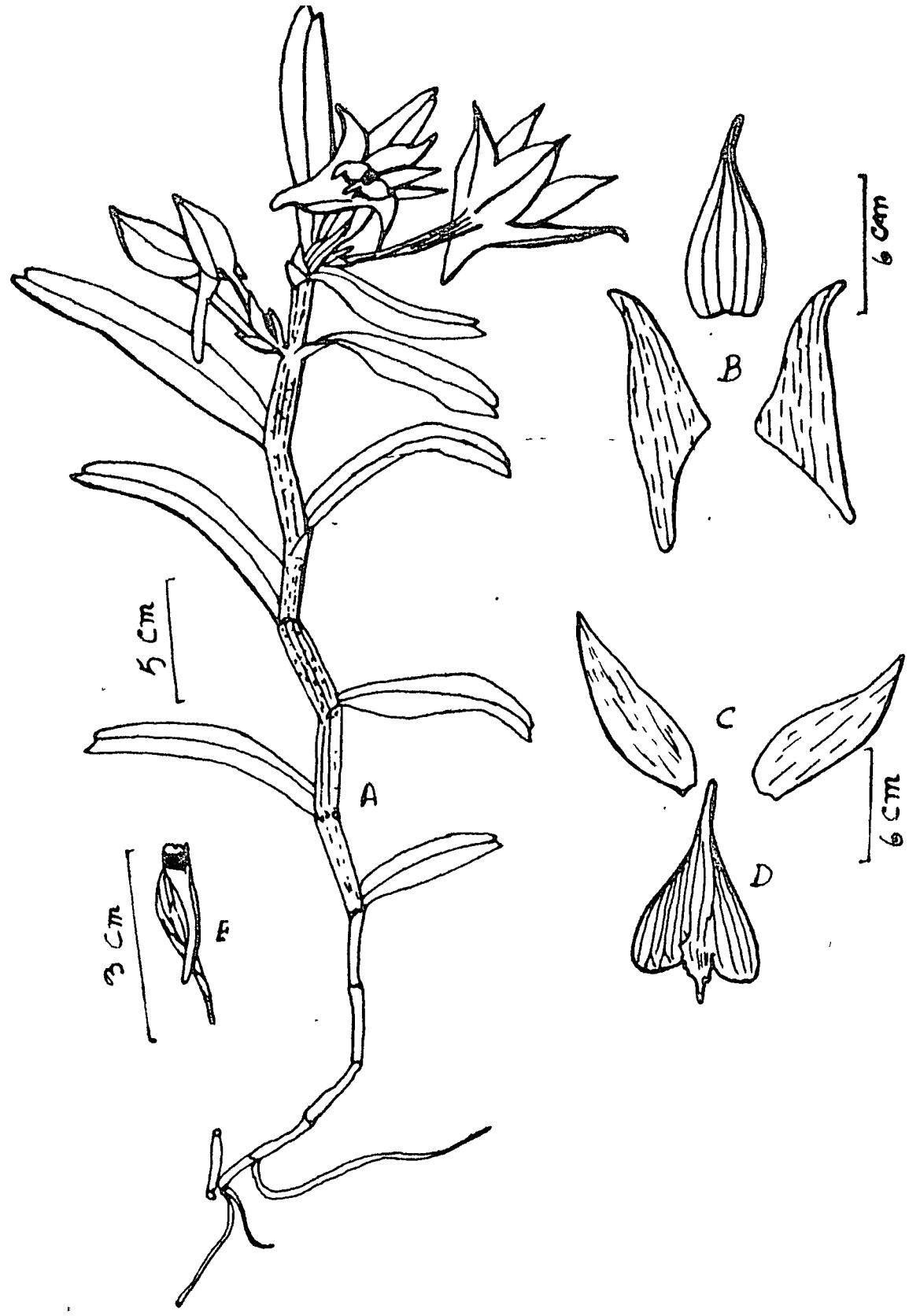

Plate 102 Dendrobium longicornu Lindl., A. Habit, B. Sepals, C. Petals, D. Labellum, E. Column and Spur.

across; column facing the lip, fleshy, tinged with yellow. Capsules oblong, 2 cm long.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1331 Shillong peak (Khasi Hills).

Dendrobium macraei Lindl. Gen. Sp. Orch. 73. 1830; Hook. f. Fl. Brit. India 5: 714. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 61. t. 86. 1898; Tuyama in Hara, Fl. East. Himal. 432. 1966.

Stems jointed, branched above, each branch ending in pseudobulb. Leaves linear-lanceolate, 15-20 x 2-4 cm, acute. Peduncles 2-3-flowered. Flowers yellow. Sepals and petals sub-equal, linear-lanceolate. Lip 3-lobed, sidelobes oblong, obtuse; midlobe incurved, crenulate. Capsules 2 cm long.

Common on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2915 Lailad (Khasi Hills).

Dendrobium moschatum Wall. ex D. Don Prodr. Fl. Nepal. 34. 1825; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 60. t. 84. 1898.

Stems 1-2 m high, erect, internodes gradually shorter from base to apex. Leaves ovate-lanceolate, acute, many-nerved, 6-10 x 2-4 cm, subsessile. Peduncles 4 cm long, leaf-opposed,

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2-3-flowered, clothed at base with small, membranous sheaths. Flowers 4-8 cm across, yellow or creamy yellow. Sepals oblong, 1.5-2 cm across, reticulate. Petals 3 cm across. Lip hemispheric, margin fimbriate. Capsules oblong, fusiform, up to 8 cm long.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1650 Jowai (Jaintia Hills).

Dendrobium nobile Lindl. Gen. Sp. Orch. 79. 1830; Hook.f. Fl. Brit. India 5: 740. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 51. t. 71. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 185. 1971.

Stems stout, pendulous or erect, tufted, clothed with thin, white, membranous sheaths. Leaves lanceolate, 5-8 x 2-4 cm, acute, Peduncles short, few-flowered, on leafless stems. Flowers purple, 3.5-4 cm across, long pedicelled. Sepals linear-oblong. Petals as long as sepals but broader. Lip ovate, hairy, with incurved margin, obscurely 3-lobed, sidelobes short, midlobe large, orbicular. Column falcate, stout, fleshy. Capsules clavate, ribbed, 3-6 cm long.

Common on tree trunks and moss covered rocks. One of the beautiful orchids in the state which is indiscriminately collected from wild growth and cultivated. Also sold to tourists and visitors by villagers.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 3131 Shillong.

Dendrobium ochreatum Lindl. (in Wall. Cat. 7410. 1831) Bot. Reg. t. 1765. 1842; Hook.f. Fl. Brit. India 5: 747. 1890.

Stems 10-20 cm long, shortly jointed, pendulous or erect, completely clothed with sheaths, older stems naked, contracted at the middle of the internodes, with distinct marks of fallen branches or peduncles. Leaves ovate-lanceolate, variable, 5-8 x 2-4 cm, acute. Flowers 2-nate, on common peduncle, opposite to the leaf-base. Peduncles short, clothed by bracts. Pedicels 4-5 cm long, bending towards the spur. Sepals 2 cm long, cuneate, slightly united at base forming a saccate base. Petals broader than sepals, deep yellow. Lip orbicular, 2 cm across, distinctly clawed, pubescent with erose margin and brown within. Capsules oblong, 4-6 cm long, ribbed.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : April to June.

Specimens examined: Myrthong 1697 Jowai (Jaintia Hills).

Dendrobium porphyrochilum Lindl. in Journ. Linn. Soc. 3: 18. 1859; Hook.f. Fl. Brit. India 5: 716. 1890; King et Pantl. in Ann. Roy. Bot. Gard. Calc. 8: 44. t. 59. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep., 141. 1975.

Stems short, pseudobulb-like, 2-4 cm long, clothed with membranous white sheaths. Leaves 4-8 x 4 cm, ovate, apex shallowly notched. Peduncles 2-4 cm long, few-flowered. Flowers purplish-white, Sepals 8 mm long, lanceolate, acute. Petals yellowish-green, Lip ovate, acute, spurred at base, purplish-yellow. Capsules oblong, obtusely ribbed,

Occasional on tree trunks in forests.

Fls. & Frts. : April to July.

Specimens examined: Kataki 37225 Dympep (Khasi Hills) (ASSAM).

Dendrobium ramosum Lindl. (in Wall. Cat.2003. 1831) Gen. Sp. Orch. 82. 1830; Hook.f. Fl. Brit. India 5: 736, 1890.

Stems slender, pendulous, 40-60 cm long, internodes 1.5-3 cm long. Leaves linear-lanceolate, 15-10 x 1-1.5 cm, acute, many-nerved, sessile, sheathing at base. Flowers 2-nate, on short peduncles in leafless stems. Pedicels 2 cm long. Flowers 2.5-3 cm across, greenish-yellow. Sepals 2 cm long, lanceolate, acuminate, many-nerved. Petals broader than sepals. Lip subcordate, 3-lobed, sidelobes long, rounded, midlobe orbicular, crenulate. Capsules 4 cm long, ovate-lanceolate or subfusiform.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 1780 Pariong (Khasi Hills).

Dendrobium terminale Par. et Reichb.f. in Trans. Linn. Soc. 30: 149. 1859; Hook.f. Fl. Brit. India 5: 725. 1890.

Stems tufted, usually curved at the base, 5-30 cm long, leafy all over. Leaves distichous, laterally compressed, equitant, 2-6 x 2-4 cm, acute. Flowers terminal, white, 6-8 mm across. Sepals and petals subequal. Lip cuneate, truncate, notched at the apex. Capsules 1 cm long, ribbed.

Common on trees in both evergreen and deciduous forests, specieally in lower elevation.

Fls. & Frts. : March to June.

Specimens examined: Myrthong 3097 Lailad (Khasi Hills).

Dendrobium transparens Wall. ex Lindl. Gen. Sp. Orch. 79. 1830; Hook.f. Fl. Brit. India 5: 738. 1890; King et Pantl. in Ann. Roy. Bot. Gard. Calc. 8: 50. t. 70. 1898.

Stems covered with thin membranous scales, tufted, swollen at the nodes. Flowers whitish-pink, 2-nate, on short peduncles, Sepals subequal, dorsal sepal-free, lateral sepals 2-5 cm long, cuneate, connate at base into a short spur. Petals 2, opposite the lip, spathulate, as long as or slightly longer than sepals, reflexed at the apex, deep violet within, softly hairy, shortly clawed. Column 1 cm long, concave. Capsules 3-4 cm long, ribbed.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 2962 Shillong (Khasi Hills).

Diplomeris D. Don.

Diplomeris pulchella D. Don Prodr. Fl. Nepal. 26. 1825; Lindl. Gen. Sp. Orch. 330. 1835; Hook.f. Fl. Brit. India 6: 167. 1890; Seidenfad. in Dansk Bot. Ark. 31(3): 138. t. 88. 1977.

Stems 10-20 cm high, leafy. Leaves linear, as long as stem, 5-8 mm across, subulate. Flowers solitary, terminal, yellow, 2 cm across. Bracts ovate, acute. Sepals 1 cm long, ovate-

acute. Petals obovate, acute, broader than sepals. Lip suborbicular, shortly clawed, entire. Column fleshy, half as long as lip. Spur clavate, longer than the flower, recurved.

Rare, on old road cutting and on rocks in secondary forests, specially in rocky areas.

Fls. & Frts. : August to September.

Specimens examined: Deb 28728 Mawsmai (Khasi Hills), (ASSAM).

Doritis Lindl.

Doritis taenialis Benth. in Gen. Plant. 3: 574. 1883; Hook.f. Fl. Brit. India 6: 31. 1890; King et Pantl. in Ann. Roy. Bot. Gard. Calc. 8: 199. t. 266. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 185. 1971.

Roots flat, very long, straight or undulate, clasping the tree trunks, sometimes up to 1 m long, 4-6 mm across, with 1 distinct nerve, green or straw coloured. Leaves few, usually deciduous, 4-8 x 1-1.2 cm, oblong-lanceolate, obtuse or subacute, base narrowed to a sessile or flat sheathing petiole. Peduncles as long as leaves, few-flowered. Bracts minute. Pedicels 1.5-2 cm long. Flowers 1.6 cm across, pale pink; sepals spreading, up to 6 mm long. Petals as long as sepals. Lip clawed, connate at base to the column, 3-lobed, sidelobes erect, midlobe free, very short. Capsules excluding the pedicels, 4-5 cm long, fusiform.

Common on tree trunks, clasping firmly on the barks of host plants. The roots of this species are very conspicuous and look like tape worms.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3063 Shillong peak.

Epigeneium Gagnep.

Epigeneium amplum (Lindl.) Summerh. in Kew Bull. 1957(2): 260. 1957. - - Dendrobium amplum Lindl. Gen. Sp. Orch. 74. 1830; Hook.f. Fl. Brit. India 5: 711. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 63. t. 89. 1898; Tuyama in Hara Fl. East. Himal. 431. 1966.

Rhizomes prostrate, woody, clothed with dry sheaths, all over, usually brown, with thick roots at each node. Pseudobulbs obconic, deep yellow, longitudinally wrinkled when dry. Leaves 10-15 x 3-5 cm, ovate-lanceolate, narrowed to a broad petiole, apex subacute, or sometimes with a very shallow notch. Peduncle developing in between the 2 leaves, 3 cm long, embraced by 2 large straw, cymbiform, persistent bracts. Flowers 4-5 cm across, white, or violet green. Sepals 2-2.5 cm long, lanceolate, acute. Petals similar to sepals. Lip 3-lobed, sidelobes rounded, obscure, midlobe acute, crenulate, crested between the sidelobes. Capsules 5-6 cm long, oblong, truncate.

Common on moss covered rocks and on tree trunks, in forests.

Fls. & Frts. October to January.

Specimens examined: Myrthong 3093 Shillong peak.

Epipogium R. Br.

Epipogium roseum (D. Don) Lindl. Gen. et Sp. Orch. Pl. 177. 1857. - Limodorum roseum D. Don Prodr. Fl. Nepal. 30. 1825. - - Epipogium nutans Reichb. f. in Bonpland. 5: 36. 1836; Hook.f. Fl. Brit. India 6: 124. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 252. 335. 1898.

Terrestrial, leafless, saprophytic orchids. Roots tuberous, fleshy. Scapes with racemes 20-40 cm high, pale brown or white, with few sheaths. Racemes lax-flowered. Flowering bracts lanceolate, 2 cm long, acute. Pedicels 5-8 mm long, slender. Flowers 1.2 cm across, pale white. Sepals connate at base, lanceolate, dorsal linear, falcate. Petals broader than sepals. Lip as long as sepals and petals, entire, Spur clavate, shorter than ovary. Capsules spherical, 6-8 mm long.

Rare, in bamboo forests of lower elevations.

Fls. & Frts. : March to April.

Specimens examined: Haridasan 5281 Nongpoh (Khasi Hills), (NEHU).

Eria Lindl.

Epiphytic with distinct pseudobulbs, pseudobulbs sometimes elongate, stem-like. Leaves terminal on pseudobulbs. Flowers small, in spikes or racemes, or on 2-flowered peduncles. Sepals and petals subsimilar, sepals adnate to the base of elongated

foot of the column, forming a short or long spur or mentum. Petals similar to sepals. Lip sessile. Column short or long, curved. Anthers 4 or 8-celled. Pollinia 8, waxy.

KEY TO SPECIES

1a. Flowers large, up to 2 cm across, usually white, with bright red or yellow lip . . . . . coronaria

1b. Flowers small, less than 1.5 cm across, colour otherwise.

2a. Stems slender, terete, pendulous; flowers woolly, in spikes or racemes, usually branched fascicles . . . . . paniculata

2b. Stems otherwise, erect; flowers glabrous or woolly, in spikes or racemes.

3a. Pseudobulbs ovoid or depressed; leaves membranous . . . . . muscicola

3b. Pseudobulbs oblong, elongated, or articulated, not depressed.

4a. Pseudobulbs on creeping rhizomes, elongate, cylindric; flowers minute, woolly, in secund spikes . . . . . stricta

4b. Pseudobulbs crowded or distant on creeping rhizomes; flowers larger than above, if minute not secund.

5a. Leaves 4-6, plicate; spikes 1-3, at the axil of leaves or on side of stem-like pseudobulbs; flowers minute, dense; lip truncate or crenate with broad triangular, warted tip . . . . . spicata

5b. Leaves less than 4, if more, coriaceous not plicate; spikes 1, at the apex of the pseudobulbs or on the side of the stem-like pseudobulbs; lip acute, not crenate, tip not warted.

6a. Pseudobulbs hairy, clavate, or broadly subovate . . . . . flava

6b. Pseudobulbs glabrous, elongate, cylindric or slightly compressed, stem-like.

7a. Rhizomes stout, branched; leaves coriaceous, nerveless . . . . . ferruginea

7b. Rhizomes slender or absent, not branched; leaves subplicate, with distinct nerves.

8a. Flowers sessile or subsessile.

9a. Leaves up to 30 cm long; scapes much longer than leaves; bracts up to 2 cm long, longer than flowers; lip semilunar with a short, rough midlobe in the sinus and 3 ridges in the axis . . . . . elata

9b. Leaves shorter than above; scapes shorter, or longer than leaves; bracts shorter than flowers; lip otherwise.

10a. Spikes long, woolly, drooping; lip crenulate with ridges from base to the tip, sidelobes auriculate . . . . . fragrans

10b. Spikes glabrous, erect; lip otherwise.

11a. Ovary pubescent, sidelobes of lip oblong, recurved, midlobe orbicular . . graminifolia

11b. Ovary glabrous; sidelobes of lip broad, straight, midlobe otherwise.

12a. Spur absent, foot deeply excavated . . . . . excavata

12b. Spur present, foot not excavated.. alba

8b. Flowers pedicelled.

13a. Bracts large, lanceolate or ovate-oblong; pseudobulbs 2-4-nodal, elongate, cylindric, stem-like; flowers few to many, sidelobes of lip incurved . . . . . confusa

13b. Bracts small, narrow; pseudobulbs not noaded; flowers 2, sidelobes of lip not incurved . . . . . biflora

Eria alba Lindl. Gen. Sp. Orch. 67. 1830; Hook.f. Fl. Brit. India 5: 795. 1890:

Pseudobulbs conic, or elongate, clothed with sheaths. Leaves 4-5, crowded near the apex, 10-25 x 2-3 cm, plicate, acute. Scapes longer than leaves, few-flowered. Flowers 1-1.5 cm across. Sepals 1 cm long, lanceolate, 3-5-nerved; petals 3-nerved, oblong, acute. Lip orbicular, yellow, clawed, 3-lobed, sidelobes obtuse near the base of the midlobe. Column short, erect. Capsules oblong, truncate.

Rare, on tree trunks in forests.

Fls. & Frts. : March to June.

Specimens examined Mann 19810 Shillong peak (ASSAM).

Eria biflora Griff. Notul. 3: 302. 1851; Hook.f. Fl. Brit. India 5: 800. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 117. t. 160. 1898.

Pseudobulbs tufted, stem-like, 5-8 cm long, slender. Leaves terminal, 4-5, 5-10 x 0.6-1.5 cm, linear, acute, sessile, narrowed at base. Peduncles leaf-opposed, 1-2-flowered. Flowers 3-4 mm across. Sepals subequal, dorsal elliptic, recurved, laterals falcate, petals as long as dorsal sepals. Lip oblong, incurved, 3-lobed, sidelobes emarginate, midlobe reflexed, rounded. Capsules 1 cm long, ribbed.

Rare, on tree trunks in forests.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 2998 Shillong peak.

Eria confusa Hook.f. Icon. Pl. t. 1850. 1889; et Fl. Brit. India 5: 796. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 122. t. 168. 1898.

Pseudobulbs clustered, elongate, stem-like, longer than leaves, joints clothed with membranous sheaths. Leaves subterminal, 5-10 x 1 cm, obtuse or subacute. Flowers dense in short peduncles, at the axil of leaves, pinkish-white, shortly pedicelled, 1 cm across. Sepals and petals obtuse. Lip reflexed, broader than sepals and petals, with faint pink nerves within. Capsules 1.5 cm long, obtusely ribbed.

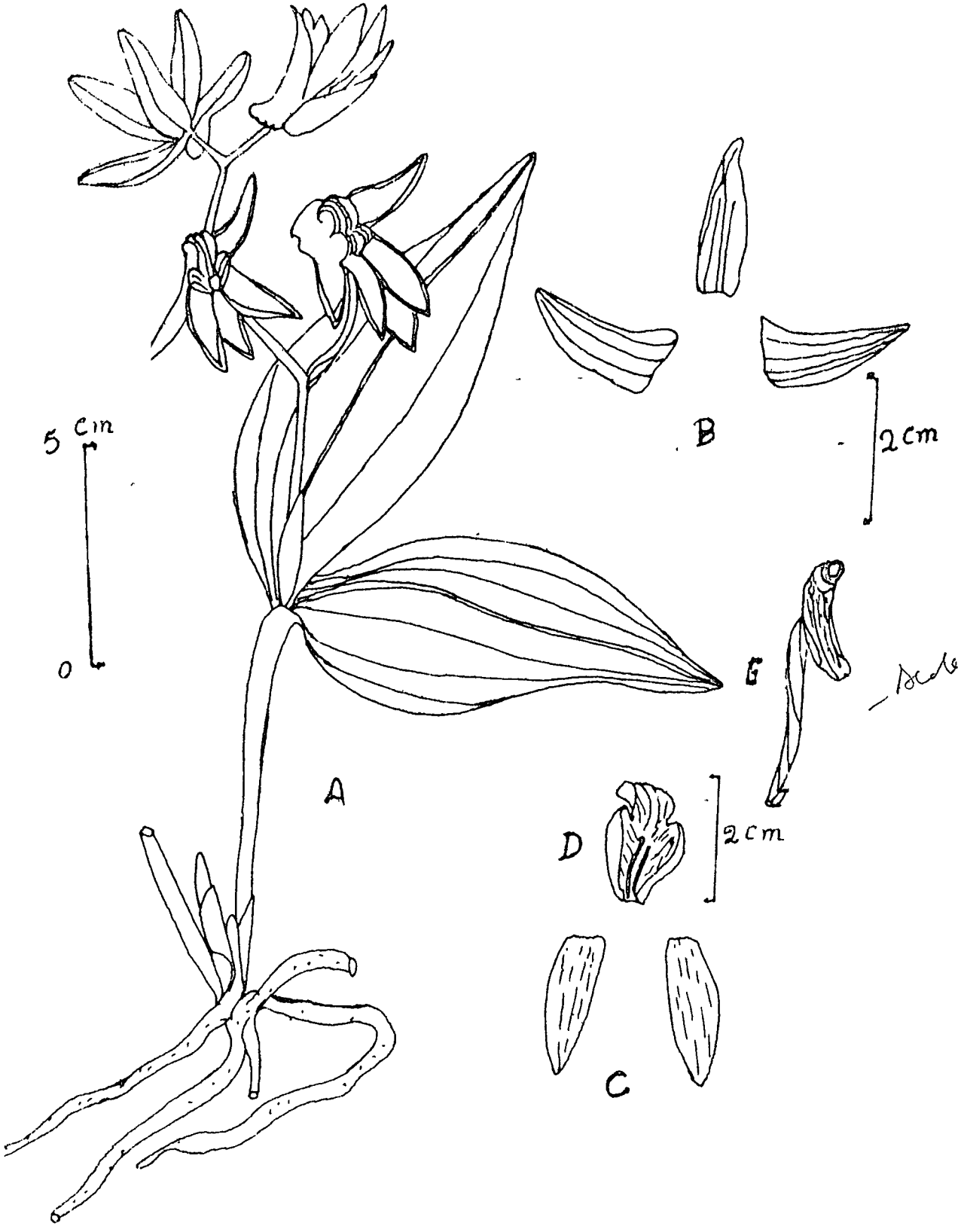
Ocassional on tree trunks in forests. This species closely resembles E. biflora in vegetative condition but can be separated from the latter in having many, dense flowers in spike.

Fls. & Frts. : October to November.

Specimens examined: Joseph 37489 Nongpoh (Khasi Hills); Balakrishnan 50239 Jarain (Jaintia Hills), (ASSAM).

Eria coronaria (Lindl.) Reichb. f. in Walp. Ann. 6: 272. 1865; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 124. t. 192. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 186. 1971. - - Trichosma suavis Lindl. Bot. Reg. 83. 1841; Hook.f. Fl. Brit. India 5: 827, 1890 (Plate 103).

Roots numerous, thick, 5 mm across, clothed with dense hairs. Stems 10-20 cm long. Leaves usually 2, 10-15 x 2-4 cm, lanceolate, turning black when dry. Racemes few-flowered. Flowers white, 3 cm across. Sepals 2 cm long, cuneate, white; petals similar to sepals. Lip sessile, oblong, tinged with yellow and brown within. Capsules



103 Eria coronaria Reichb.f. A. Habit, B. Sepals, C Petals, D. Labellum, E. Column and spur.

2 cm long, lanceolate, winged, ribbed.

Common on both tree trunks and on moss covered rocks.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1322 Shillong peak.

Eria excavata Lindl. ex Hook.f. Icon. Pl. t. 1846. 1889; et Fl. Brit. India 5: 795. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 124. t. 171. 1898; Tuyama in Hara, Fl. East. Himal. 434. 1966.

Pseudobulbs 1-6 cm long, obconic, secund, distantly placed or congested, irregularly wrinkled when dry. Leaves 4-6, plicate, 5-20 x 2-4 cm, lanceolate, acuminate, narrowed into a sheathing, flat petiole. Racemes 4-10 cm long, axis pubescent. Flowers 1 cm across. Sepals 6 mm long; petals equalling sepals, but broader. Lip shorter than sepals, ridged. Capsules 1-2 cm long, cylindric, apex truncate.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts.: September to December.

Specimens examined: Myrthong 3035 Nongpoh (Khasi Hills).

Eria ferruginea Lindl. in Bot. Reg. 1839. t. 35. 1839; et in Journ. Linn. Soc. 3: 57. 1859; Hook.f. Fl. Brit. India 5: 804. 1890.

Rhizomes thick, 6-8 mm across. Stems branched, stems short, 2-leaved. Leaves 15-20 x 2-4 cm, lanceolate, coriaceous, narrowed to a petiole, apex apiculate. Racemes 10-20 cm long, few-flowered. Flowers 2 cm across, white. Sepals 1 cm long. Petals as long as sepals but broader, obovate, oblong, Lip broader than

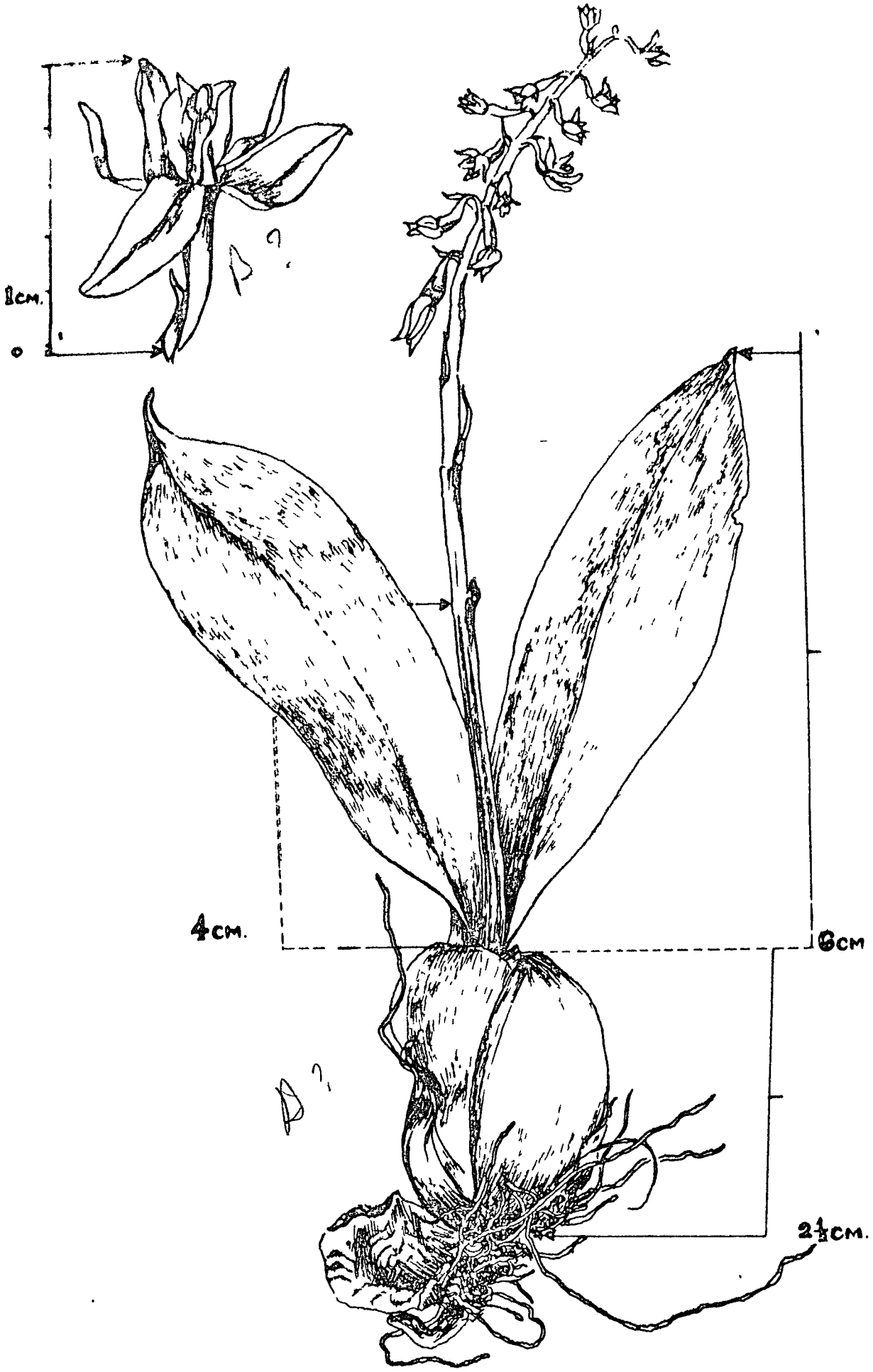


Plate 104 Eria flava lindl. A.Habit, B.Flower.

rounded at the apex. Capsules 6 cm long, ribbed, narrowed into pedicels.

Common on rocks and tree trunks in forests. Leaves appear to be crowded due to short branches.

Fls. & Frts. : October to December.

Specimens examined: Myrthong 1395 Mawsmai (Khasi Hills).

Eria flava Lindl. Gen. Sp. Orch. 65. 1830; Hook.f. Fl. Brit. India 5: 801. 1890; Tuyama in Hara, Fl. East. Himal. 434. 1966.

Pseudobulbs elongate, 6-20 cm long. Leaves 20-30 x 4 cm, lanceolate, glaucous, acute, base narrowed to a petiole. Scapes as long as leaves, stout, few-flowered. Sepals 1 cm long, ovate, obtuse. Petals obtuse, similar to sepals. Lip clawed, much broader than sepals and petals , purplish within. Column thick. Capsules 2-3 cm long.

Occasional in forests on tree trunks.

Fls. & Frts. : March to May.

Specimens examined: Deka 2287 Nongpoh (Khasi Hills); (ASSAM).

Eria fragrans Reichb.f. in Bot. Zeitg. 415. 1864; Hook.f. Fl. Brit. India 5: 794. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 122. t. 168. 1898.

Pseudobulbs 5-6 cm long, cylindric, clothed with fibrous sheaths. Leaves linear-lanceolate, 20-25 x 3-4 cm, acute, base sheathing. Scapes longer than leaves, dense-flowered, hairy. Bracts erect, white, as long as ovary. Flowers white. Sepals 2 cm long.

Rare, on tree trunks in forests.

Fls. & Frts. : March to July.

Specimens examined: Joseph 37459 Nongpoh (Khasi Hills), (ASSAM).

Eria graminifolia Lindl. in Journ. Linn. Soc. 3: 54. 1859; Hook.f. Fl. Brit. India 5: 794. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 119. t. 164. 1898; Tuyama in Hara, Fl. East. Himal. 434. 1966.

Pseudobulbs elongate, cylindric, 5-15 cm long. Leaves subterminal, 15-20 x 2-5 cm, oblong-lanceolate, acute, base narrowed to a fleshy petiole. Spikes shorter than leaves. Flowers white, 2-3 cm across. Sepals 1.5 cm long, linear-lanceolate, acute, 3-nerved. Petals similar to sepals. Lip 3-lobed, sidelobes recurved, auriculate, midlobe orbicular, entire with crests or lamellae in between the sidelobes. Column stout, erect, recurved, clavate, channelled within. Capsules oblong or subclavate.

Rare, on tree trunks in forests. Quite likely that this species is exterminated from the area owing to severe deforestation activities.

Fls. & Frts. : February to April.

Specimens examined: Deka 20259 Tharia (Khasi Hills), (ASSAM).

Eria muscicola Lindl. in Journ. Linn. Soc. 3: 47. 1859; Hook.f. Fl. Brit. India 5: 789. 1890; Tuyama in Hara, Fl. East. Himal. 3 Rep. 454. 1975.

Stems short, gregarious, firmly attached on rocks or tree trunks. Leaves 2-6 x 0.4-0.6 cm, oblong, acute, base narrowed to sheathing petioles. Scapes as long as leaves, 1-5-flowered. Bracts 5 mm long, cuneate, straw coloured. Flowers 5-8 mm across, white. Sepals 5 mm long, subulate; petals as long as sepals. Lip subulate, yellow, lower portion serrulate. Capsules very small, 4-5 mm long.

Common on moss covered rocks and on tree trunks in forests.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1896 Mawmluh (Khasi Hills).

Eria paniculata Lindl. in Wall. Pl. As. Rar. 1: 32. t. 36. 1830; et Bot. Reg. 28: 1842; Hook.f. Fl. Brit. India 5: 789. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 126. t. 174. 1898; Seidenfad. et Smitin. Orch. of Thail. 295. t. 223. 1960; Tuyama in Hara, Fl. East. Himal. 2 Rep. 186. 1971.

Stems 20-40 cm long, pendulous, clothed with dry leaf-sheaths. Leaves alternal, distinhous, 10-20 x 0.5-0.8 cm, fleshy, elongated at anthesis, apex acute, base sheathing, glandular all over. Panicles of 3-many branched, digitate spikes, developing from the same point at the axils of the terminal leaves, branches 10-20 cm long, dense-flowered, tomentose. Bracts small, 4-5 mm long, directed downwards. Pedicels 2-4 mm long, hairy. Sepals 2-4 mm long, subequal, tomentose; petals similar to sepals, obtuse, 3-nerved, pinkish-white; lip suborbicular, hypochile concave towards the midlobe. Capsules 0.5-1.5 cm long, elongated with age.

Common on tree trunks; branches of panicles drooping

like horse's tail, hence conspicuous even from a distance.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1647 Jowai (Jaintia Hills); 1842 Burnihat, 3114 Mawsmai (Khasi Hills).

Eria spicata (D. Don) Hand-Mazz. Symb. Sin. 7: 1352. 1936. Octomeris spicata D. Don Fl. Nepal. 31. 1825.-Eria convallarioides Lindl. Gen. Sp. Orch. 70. 1830; Hook.f. Fl. Brit. India 5: 791. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 118. t. 161. 1898.

Pseudobulbs 3-8 x 2 cm, yellow. Stems elongating after flowering. Leaves plicate, oblong-lanceolate, 7-13-nerved, apex acute, petioles of central leaves 2-6 cm long, whereas that of outer leaves indistinct. Flowers dense in spike-like inflorescence, 8 mm across, pinkish-white. Sepals and petals obtuse, subequal. Lip cuneate, reflexed. Column half as long as lip. Capsules 6-8 mm long.

Common on moss covered rocks and on tree trunks in forests.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3276 Nongpoh (Khasi Hills); 3276 Tura peak (Garo Hills); 3042 Jowai (Jaintia Hills).

Eria stricta Lindl. Col. Bot. t. 41B. 1812, et in Journ. Linn. Soc. 3: 52. 1859; Hook.f. Fl. Brit. India 5: 791. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 125. t. 173. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 186. 1971.

Pseudobulbs elongated, cylindric, 5-8 cm long, Leaves 2, 6-8 x 1 cm, oblong, broader towards the upper portion, acute,

plicate, base narrowed to a long petiole. Scapes as long as leaves, with distichous flowers. Bracts short, ovate. Sepals 1 mm long, ovate. Petals similar to sepals. Lip 3-lobed, hairy. Capsules ovoid, white, 1 mm long.

Rare, on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Balakrishnan 50105 Jowai (Jaintia Hills).

Eulophia R. Br.

Eulophia graminea Lindl. Gen. Sp. Orch. 182. 1833; Hook. f. Fl. Brit. India 5: 794. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 176. t. 238. 1898.

Terrestrials. Pseudobulbs large, ovoid, or elongate, jointed, rooting all over. Leaves linear, grass-like, plicate, appearing after flowering. Scapes 30-40 cm high, branched. Branches as long as or shorter than scape, lax-flowered. Bracts 4-8 mm long, acute. Pedicels 1-2 cm long. Flowers 1-2 cm across, greenish-white. Sepals subequal, lateral sepals oblong, acute, reticulate; dorsals equalling laterals. Petals similar to sepals. Lip erect, 3-lobed, sidelobed crested, midlobe rounded, as long as sepals and petals. Spur clavate, 2 mm long, parallel to ovary. Capsules elliptic, oblong, 2 cm long, ribbed.

Common in grasslands of lower elevations.

Fls. & Frts. : February to April.

Specimens examined: Kumar 5516 Balpakrame (Garo Hills), (NEHU).

Galeola Lour.

Galeola falconeri Hook.f. Fl. Brit. India 6: 88. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 265. t. 353. 1898.

Tall, robust leafless saprophytic orchids, 1-2 m high, rootstock stout, 3-6 cm across. Flowers large, pedicelled, 5-6 cm across, yellow, bracts 2-4 x 0.6-1.5 cm, brownish-green, coriaceous. Sepals and petals equalling, 2 cm long, yellowish-green, coriaceous. Lip deep yellow, fimbriate, hemispheric. Capsules 8-10 cm long, ribbed.

Rare, collected only once at Brithawkmia (Pariong) along the dry water channel in deep forests. Robust saprophytic orchids resembling dicots in vegetative phase.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 1841 Pariong (Khasi Hills).

Gastrochilus D. Don

Epiphytic orchids. Pseudobulbs 0. Stems reduced rarely conspicuous. Leaves flat, oblong lanceolate, rarely terete. Peduncles shorter than leaves, few to many-flowered. Flowers in umbellate or paniculate racemes, usually fleshy, wide opening. Lip with a cup-shaped saccate base; midlobe semicircular, often hairy. Column short, foot absent. Pollinia 2.

K E Y T O S P E C I E S

1a. Leaves terete; stems conspicuous, up to 20 cm long.. ..... inconspicuum

1b. Leaves flat; stems reduced less than 10 cm long.

2a. Flowers in umbellate racemes, congested; midlobe of lip hump-like, sidelobes horizontal . . . . . dasypogon

2b. Flowers not in umbellate racemes, lax; midlobe of lip otherwise; sidelobes spreading . . . . . calceolaris

Gastrochilus calceolaris (Sm.) D. Don Prodr. Fl. Nepal. 32. 1825; Seidenfad. & Smitin. Orch. Thail. 632. t. 474. 1963; Tuyama in Hara, Fl. East. Himal. 435. 1966. - - Aerides calceolare Hamilt. ex Sm. in Rees, Cyclop. 39: 11. 1818. - - Saccolabium calceolare (Sm.) Lindl. Gen. Sp. Orch. 223. 1833; Hook.f. Fl. Brit. India 6: 632. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 225. t. 300. 1898.

Roots tufted, subcompressed. Stems very short, 1-2 cm long. Leaves 2-5, 20 x 2-3 cm, obliquely oblong, notched at the apex, with one lobe lower than the other, median nerve or rib more prominent, Peduncles very short, 2 cm long, few-flowered. Flowers pink. Sepals oblong, dorsal sepals larger than laterals. Petals smaller than sepals. Lip crested, midlobe rounded, sidelobes spreading. Pollinia 2, with long caudicle. Ovary twisted, 2-3 cm long.

Rare, collected only once from Balpakram.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 2930 Balpakram (Garo Hills).

Gastrochilus dasypogon (Sm. ex Rees) O. Kuntze, Rev. Gen. Pl. 2: 661. 1891. - - Aerides dasypogon Sm. in Rees, Cyclop. 39: n. 10. 1818. - - Saccolabrium dasypogon Lindl. Gen. Sp. Orch.

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Goodyera R. Br.

Terrestrials. Stems decumbent or creeping below. Flowers small, often in twisted spikes. Sepals spreading, upper forming a hood with petals. Petals smaller than sepals. Lip hollow or saccate, not lobed. Column short. Rostellum deeply split, erect. Pollinia penduleus. Stigma broad.

K E Y T O S P E C I E S

1a. Stems robust, 20-40 cm high; leaves 10-20 cm long, coriaceous, uniformly green or pale green . procera

1b. Stems slender or if robust not more than 15 cm high; leaves less than 10 cm long, usually with white horizontal patches . . . . . secundiflora

Goodyera procera Hook.f. Exot. Fl. t. 39. 1823; et Fl. Brit. India 5: 111. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 282. t. 278. 1898; Tuyama in Hara, Fl. East. Himal. 436. 1966.

Stems 20-40 cm high, clothed with leaf-sheaths. Leaves subradical, 8-20 x 3-4 cm, lanceolate, base sheathing. Scapes 25-30 cm long, clothed with sheathing bracts at each node. Racemes 5-10 cm long, dense-flowered, recurved at the apex. Flowers 3-4 mm across, sessile, white. Sepals obtuse, 1-nerved; petals spathulate, as long as sepals. Lip shorter than sepals, saccate. Capsules 3-4 cm long.

Occasional as forest undergrowth in lower elevation.

Fls. & Frts. : June to August.

Specimens examined: Kumar 5317 Balpagram (Garo Hills), (NEHU).

Goodyera secundiflora Lindl. in Journ. Linn. Soc. 1: 182. 1857; Hook.f. Fl. Brit. India 6: 113. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 282. t. 375. 1898; Tuyama in Hara, Fl. East. Himal. 2nd Rep. 188. 1971.

Stems short, up to 10 cm high, clothed with leaf-sheaths. Leaves 2-6, in a whorl near the base, 1-3 x 1-3 cm, ovate, green mottled with horizontal white bands. Scapes variable, 10-20 cm long, few-flowered. Flowers secund, 5-8 mm across, white, hairy. Sepals 5-7 mm long, cuneate, falcate, 1-nerved. Petals as long as sepals, clavate, acute, clawed, white, reflexed, lip saccate, sparsely hairy within, outcurved. Column cuneate, beaked, Capsules twisted near the apex.

Common in pine forests as well as in broad leaved forests, usually amidst litter and debrices. This species can be easily identified by the white bands on leaves, secund and setosose flowers.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3062 Shillong peak.

Habenaria Willd.

Terrestrials. Leaves sheathing at base. Flowers small, greenish or yellowish-green in racemes or spikes. Sepals subequal, dorsal sepals often convinent with petals forming a hood. Lip continuous with column, entire or 3-lobed with long spur. Anther bases produced to a short or long tube. Pollinia granular, erect between the lobes of anthers.

K E Y T O S P E C I E S

1a. Flowers large, about 6 cm across, sidelobes broad, with many filiform segments . . . . . arietina

1b. Flowers small, less than 2 cm across; sidelobes of lip entire, rarely segmented.

2a. Petals bipartite, sepals with aristate tips, often drawn out in a thread, or their tips with a mucro at the back, sometimes prolonged in a thread . . stenopetala

2b. Petals not bipartite; sepals otherwise.

3a. Lateral sepals oblique with 3 curved veins at the throat of spur; racemes many-flowered; spur shorter than ovary . . . . . malleifera

3b. Lateral sepals not oblique, if slightly oblique, then lip with transversal ridge at the throat of spur; spur variable, as long as or shorter than ovary.

4a. Leaves more than 2, subradical or spreading, placed away from ground level.

5a. Thecae long, straight or geniculately turned upwards.

6a. Sidelobes of lip subulate, much shorter than midlobe, perpendicular to the axis; spur 1-2 cm long . . . . . acuifera

6b. Sidelobes of lip equalling midlobe in length, spur clavate, 1.5 cm long . . . . . tonkinensis

5b. Thecae short, straight.

7a. Dorsal sepals nearly as long as laterals; sidelobes of lip thin, thread-like much longer than midlobe; petals slender, triangular, longer than sepals; leaves linear, grass-like, 5 mm or less across.. ..... khasiana

7b. Dorsal sepals shorter than lateral sepals; sidelobes of lip nearly as broad as the midlobe, not much longer; petals broad, triangular, ovate, shorter than lateral sepals; leaves lanceolate, broader than above . . viridiflora

4b. Leaves 2-3, radical more or less on the ground surface . . . . . siamensis

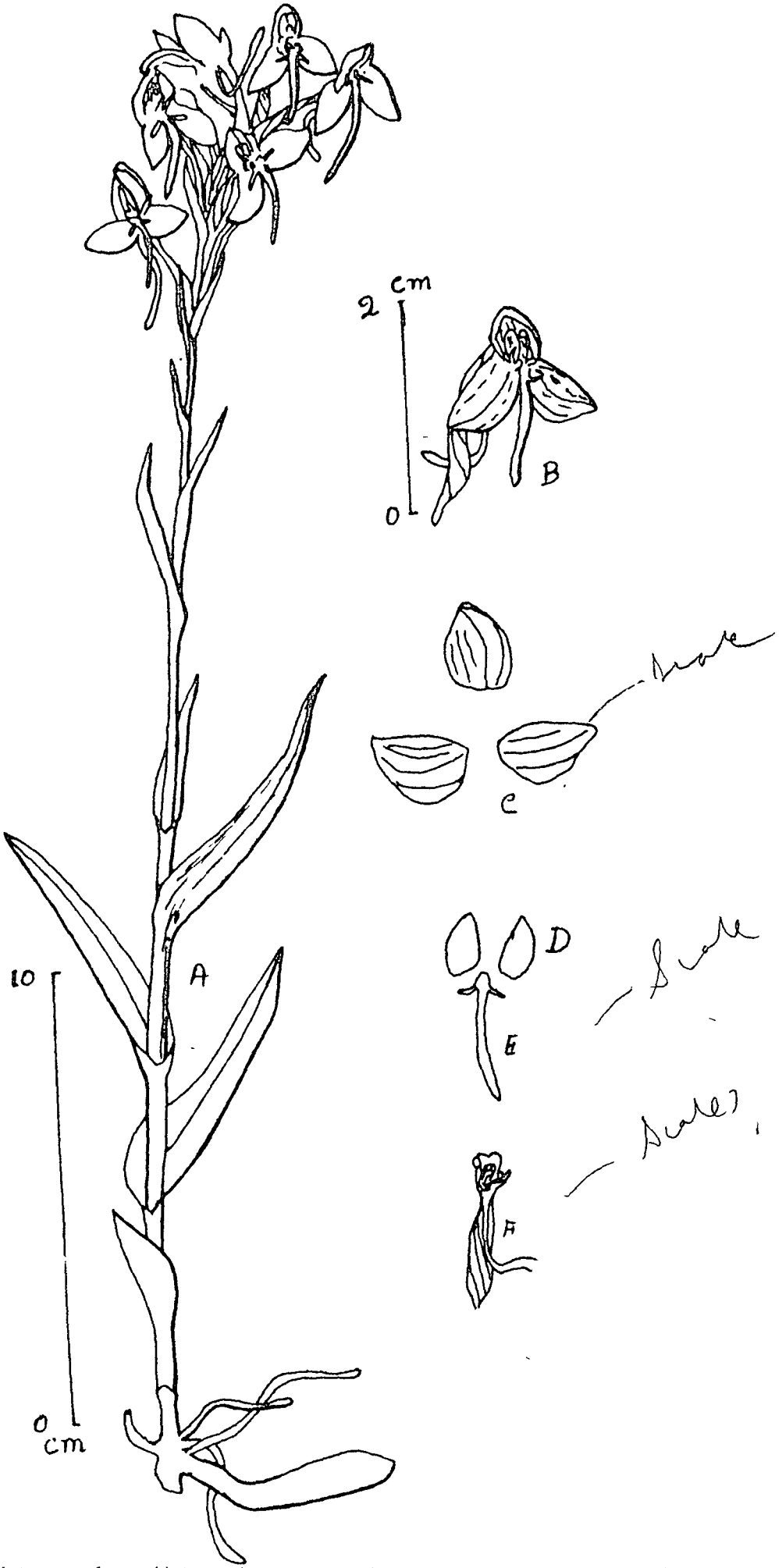


Plate 105 Habenaria acuifera Wall. ex Lindl. A. Habit, B. Flower, C. Sepals, D. Petals, E. Labellum, F. Column and Spur.

Habenaria acuifera Wall. ex Lindl. Gen. Sp. Orch. 325. 1835; Hook.f. Fl. Brit. India 6: 146. 1890; Seidenfad. in Dansk Bot. Ark. 31(3): 106. t. 64. 1977.

Leaves few, sub-radical, 5-10 x 0.5-1 cm, acute. Scapes 10-30 cm long. Flowers 5-10, in racemes, yellow. Sepals 5 mm long, greenish-yellow, 3-nerved. Petals as long as sepals, yellow. Lip 1 cm long, 3-lobed, lateral lobes 5-6 mm long, midlobes up to 1 cm long, Spur 8 mm long, subclavate, reflexed. Ovary 1 cm long, fusiform. Capsules 2 cm long, ribbed.

Common both in open and shrubby areas, specially in grasslands, associated with grasses and sedges.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 3027 Shillong, 3273 Burnihat (Khasi Hills).

Habenaria arietina Hook.f. Fl. Brit. India 6: 138. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 311. t. 407. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 147. 1975.

Stems 30-60 cm high, glabrous. Leaves sessile, cauline, alternate, 4-15 x 1.5-2 cm, clasping round the stem, membranous; Flowers yellowish-green, 2-3 cm across. Sepals cuneate, oblique, 2 cm long. Petals similar to sepals, broader, slightly pubescent. Lip spreading, lobed, sidelobes with many filiform segments, midlobe not segmented. Spur 3 cm long, clavate, longer than ovary. Capsules 5 cm long.

Common in open and shrubby areas in association with grasses and other herbaceous plants. This species can be easily

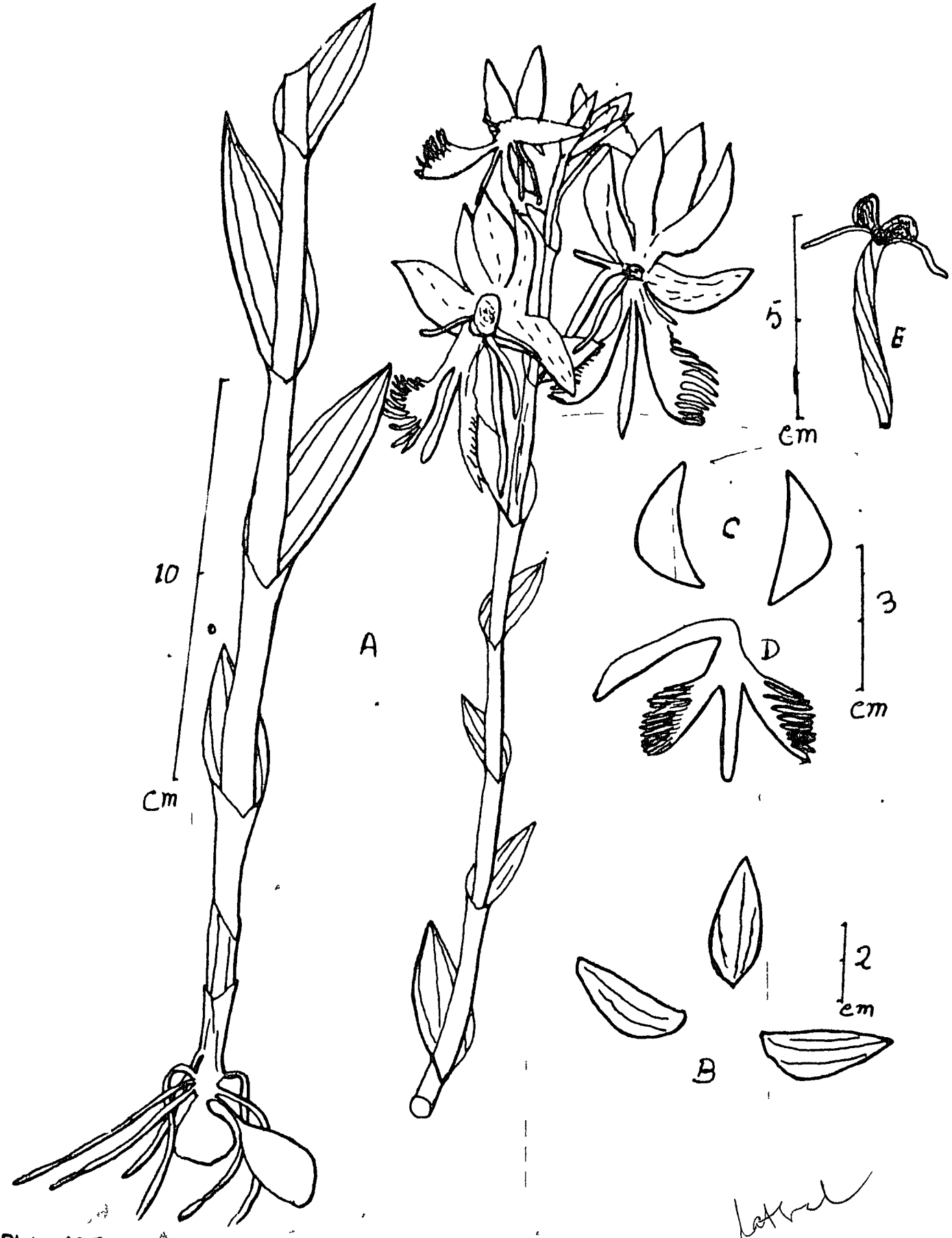


Plate 106 Habenaria arietina Hook.f. A. Portions of plant, B. Sepals, C. Petals, D. Labellum, E. Column and Spur.

recognised from a distance on account of their bright showy, conspicuous flowers.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 3280 Smit (Khasi Hills).

Habenaria khasiana Hook.f. Fl. Brit. India 6: 151. 1890; Seidenfad. in Dansk Bot. Ark. 31(3): 118. t. 73. 1977.

Scapes 10-20 cm high. Leaves radical, upper leaves reduced, bract-like, blades 2-8 x 0.4-0.6 cm, green, acute. Flowers lax, in racemes, bracts 5 mm long, acute. Sepals filiform, 4-5 mm long, green. Petals as long as sepals, much broader than sepals. Lip broader than sepals, rounded at apex, 3-lobed, green. Spurs 1-1.3 cm long, longer than ovary, rostellum short. Capsules 1-1.2 cm long, fusiform.

Common in open areas, associated with grasses and mostly concealed among the latter.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1804 Mawsmai (Khasi Hills).

Habenaria malleifera Hook.f. Fl. Brit. India 6: 143. 1890; Seidenfad. in Dansk Bot. Ark. 31(3): 96. t. 57. 1977.

Leaves 4-5, subradical, 15-20 x 4-5 cm, lanceolate, many-nerved, acute, base narrowed to sheathing base. Scapes 30-40 cm long, jointed, with leafy bracts at each node. Spikes up to 20 cm long, lax-flowered, axis with glandulous sticky hairs. Flowering bracts 1-2 cm long, cuneate, finely acuminate. Flowers white, 1-1.5 cm across. Sepals ovate-oblique, 5 x 4 mm; petals as long as

sepals but broader. Lip 3-lobed. Spur as long as lip, clavate. Ovary fusiform, 1-3 cm long, gradually narrowed towards the apex, hairy.

Rare, collected only once from Tura peak, along road cuttings. Associated with grasses and other herbaceous plants.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1925 Tura peak (Garo Hills).

Habenaria siamensis Schltr. Fed. Repert. 2: 82. 1906; Seidenfad. in Dansk Bot. Ark. 31(3): 130. t. 82. 1977.

Leaves usually 2, radical, 2 x 1.5 cm, ovate, obtuse. Scapes 30 cm long, including spikes. Bracts 1 cm long, flowering bracts 6 mm long. Flowers 4-6, 6 mm across. Sepals 4-5 mm long, linear, green. Petals as long as sepals, greenish-yellow. Lip 3-lobed, sidelobes filiform, twice as long as sepals and petals; midlobe shorter than sepals. Ovary lanceolate, pointed at both ends, ribbed.

Common in grasslands, associated with grasses and sedges.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1085 Shillong.

Habenaria stenopetala Lindl. Gen. Sp. Orch. 319. 1835; Hook.f. Fl. Brit. India 6: 134. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 308. t. 404. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 156. 1975.

Roots fleshy, white. Stems 30-50 cm high, greenish-white, clothed with reduced leaf-sheaths in the lower portion. Leaves

alternate, ovate-lanceolate, 10-15 x 2-4 cm, glabrous, apex caudate, base narrowed to a broad petiole, amplexicual, coriaceous Flowers dense, greenish-white, sepals ovate-lanceolate, 1.5 cm long, 3-nerved, finely acuminate. Petals filiform, as long as sepals. Lip 3-lobed, sidelobes as long as midlobe, filiform or subulate. Spur clavate, as long as ovary.

Rare, collected only once in dense forests.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1888 Mawsmai (Khasi Hills).

Habenaria tonkinensis Seidenfad. in Dansk Bot. Ark. 31(3): 114. t. 70. 1977.

Stems short, 2 cm long. Leaves radical, 8-10, subulate, 4-8 x 0.6-1 cm, acute or acuminate, base sheathing, green, 1-nerved. Racemes up to 30 cm long, 5-6-nodded, clothed with ovate-acute bracts. Flowering bracts 6 mm long, 1-nerved. Flowers including pedicels 2 cm long. Sepals ovate, 4 mm long; petals equalling sepals. Lip ovate, concave, as long as sepals. Spur longer than slender ovary. Capsules 1 cm long.

Rare; in grasslands associated with grasses and sedges. This species is placed under H. khasiana by some authors, but it differs from the latter in having many radical leaves, much larger flowers and also by spurs which are much longer than ovary. It also resembles H. viridiflora but differs in the number of leaves and tufted roots above the tubers.

Fls. & Frts. : May to June.

Specimens examined: Myrtnong 2987 Burnihat (Khasi Hills).

Habenaria virifidlora R. Br. Prodr. 312. 1810; Hook.f. Fl. Brit. India 6: 150. 1890; Seidenfad. in Dansk Bot. Ark. 31(3): 118. t. 74. 1977.

Roots tuberous, fleshy. Leaves 4-10 x 0.2-0.4 cm, radical, linear, acute. Scapes 10-20 cm high, dense-flowered, with leafy bracts at each node. Flowers terminal, 8-15, alternate, greenish-yellow, 1 cm across. Sepals cuneate, 2-4 mm long; petals as long as sepals, broader. Lip 3-partite, with filiform, lateral segments; spur 1.5-2 cm long, clavate. Ovary as long as spur. Capsules beaked, fusiform.

Common in grasslands, closely associated with grasses.

Fls. & Frts. : July to October.

Specimens examined: Myrthong 1876 Sutnga (Jaintia Hills).

Herminium Linn.

Herminium angustifolium (Lindl.) Benth. ex Hook.f. Fl. Brit. India 6: 129. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 332. t. 434. 1898.

Terrestrials. Roots tuberous. Stems 20-60 cm high. Leaves few, with upper ones reduced to scales or bracts. Blades 5-10 x 0.5-1 cm, linear, acute, sheathing at base. Spikes 10-20 cm long. Flowers spirally arranged on the rachis. Bracts 5-8 mm long, green. Sepals 2-4 mm long, margin membranous. Petals similar to sepals, rounded at the apex. Lip 3-lobed, sidelobes longer than the inconspicuous midlobe. Pollinia 2, emerging out from the caudicle, Capsules 0.6-1 cm long, erect, overlapping the base of the others.

Common both in open and shrubby localities, associated with other herbaceous vegetations.

Fls. & Frts. : July to November..

Specimens examined: Myrthong 1848, 1028 Shillong.

Ione Lindl.

Epiphytes. Leaves solitary. Scapes from the base of the pseudobulbs. Flowers solitary or paired or rarely few in racemes, or heads. Sepals membranous, lateral sepals connate. Petals shorter than sepals. Lip adnate to the foot of the column, ligulate at the apex. Column short, foot 0. Pollinia 4.

K E Y T O S P E C I E S

1a. Lateral sepals connate at least one third of their length; edges of sidelobes of lip fimbriate . . bicolor

1b. Lateral sepals free; edges of sidelobes of lip entire . . . . . candida

Ione bicolor Lindl. Fol. Orch. 3. 1853; Seidenfad. in Saertryk Botanisk Tidsskrift 64: 216. 1969; Tuyan in Hara, Fl. East. Himal. 2 Rep. 190. 1971. - - Bulbophyllum bicolor (Lindl.) Hook.f. Fl. Brit. India 5: 770. 1890.

Rhizomes prostrate, pseudobulbs conic, 1 cm long, 1-leaved. Leaves linear-oblong, 4-6 x 0.6-1 cm, midrib distinct, apex retuse or shallowly notched. Scapes shorter than leaves, few-flowered. Flowers small, 3 mm across, pinkish-white. Sepals whitish-pink. Petals ovate-oblong, crenulate. Lip 3-lobed, sidelobes wavy, midlobe emarginate. Capsules 2-3 mm long, elliptic.

Common on rocks and on tree trunks in forests.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 2991 Shillong peak.

Ione candida Lindl. Fol. Orch. 3. 1853; Seidenfad. in Saertryk Botanisk Tidsskrift 64: 222. t. 9. 1969.

Pseudobulbs clustered, ovoid, 1-2 cm long. Leaves oblong, 5-8 x 0.6-0.8 cm, acute, base narrowed to a short petiole. Scapes longer than leaves, few-flowered. Flowers white, 4 mm across. Sepals linear, obtuse. Petals filiform, Lip broad, 2 mm long, entire, yellow, ensiform. Capsules 5 mm long, elliptic, obtusely angled.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 1801 Mawmluh (Khasi Hills).

Liparis Richard.

Terrestrial or epiphytic orchids. Leaves 1, 2 or many, on pseudobulbs or on leafy stems. Flowers small in terminal racemes, green, white or violet. Sepals and petals erect or reflexed. Petals often smaller than sepals. Lip adnate to the base of column, not lobed, apex entire or 2-lobed; column long, curved, winged at the apex. Pollinia 4.

K E Y T O S P E C I E S

1a. Terrestrials; leaves not jointed.

2a. Leaves 2-3.

3a. Lip lanceolate, apex triangular, acute . . petiolata

3b. Lip otherwise, apex truncate or notched or rounded not acute.

4a. Apex of lip truncate, fimbriate; bracts slender; leaves usually 3. . . . . wrayii

4b. Apex of lip subacute, entire, dentate or erose, not fimbriate; leaves 2 . . . . . cathcartii

2b. Leaves 3-6.

5a. Petals linear, 1-nerved; calli distinct, subulate . . . . . acuminata

5b. Petals spathulate, 3-nerved, or more; calli not distinct.

6a. Leaves linear, grass-like, subplicate . . ferruginea

6b. Leaves ovate to ovate-lanceolate, coriaceous, not plicate . . . . . paradoxa

1b. Epiphytes.

7a. Lip spreading, equalling the lateral sepals; column slender, winged or not.

8a. Pseudobulbs 1-leaved.

9a. Sepals obscurely 3 or more nerved.

10a. Lip deeply lobed, margin crenulate . . latifolia

10b. Lip truncate or evaginate,not lobed, entire . . . . . bootanensis

9b. Sepals 1-nerved.

11a. Lip with distinct sidelobes . . . . . mannii

11b. Lip without sidelobes . . . . . caespitosa

8b. Pseudobulbs 2 or more leaved.

12a. Sepals 3-5-nerved; lip orbicular . . . . plantaginea

12b. Sepals 1-nerved; lip otherwise.

13a. Dorsal sepals 4-8 mm long; lip recurved, cuneate, or apiculate . . . . . luteola

13b. Dorsal sepals less than 4 mm long; lip otherwise.

14a. Lip truncate . . . . . vestita

14b. Lip acute, triangular.

15a. Pseudobulbs short, lanceolate with sharp winged edges; lip recurved in the middle with ear-like marginal folds . . elliptica

15b. Pseudobulbs conical or cylindric; lip V-shaped, recurved, without ear-like folds . . . . viridiflora

7b. Lip shorter than lateral sepals; column winged or keeled.

16a. Lip ovate-lanceolate without calli; column curved assamica

16b. Lip oblong with 2 distinct calli; column reflexed glossula

Liparis acuminata Hook.f. Fl. Brit. India 5: 696. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 34. t. 18. 1976.

Terrestrials. Roots tufted. Stems 5-10 cm long, clothed with sheaths. Leaves 4-5, crowded, ovate, acute, base narrowed to a sheathing petiole, apex caudately acuminate, coriaceous, blades 5-15 x 4-6 cm. Scapes 15-25 cm long, dense-flowered. Flowers 6 mm across, pinkish-green. Sepals lanceolate-oblong, rounded, at the apex, laterals obliquely falcate, dorsal linear. Petals filiform, falcate, broader towards the apex, 1-nerved. Lip orbicular, 4 mm across, margin crenulate. Column reflexed, incurved. Capsules 1 cm long.

Common on old road cuttings and on slopes of secondary forests.

Fls. & Frts. : September.

Specimens examined: Myrthong 778 Bhoi area (Khasi Hills).

Liparis assamica King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 36. t. 53. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 86. 1976.

Epiphytes. Pseudobulbs clustered, 2-3 cm long. Leaves 5-8 x 1 cm, linear-lanceolate. Scapes dense-flowered, longer than leaves. Flowers white, 1 cm across. Sepals small, acute;

petals similar to sepals. Lip broader than sepals and petals, rounded or obtuse, shortly clawed. Capsules 1 cm long, oblong.

Rare, on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Deka 8780 Shillong (ASSAM).

Liparis bootanensis Griff. Itin. Not. 98. 1848; Hook.f. Fl. Brit. India 5: 700. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 30. t. 40. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 50.t. 28. 1976.

Epiphytes. Pseudobulbs slender, clothed with dry sheaths. Leaves 10-15 x 1.5-2.5 cm, linear-lanceolate, apex caudately acuminate, base narrowed to sheathing petiole. Scapes slender, shorter than leaves. Flowers 0.8-1 cm across. Sepals and petals subequal, linear, acute. Lip 4 mm across, pinkish-red within. Capsules 6 mm long, ribbed.

Common on moss covered rocks and on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1399 Mawphlang (Khasi Hills).

Liparis caespitosa (Thouars.) Lindl. Bot. Reg. 11. sub. t. 882. 1825; Seidenfad. in Dansk Bot. Ark. 31(1): 61. t. 38. 1976. Malaxis caespitosa Thouars. Orch. Ill. Agr. t. 89. 1822. - - Liparis pusilla Ridl. Journ. Linn. Soc. 22: 294. 1886; Hook.f. Fl. Brit. India 5: 701. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 32. t. 41. 1898.

Epiphytes. Pseudobulbs clustered, 1-leaved. Leaves 5-8 x 2 cm, lanceolate, sheathing at base. Scapes as long as or

slightly longer than leaves, lax-flowered. Flowers 4 mm across, green. Bracts as long as ovary, acute. Sepals subulate, obtuse, 1-nerved, lateral sepals broader than dorsal ones. Petals cuneate, obtuse. Lip broad, recurved, entire, acuminate. Column subfalcate, truncate with 2 incurved lobes. Capsules 8 mm long.

Common on tree trunks and on moss covered rocks.

Fls. & Frts. : August to October.

Specimens examined: Deka 12765 Sweet Falls (Khasi Hills), (ASSAM).

Liparis cathcartii Hook.f. Icon. Pl. t. 1808. 1889; et Fl. Brit. India 5: 694. 1890. King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 25. t. 30. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 24. 1976.

Terrestrials. Leaves 2-3, opposite, petioled, oblong, acute, base subcordate, blades 4-6 x 2-3 cm, 5-nerved, lowest leaf reduced to membranous sheath. Scapes 10-20 cm long, few-flowered. Flowers 5 mm across. Sepals linear, acute, 2 mm long. Petals equalling sepals. Lip 4-5 mm across, 3-lobed, midlobe crenulate, as long as sepals, sidelobes short. Capsules 1 cm long.

Common in deep forests amidst litters.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 3064 Mawphlang(Khasi Hills).

Liparis ollipiica Wight Icon. 5: t. 1735. 1852; Seidenfad. in Dansk Bot. Ark. 31(1): 79. t. 54. 1976. - - Liparis viridiflora Lindl. Gen. Sp. Orch. 31. 1830; Hook.f. Fl. Brit. India 5: 704. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 35. t. 47. 1898.

Epiphytic orchids. Roots tufted, rhizomes prostrate with crowded pseudobulbs. Pseudobulbs 1-2 x 1 cm, ovoid, elliptic, truncate, 1-leaved. Leaves linear-lanceolate, 6-8 x 2 cm, acuminate, base narrowed to a short petiole. Scapes longer than leaves, laterally compressed below the inflorescence, winged. Racemes 5-6 cm long, dense-flowered, with green, persistent, linear bracts. Flowers 4 mm across. Sepals ovate-spathulate, obtuse, dorsal sepals smaller than laterals. Petals filiform, 2 mm long, acute. Lip ovate, 3-lobed, sidelobes minute, near the apex of the midlobe, midlobe cuneate, acute. Capsules oblong, 5 mm long.

Rare, on tree trunks in deep shady places in forests.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 2993 Shillong peak.

Liparis ferruginea Lindl. Gard. Chron. 155. 1848; Hook.f. Fl. Brit. India 5: 697. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 40. 23. 1976.

Terrestrials. Roots tufted, not tuberous. Stems short, 5-10 cm long, clothed with leaf-sheaths, swollen into pseudobulbs, or sometimes slender. Leaves crowded near the base, 3-5, linear-lanceolate, subplicate, sessile, base sheathing. Scapes 20-35 cm high, lax-flowered. Bracts 5-8 mm long, linear-acute, pedicels as long as bracts. Flowers 6-8 mm across, yellowish-green. Sepals linear-subulate, 1-nerved. Petals similar to and as long as sepals. Lip 4 mm across, cymbiform, lobes obscure. Column shorter than sepals, clavate, truncate at apex. Capsules oblong, sub-fusiform, 2 cm long, with wavy ridges.

Common in marshes associated with grasses and sedges.

Fls. & Frts. : August to November.

Specimens examined: Myrthong 1087 Barapani, 1980 Mawmluh (Khasi Hills).

Liparis glossula Reichb. f. in Linneae 41: 44. 1877; Hook.f. Fl. Brit. India 5: 693. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 26. t. 32. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 159. 1975; Seidenfad. in Dansk Bot. Ark. 31(1): 11. 1976.

Epiphytes. Pseudobulbs slender, clothed with leaf-sheaths. Leaves 10-20 x 2-3 cm, oblong-lanceolate, acute, base narrowed to a sheathing petiole. Scapes as long as leaves, lax-flowered. Bracts linear, filiform, 1 cm long. Flowers 0.8-1 cm across, yellow. Sepals linear, 8 mm long, 1-nerved, greenish-yellow. Petals equalling sepals. Lip 6-8 mm across, rounded, slightly clawed at the base. Capsules 5-6 mm long, clavate.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 3036 Shillong peak.

Liparis latifolia (Bl.) Lindl. Gen. Sp. Orch. 30. 1830; Hook.f. Fl. Brit. India 5:182. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 54. t. 31. 1976. — Bhuyan?.

Epiphytes. Pseudobulbs clustered, 2-4 cm long, acute, 1-leaved. Leaves oblong-lanceolate, 10-20 x 2-3 cm, acute, base narrowed to a broad channelled petiole. Scapes longer than leaves, clothed at base by dry fibrous sheaths, laterally compressed, winged. Racemes 10-15 cm long, with few persistent

green bracts. Rachis winged all over. Pedicels 6-8 mm long. Flowers 1 cm across, yellowish-green. Sepals ovate, rounded. Petals linear. Lip 2-lobed, clawed, lobes crenulate, sinus 1.5 cm deep. Column stout, incurved. Capsules elliptic, oblong, 0.8-cm long, ribbed.

Common on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2996 Shillong peak.

Liparis luteola Lindl. Gen. Sp. Orch. 32. 1830; Hook.f. Fl. Brit. India 5: 704. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 78. T. 52. 1976.

Pseudobulbs ovoid, clustered, 2-leaved. Leaves 5-8 x 0.5-1 cm, strongly 1-nerved, base narrowed to a petiole. Scapes 5-10 cm long, few-flowered, angular. Bracts cuneate, 4-5 mm long, membranous. Flowers 5-8 mm across, white. Pedicels 5-6 mm long, slender. Sepals subequal, linear, oblong, obscurely 1-nerved. Petals similar to sepals. Lip broad, up to 4 mm across, rounded. Column fleshy, as long as half the length of petals. Capsules fusiform, subclavate, 1 cm long, ribbed.

Common on tree trunks and on moss covered rocks in forests, specially in shady localities.

Fls. & Frts. : December to January.

Specimens examined: Myrthong 3089 Jowai (Jaintia Hills).

Liparis mannii Reichb. f. Flora 55: 275. 1872; Hook.f. Fl. Brit. India 5: 701. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 31. t. 51. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 60. t. 36. 1976.

Epiphytes. Pseudobulbs tufted, conic, 1-leaved. Leaves 20-25 x 2 cm, linear, grass-like, acute, base broad, sheathing. Scapes shorter than leaves, dense-flowered. Bracts minute, green. Flowers 3-4 mm across. Sepals 1-nerved, ovate-lanceolate, dorsal sepal narrower. Petals linear, 1-nerved, acute. Lip cuneate, 3-lobed, sidelobes truncate, midlobe acute, longer than sidelobes. Column constricted in the upper part, obliquely truncate, with beaked hook. Capsules 8 mm long, oblong.

Occasional on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : July to September.

Specimens examined: Kataki 22262 Shillong (ASSAM).

Liparis paradoxa (Lindl.) Reichb.f. in Walp. Ann. 6: 218. 1861; Hook.f. Fl. Brit. India 5: 697. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 27. t. 34. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 38. t. 22. 1976.

Terrestrials. Stems 2-5 cm long, clothed with leaf-sheaths, base pseudobulbous. Leaves 3-5, ovate-lanceolate, sheathing at base. Scapes longer than leaves, few-flowered. Flowers 6-8 mm across. Sepals spathulate, dorsal sepals longer than laterals; petals as long as dorsal sepal, spathulate. Lip suborbicular, truncate. Column fleshy, curved near the apex. Capsules 8 mm long, ribbed.

Common in shrubby areas associated with other herbaceous vegetation.

Fls. & Frts. : July to November.

Specimens examined: Myrthong 1897 Trongpleng (Khasi Hills).

Liparis petiolata (D. Don) Hunt & Summerh. in Kew Bull. 20: 52. 1965; Seidenfad. in Dansk Bot. Ark. 31(1): 12. t. 3. 1976. Acianthus petiolatus D. Don Prodr. Fl. Nepal. 29. 1825. - - Liparis nepalensis Lindl. Bot. Reg. 11. sub. t. 882. 1825; Hook. f. Fl. Brit. India 5: 693. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 26. t. 37. 1898.

Terrestrials. Stems rooting from the geniculate base, 10-20 cm high. Leaves usually 2, ovate, acute, petioled. Scapes 10-15 cm high, few-flowered. Flowers 1 cm across, pinkish-green. Sepals and petals similar, lanceolate, acute. Lip ovate, acute, reflexed. Capsules 1 cm long, ribbed.

Occasional in forests. Difficult to distinguish from Liparis cathcartii excepting for the paired leaves.

Fls. & Frts. : October to November.

Specimens examined: Panigrahi 3075 Pynursla (Khasi Hills), (ASSAM).

Liparis plantaginea Lindl. Gen. Sp. Orch. 29. 1830; Hook. f. Fl. Brit. India 5: 702. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 29. t. 36. 1898; Seidenfad. in Dansk Bot. Ark. 31(1): 75. t. 48. 1976.

Epiphytes sometimes terrestrials. Pseudobulbs slender, subconic, 3-5 cm long. Leaves 2, oblong-lanceolate, 15-25 x 4-5 cm, plicate, sheathing at base. Scapes as long as or longer than leaves , lax-flowered. Bracts ovate. Sepals obtuse, greenish-yellow, 3-nerved. Petals as long as sepals, slightly narrower. Lip broad, curved from below the middle, reflexed, crenulate,

suborbicular, Column incurved, fleshy. Capsules 0.8-1.2 cm long.

Rare, on moss covered rocks and on tree trunks in forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 1833 Laitlyngkot (Khasi Hills).

Liparis vestita Reichb. f. Flora 55: 274. 1872; Hook.f. Fl. Brit. India 5: 703. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 79.t. 53. 1976.

Epiphytes. Pseudobulbs slender, stem-like, rarely swollen, naked or clothed with foliaceous sheaths at the base. Leaves 2, 5-8 x 2.5-3 cm, linear-lanceolate, acute, base sheathing. Scapes longer than leaves, dense-flowered. Bracts subulate, green, as long as or longer than ovary. Flowers 4 mm across. Sepals cymbiform, lanceolate, rounded at apex. Petals filiform, as long as sepals. Lip decurved from below the middle, shortly clawed, truncate, or shallowly notched. Column short, fleshy, falcate. Capsules 1 cm long, ribbed.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts.: September to November.

Specimens examined: Rao 28198 Nongstoin (Khasi Hills), (ASSAM).

Liparis viridiflora (Bl.) Lindl. Gen. Sp. Orch. 31. 1830; Hook.f. Fl. Brit. India 5: 704. 1890; Tuyama in Hara Fl. East. Himal. 2 Rep. 191. 1971; Seidenfad. in Dansk Bot. Ark. 31(1): 82. t. 55. 1976. - - Malaxis viridiflora Bl. Bijdr. 392. 1825. - - Liparis longipes Lindl. in Wall. Pl. As. Rar. 1: 31. t. 35. 1830; et Gen. Sp. Orch. 30. 1830; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 29. t. 37. 1898.

Epiphytes. Pseudobulbs slender, stem-like, clothed with sheathing leaves. Leaves linear, lanceolate, 15-20 x 2-2.5 cm, sheathing at the base. Scapes longer than leaves, dense-flowered, laterally compressed below the racemes, winged. Racemes 10-15 cm long. Bracts green 0.6-1.5 cm long. Pedicels including ovary 1-1.2 cm long. Flowers 8 mm across, green, turning yellow with age. Sepals subulate, twisted, 1 mm across, falcate, dorsal sepals falcate, as long as laterals. Petals filiform, as long as sepals. Lip broad, 4-5 mm across, reflexed. recurved near the base, clawed, apex truncate or notched, apiculate in the depressed apex. Column as long as the claw of the lip, recurved with triangular apex.

Common in forests on tree trunks.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 2989 Shillong.

Liparis wrayii Hook.f. Fl. Brit. India 6: 181. 1890; Seidenfad. in Dansk Bot. Ark. 31(1): 15. t. 5. 1976.

Terrestrials. Stems 5-10 cm high, clothed with sheaths, slender or sometimes bulbous. Leaves 3-5, ovate-oblong or ovate-lanceolate, plicate, base sheathing. Scapes as long as or longer than leaves, moderately dense-flowered. Flowers 6-8 mm across, pinkish-violet. Sepals subequal, oblong, rounded at apex. Petals much narrower than sepals. Lip subspathulate, truncate or notched, margin crenulate or fimbriate. Column fleshy, as long as claw of lip. Capsules 1.2 cm long.

Common in forests amidst litters.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 2992 Shillong peak.

Luisia Gaud.

Luisia trichorhiza (W.J. Hooker) Bl. Mus. Bot. Lugd. Bat. 1: 63. 1849; Hook.f. Fl. Brit. India 6: 23. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 202. t. 270. 1898; Seidenfad. in Dansk Bot. Ark. 27(4): 66. 1971. - - Vanda trichorhiza W. J. Hooker Fl. Exot. t. 72. 1825.

Epiphytes. Roots flat, ridged in the centre. Stems clothed with dry, old sheaths, 25-40 cm long. Leaves terete, 15-20 cm long, acute, branch-like. Flowers congested in leaf-opposed peduncle, pink, 1.5-2 cm across. Sepals 1 cm long, rounded. Petals as long as sepals. Lip oblong, slightly longer than sepals and petals, deep pink towards the base, flat, constricted near the base. Column long, subcymbiform, rounded at apex. Capsules including pedicels 3 cm oblong, ribbed.

Common on tree trunks in deciduous forests and occasional in pine forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2925 Rongjeng (Garo Hills).

Malaxis Soland ex Sw.

Terrestrials. Stems pseudobulbous or not. Leaves broad, often unequal at base. Flowers small, in racemes or spikes. Sepals and petals spreading, petals smaller than sepals. Lip more or less flat, with usually hollow, auricled lobes. Column short, winged. Anther on the back of the column, pollinia free.

K E Y T O S P E C I E S

1a. Apex of lip notched or 2-fid; auricles of lip acute . . . . . acuminata

1b. Apex of lip 3-lobed; auricles of lip obtuse.. ..... latifolia

Malaxis acuminata D. Don Prodr. Fl. Nepal. 29. 1825; Tuyama in Hara, Fl. East. Himal. 2 Rep. 191. 1971. - - Microstylis wallichii Lindl. Gen. Sp. Orch. 20. 1830; Hook.f. Fl. Brit. India 5: 686. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 15. t. 18. 1898.

Roots tufted. Leaves subradical, 3-5, linear, 8-15 x 1.5-2 cm, acute, base sheathing. Scapes including racemes 25-40 cm long, few-flowered. Flowers alternate, 5 mm across. Sepals 2-3 mm long, ovate, acute. Petals as long as sepals, ovate, oblong. Lip notched at apex, auriculate, Spur 6 mm long, subclavate. Capsules fusiform, 1.5-2 cm long, ribbed.

Common in grasslands, specially in shrubby areas.

Fls. & Frts. : August to October.

Specimen examined: Nyrthong 1332 Trongplong (Khasi Hills).

Malaxis latifolia Sm. in Rees Cyclop. 22: n. 3. 1812; Seidenfad. et Smitin. Orch. Thail. 146. t. 112. 1959; Tuyama in Hara, Fl. East. Himal. 444. 1966. - - Microstylis congesta(Lindl.) Reichb. f. in Walp. Ann. 6: 206. 1861; Hook.f. Fl. Brit. India 5: 689. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 19. t. 23. 1898.

Roots tufted. Stems 10-15 cm high, clothed with shining sheaths. Leaves 3-5, sessile or shortly petioled, ovate-elliptic,

acuminate, many-nerved, 10-15 x 4-5 cm, usually yellow, petioles sheathing. Scapes including racemes, 15-20 cm long, naked. Bracts scarious, 2.5 mm long. Flowers minute, 3 mm across, pinkish-green, Sepals and petals similar, 2.5 mm long, acute or obtuse. Lip broad, slightly longer than sepals and petals, apex shallowly retuse, 3-lobed, sidelobes obscure, incurved. Capsules 1.5 cm long, ribbed.

Common on road cuttings and secondary forests specially on slopes.

Fls. & Frts. : September to November.

Specimens examined: Myrchong 1970 Way to Baghmara (Garo Hills).

Microstylis Nutt.

Terrestrials. Stems pseudobulbous at base. Leaves few, plicate, continuous with their sheaths. Flowers small in terminal racemes. Sepals spreading, recurved, subequal, Petals narrower than sepals. Lip adnate to the base of column, 3-lobed, sidelobes large, sagittate or sometimes absent or cup-shaped with small lobules. Column short. Pollinia 4, ovoid or obovoid, waxy.

K E Y T O S P E C I E S

1a. Leaves pinkish-brown, margin wavy; lip convex, basal lobes sagittate . . . . . khasiana

1b. Leaves yellowish-green, margin not wavy; lip cup-shaped or hooded, basal lobes rounded . . . . . .maximowieziana

Microstylis khasiana Hook.f. Fl. Brit. India 5: 686. 1890.

Stems 5-8 cm high, developing from close pseudobulbs. Leaves few, ovate-elliptic, 10-15 x 2-3 cm, acute, margin wavy, usually with pinkish-green surface. Racemes longer than leaves. Bracts lanceolate, reflexed. Flowers 4 mm across. Sepals ovate, concave, dorsal sepals narrower, subacute, laterals broader. Petals linear, obtuse. Lip broader than sepals and petals, 3-lobed, sidelobes falcate, acute, midlobe constricted near the base of the sidelobes. Column clavate, triangular, at the apex. Capsules 1-1.5 cm long, obtusely angled.

Occasional in sedondary forests and in forest margins along old road cuttings. This species is similar to Malaxis acuminata but differs in having pinkish-green leaves with wavy margin, shorter pedicels, hooded sepals and concave, dilated lips.

Fls. & Frts. : September to November.

Specimens examined. Myrthong 1843 Mawsmai (Khasi Hills).

Microstylis maximowiezziana King et Pantl. in Journ. As. Soc. Bengal 64: 330.t. 2. 1895; et in Ann. roy. bot. Gard. Calc. 8: 21.t.26.1898.

Pseudobulbs clothed with ovate leaf-sheaths. Leaves 15-20 x 4-5 cm, ovate, oblong, or lanceolate, coriaceous, many-nerved, apex acute, base sheathing. Scapes 20-30 cm high, ribbed, slender, shining. Racemes 5-10 cm long, moderately dense-flowered. Flowers 1 cm across. Sepals and petals oblong, acute. Lip hooded, sidelobes short, obscure, midlobe retuse, clavate. Capsules 1-2 cm long, ribbed.

Occasional in grasslands, specially in marshes.

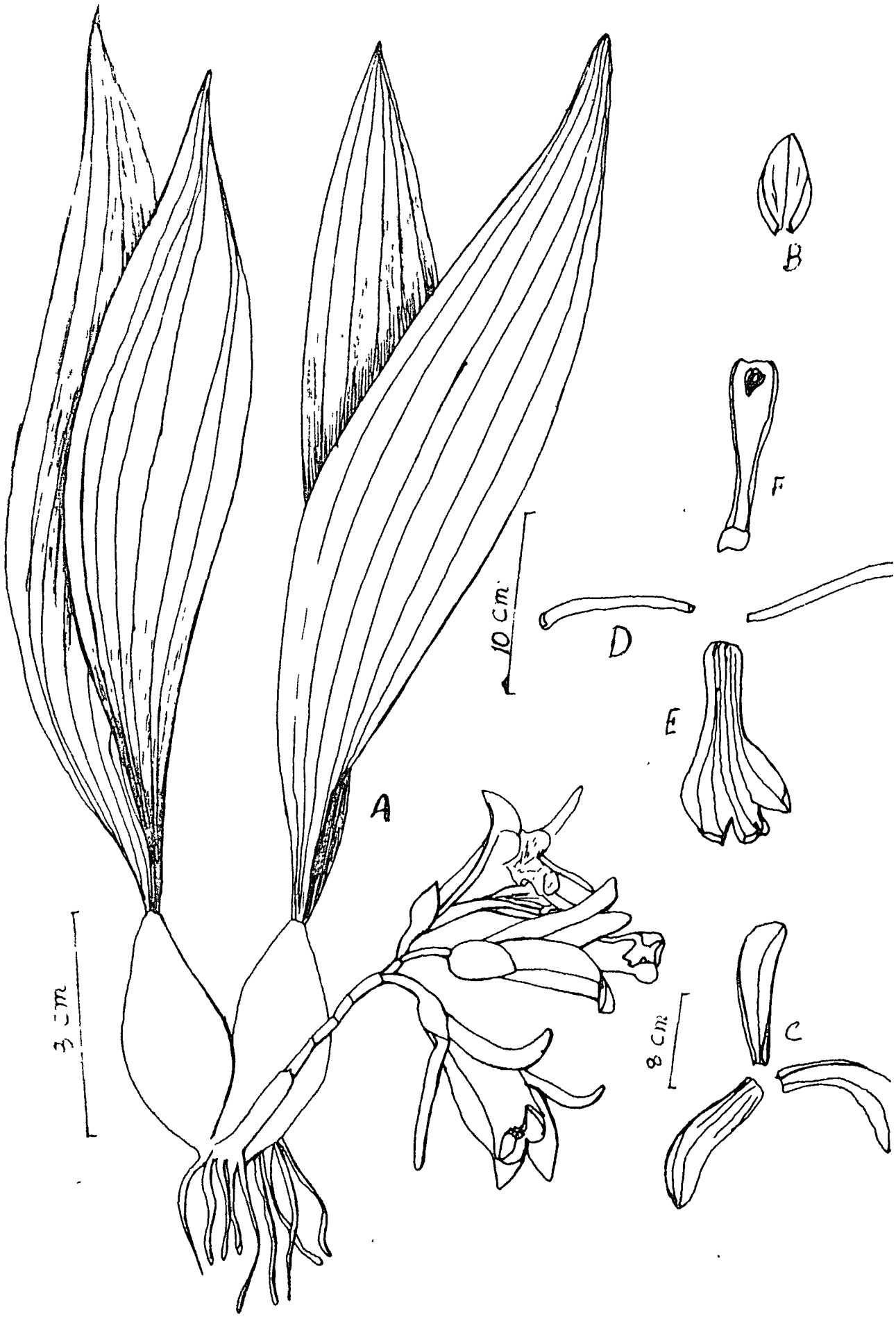


Plate 107 Neogyne gardneriana (Lindl.) Reichb.f. A. Habit B. Bracteole, C. Sepals, D. Petals, E. Labellum, F. Column.

Fls. & Frts. : September to November.

Specimens examined: Myrthong 1159 Mawmluh (Khasi Hills).

Neogyne Reichb.f.

Neogyne gardneriana (Lindl.) Reichb. f. in Bot. 2 cit. 10: 931. 1852. - Coelogyne gardneriana Lindl. in Wall. Pl. As. Rar. 1: 33. t. 38. 1829 (Plate 107).

Epiphytes or sometimes terrestrials. Pseudobulbs conical, 10-20 x 2-5 cm, green. Leaves 20-40 x 6-12 cm, plicate, lanceolate apex acute, Scapes short, embraced by large obtuse sheaths. Raceme few-flowered, embraced by large, straw coloured bracts. Flowers white or creamy, 3-4 cm across. Sepals 4-5 cm long, slightly spurred at base. Petals as long as sepals but slightly narrower. Lip 3-lobed, sidelobes crenulate, midlobe rounded, 2-toothed. Capsules 3-4 cm long, lanceolate, pointed at both ends. with distinct crests or wings.

Common on moss covered rocks and tree trunks.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1392 Jowai (Jaintia Hills), 2929 Burnihat (Khasi Hills).

Oberonia Lindl.

Epiphytic orchids with or without stems. Leaves distichous, ensiform, fleshy or coriaceous. Flowers minute,in dense spikes or racemes. Sepals subequal. Petals smaller than sepals. Lip usually 3-lobed. Column short, stout. Pollinia 4, united in pairs.

KEY TO SPECIES

1a. Leaves short, up to 4 cm long, distantly arranged, exposing the stems . . . . . mannii

1b. Leaves longer or shorter than above, densely crowded, concealing the stem.

2a. Leaves short, linear-oblong; flowers sessile, spirally arranged on stout axis . . . . dessima

2b. Leaves long, ensiform; flowers pedicelled or sessile. arranged in whorls on slender or stout axis.

3a. Lip distinctly 3-lobed, lobes dentate or crenate, flowers sessile, spirally aranged on axis; petals oblong, erose . . . . . iridifolia

3b. Lip entire or lobed, lobes entire; flowers otherwise; petals cuneate or lanceolate, not erose.

4a. Flowers sessile, densely imbricate; lip orbicular . . . . . pachyrachis

4b. Flowers pedicelled, whorled; lip otherwise . . . . myriantha

Oberonia dessima Lindl. Fol. Orch. Oberon. 4. 1859; Hook.f. Icon. Pl. t. 1785; et Fl. Brit. India 5: 680. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 9. t. 10. 1898; Seidenfad. & Smitin. Orch. Thail. 1(2): 157. 1959.

Leaves 3-4 x 1 cm, coriaceous, linear-oblong, acute, falcate. Scapes 3 cm long, erect or recurved, dense-flowered. Bracts 1.5 mm long, green, ovate, acute. Flowers minute, 1-2 mm across, greenish-yellow. Sepals entire, reflexed. Petals elliptic. obtuse. Lip 1 mm long, reddish, 3-lobed, sidelobes oblong, falcate midlobe quadrately orbicular, apex emarginate. Ovary 1 mm long. Capsules 2-4 mm long, ribbed.

Rare, reported only once from Pongtung forests.

Fls. & Frts. : August to October.

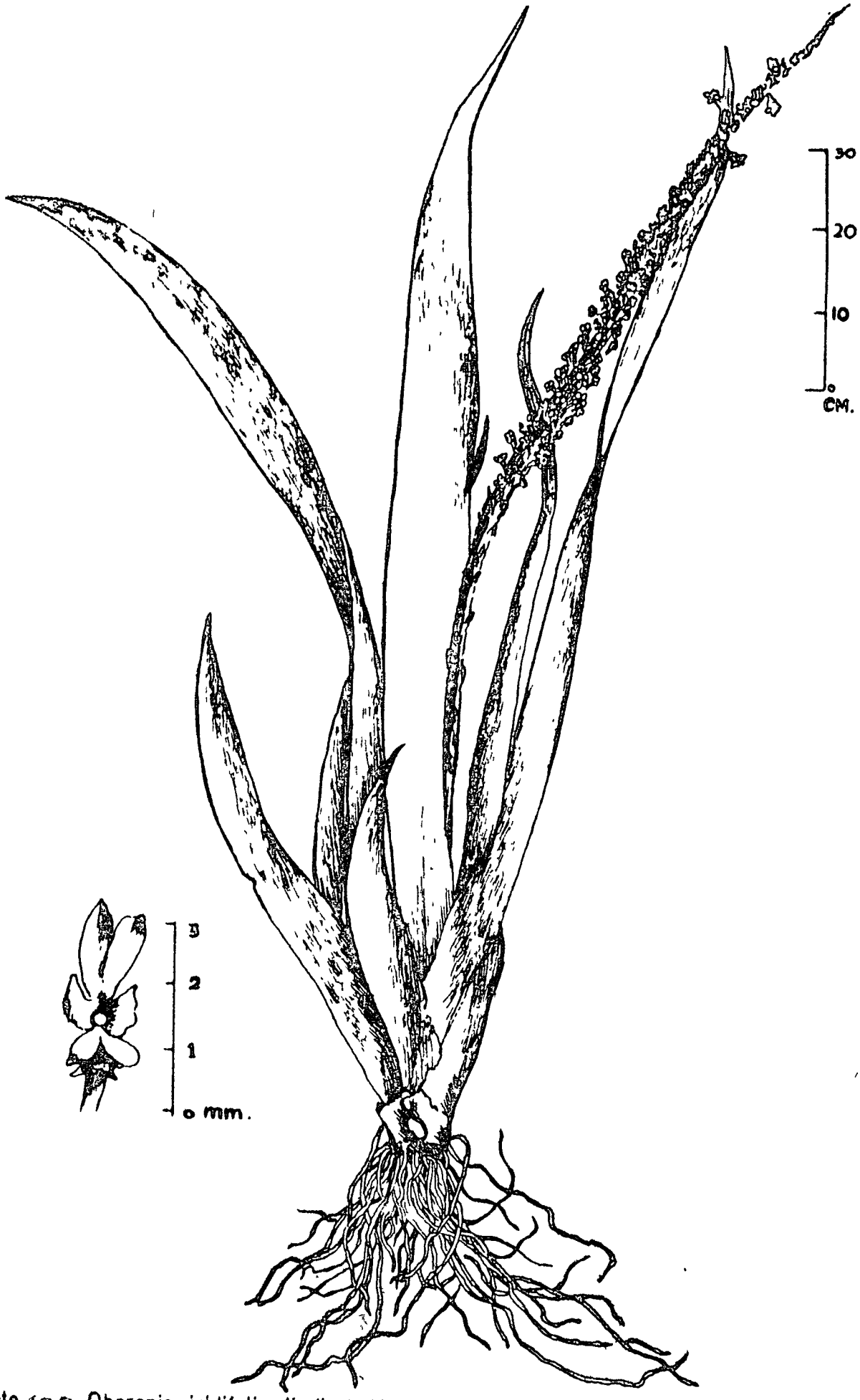


Plate 108 Oberonia iridifolia lindl. A. Habit, B. Flower.

Specimens examined: Rao 56756 Pongtung (Khasi Hills) (ASSAM).

Oberonia iridifolia (Roxb.) Lindl. Gen. Sp. Orch. 15. 1830; Hook.f. Fl. Brit. India 5: 675. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 8. t. 8. 1898; Tuyama in Hara, Fl. East. Himal. 445. 1966. - - Cymbidium iridifolium Roxb. (Hort. Beng. 63. 1814, nom. nud.) Fl. Ind. 3: 458. 1832. (Plate 108).

Leaves ensiform, distichous, 10-25 x 1-2 cm, acute, glandular all over. Flowers condensed in linear, 10-15 cm long, recurved spikes, white or yellow. Bracts small, membranous, less than 1 mm long. Sepals 1 mm long, membranous, ovate, cuneate. Petals slightly longer than sepals, Lip oblong, lanceolate, rounded at apex. Capsules including pedicels 8 mm long, clavate.

Common on tree-trunks in forests.

Fls. & Frts. : September to December.

Specimens examined: Myrthong 1387 Mawmluh (Khasi Hills).

Oberonia mannii Hook.f. Icon. Pl. t. 2003. 1889; et Fl. Brit. India 6: 180. 1890;

Leaves 2-4 x 0.4-0.5 cm, distichous, distantly arranged, exposing the stem. Racemes 2-8 cm long, dense-flowered. Flowers 3 mm across, white, shortly pedicelled. Bracts 1 mm long, green, persistent. Sepals ovate, greenish-white, obtuse. Petals similar to sepals. Lip 3-lobed, sidelobes decurved, erose, midlobe with minute lamellae in the sinus. Capsules 1.5-2 mm long, elliptic-oblong, obtusely ribbed.

Common on tree trunks in secondary forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2990 Shillong peak.

Oberonia myriantha Lindl. Fol. Orch. 4. 1859; Hook.f.Fl. Brit. India 5: 679. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 10. t. 12. 1898; Tuyama in Hara, Fl. East. Himal. 446. 1966.

Leaves distichous, ensiform, fleshy, acute, 15-20 x 1.5-2 cm, Scapes longer than leaves, erect or curved, dense-flowered. Bracts subulate, upper bracts shorter, ovate, Flowers whorled at the nodes of rachis, greenish-yellow, or white, 2 mm across. Sepals rounded, adnate at base. Petals similar to sepals. Lip 3-lobed, sidelobes rounded, crenate, midlobe orbicular. Capsules subelliptic.

Common on tree trunks in forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 1267 Nongstoin (Jaintia Hills).

Oberonia pachyrachis Reichb. f. ex Hook.f. Fl. Brit. India 5: 681. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 4. t. 3. 1898; Tuyama in Hara, Fl. East. Himal. 446. 1966.

Roots tufted. Leaves ensiform, 10-15 x 2-3 cm, broadened in the middle, fleshy, nerves distinct when dry. Racemes 8-15 cm long, dense-flowered, adnate to the uppermost leaf, recurved. Flowers imbricating, sessile, less than 1 mm across, embraced by persistent, membranous bracts. Sepals and petals narrow, minute. Lip concave at base. Capsules sessile, depressed.

Rare, on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2996 Shillong peak.

Ornithochilus Wall. ex Lindl.

Ornithochilus fuscus Wall. ex Lindl. Gen. Sp. Orch. 242. 1833; Hook.f. Fl. Brit. India 6: 76. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 200. t. 268. 1898; - - O. difformis (Wall.) Schltr. Orch. Sino-Jap. 277. 1919; Tuyama in Hara, Fl. East. Himal. 446. 1966.

Roots tuberous, tufted, 10-40 cm long. Stems short, 2-3 cm long. Leaves 5-7, lanceolate, obliquely acute. Racemes 20-30 cm long, branched. Flowers pink. Sepals 5-6 mm long. Petals as long as sepals but broader. Lip shorter than petals, oblong, crenate. Capsules 2-3 x 0.1-0.2 cm, linear, turbinate.

Common on tree trunks in forests, specially in lower elevation.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1927 Tura peak (Garo Hills).

Otochilus Lindl.

Epiphytic orchids. Stems pseudobulbous, articulated. Leaves 2, linear, elliptic or ovate, plicate. Flowers white, in racemes, or spikes. Sepals and petals subequal, spreading, free. Lip short, with 2-horned sac at base, terminal lobe deflexed. Column long, foot 0. Pollinia 4.

K E Y T O S P E C I E S

1a. Flowers large, dorsal sepals about 1.5 cm long; bracts ovate-lanceolate with triangular apex; epichile of lip ovate-lanceolate with 5-laminate keels at base of epichile, sidelobes of hypochile acute, or obliquely truncate with erose edges; rostellum beaked . . . . . porrectus

1b. Flowers small, dorsal sepals less than 1 cm long; bracts obovate with broad, obtuse apex; epichile of lip fasten to the ridges of hypochile or ridges absent; sidelobes of hypochile otherwise, rostellum not beaked.

2a. Leaves linear-lanceolate; edges of sidelobes of lip erose, united by transverse callus or ridge nearly closing the mouth of the hypochile . . fuscus

2b. Leaves ovate-lanceolate; sidelobes of lip not erose, without distinct callus or ridge.. albus

Otochilus albus Lindl. (in Wall. Cat. 1967. 1829) Gen. Sp. Orch. 35. 1830; Seidenfad. in Saetryk Bot. Tidsskrift 71: 10. t. 9. 1976.

Pseudobulbs articulated, chain-like, branched or not. Leaves lanceolate, usually 2, on terminal pseudobulbs. Racemes shorter than leaves, clothed at base by persistent bracts, few-flowered. Flowers white, 6 mm across. Sepals ovate-lanceolate, acute, obscurely 3-nerved, dorsal sepal cymbiform, broader. Petals smaller than sepals, ovate-lanceolate. Lip oblong, acute, sidelobes of hypochile finely papillous on the outside surface. Capsules lanceolate, ribbed.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 1862 Jowai (Jaintia Hills).

Otochilus fuscus Lindl. (in Wall. Cat. 1969. 1829) Gen. Sp. Orch. 35. 1830; Hook.f. Fl. Brit. India 5: 844. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 143. t. 199. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 163. 1975; Seidenfad. in Saertryk Bot. Tidsskrift 71: 8. t. 8. 1976.

Pseudobulbs stout, 2-5 cm long, clothed with sheaths. Leaves linear-lanceolate, 15-20 x 1-1.5 cm, base narrowed to a 1-2 cm long petiole. Scapes 10-15 cm long, slender. Racemes as long as, or shorter than scapes. Bracts obovate, apex obtuse. Flowers small, 3 mm across, pinkish-white. Sepals oblong, 5-6 mm long. Petals as long as sepals, slightly narrower. Lip concave, as long as petals. Column tinged with reddish-white. Pollinia 2, subglobose. Capsules 1 cm long, ribbed, pointed at both ends.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : August to December.

Specimens examined: Myrthong 1649 Shillong peak.

Otochilus porrectus Lindl. (in Wall. Cat. 1968. 1829) Gen. Sp. Orch. 36. 1830; Hook.f. Fl. Brit. India 5: 844. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 142. 198. 1898; Tuyama in Hara, Fl. East. Himal. 2 Rep. 192. 1971; Seidenfad. in Saertryk Bot. Tidsskrift 71: 10. 1976.

Pseudobulbs 3-8 cm long, subcylindric. Leaves 6-20 x 2-4 cm, lanceolate, strongly nerved, apex caudately acuminate, base

narrowed to a sheathing base, or flat petiole. Scapes shorter than leaves, decurved, moderately dense-flowered. Bracts deciduous. Flowers 8 mm across, pale yellow, or creamy. Sepals 5 mm long, linear, acute. Petals broader. Lip 3-lobed, sidelobes broad, rounded, midlobe lanceolate. Capsules lanceolate, obtusely ribbed.

Common on tree trunks in forests.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1663 Lailad (Khasi Hills).

Pantlingia Prain

Pantlingia serrata Deori in Bull. bot. Surv. India 20(1-4): 175. 1978.

Terrestrial saprophytic orchids. Rhizomes hairy. Stems 5 cm high, triquetrous, glabrous. Leaves solitary, reduced to bracts near the middle of the stem. Flowering bracts 3 mm long, ovate. Flowers 2 or more, pedicellate, in terminal racemes, yellow, blotched on the lip with purple. Sepals subequal, dorsal sepals linear, 4 mm long, lateral sepals as long as or shorter than dorsals. Petals 2.5 mm long, linear. Lip 3 mm long, obovate, serrate. Column 3 mm long, curved at apex. Pollinia 4, in pairs. Capsules 6-7 mm long, ribbed.

Rare, reported only from Shillong peak.

Fls. & Frts. : September to October.

Specimens examined: Deori 5126 Shillong peak.

Paphiopedilum Pfitz.

Terrestrials. Leaves radical, tufted, conduplicate in bud, elliptic or oblong. Flowers large, solitary or few. Sepals connate and placed below the lip. Petals free, variable. Lip sessile, 3-lobed, sidelobes small, spreading or inflexed, midlobe very large, slipper-shaped or saccate. Column short, terete. Stamens 2, anther lobes subglobose, contiguous. Pollinia granular. Ovary 1-celled or imperfectly 3-celled. Stigma discoid. Capsules 3-valved.

K E Y T O S P E C I E S

1a. Flowers 8-12 cm across; margin of petals straight or slightly undulate . . . . . insigne

1b. Flowers less than 8 cm across; margin of petals strongly undulate.

2a. Flowers hirsute; midlobe of lip purplish-green; staminode quadrate . . . . . hirsutissimum

2b. Flowers pubescent; midlobe of lip yellowish-green; staminode semilunar . . . . venustum

Paphiopedilum hirsutissimum (Lindl.) Pfitz. in Engl. Bot. Jahrb. 19: 41. 1894; Seidenfad. in Saertryk Bot. Tidsskrift 70: 64. 1975. - - Cypripedium hirsutissimum Lindl. Bot. Mag. 5. 4990. 1857.

Leaves 20-30 x 2-4 cm, linear-oblong, hairy. Scapes as long as leaves. Flowers greenish-yellow, hairy. Bracts ovate, acute. Sepals oblong, obtuse. Petals shorter than sepals, spathulate, margin crenulate. Lip saucer-shaped, midlobe purplish-green. Staminode quadrate. Capsules oblong, angled.

Rare, seen only under cultivation.

Fls. & Frts. · January to March.

Specimens examined: Deka 2285 Orchidarium, Botanical Survey of India, Shillong, (ASSAM).

Paphiopedilum insigne (Wall.) Pfitz. in Engl. Bot. Jahrb. 19:41. 1894. - -Cypripedium insigne Wall. in Lindl. Col. Bot.t. 32. 1821.

Leaves linear, acute, glabrous, base sheathing. Scapes shorter than or as long as leaves, 1-2-flowered. Bracts striate, 2-3 cm long, yellowish-white, acute. Flowers 8-12 cm across, pale yellowish-green with purple spots on the lip. Sepals subequal, dorsal sepal orbicular, laterals smaller. Petals as long as sepals, margin slightly wavy. Lip yellowish-green. Staminode hairy, truncate. Capsules cuneate, truncate, 3-valved.

Seen only under cultivation.

Fls. & Frts.: December to February.

Specimens examined: Myrthong 2940 Shillong.

Paphiopedilum venustum (Wall.) Pfitz. in Engl. Bot. Jahrb. 19: 41. 1894. - - Cypripedium venustum Sims in Curtis Bot. Mag. 47.t. 2129. 1820.

Leaves elliptic-oblong, 15-20 x 3-4 cm, Scapes 1-flowered, rarely 2, 10-20 cm long. Flowers 6 cm across. Sepals dark green with greyish-green spots. Petals linear-oblong, sparsely warted. Lip yellowish-brown, obtuse, midlobe subcylindric. Staminode semilunar. Capsules oblong or cuneate, slightly compressed.

Seen only under cultivation.

Fls. & Frts. : November to January.

Specimens examined: Deka (without No.) Orchidarium, Botanical Survey of India, Shillong (ASSAM).

Peristylus Bl.

Terrestrials. Leaves usually crowded in the middle or at the base of the scapes. Flowers lax or dense, terminal on spikes. Sepals and petals free, subsimilar, petals fleshy. Lip short, lobed. Spurs long, slender. Anthers 2-celled; pollinia granular, rostellum subulate or tooth-like between the anther cells. Capsules erect, close to the rachis.

K E Y T O S P E C I E S

1a. Lip divided into hypochile and epichile by a transverse ridge; sidelobes longer than midlobe.

2a. Leaves lanceolate, crowded at the middle of the stem; spur about twice as long as dorsal sepals . . . . . gracilis

2b. Leaves otherwise; spur as long as or shorter than dorsal sepals.

3a. Spur slender, cylindrical, acute; petals much broader than lateral sepals . . . . . densus

3b. Spur clavate, slightly 2-fid at apex; petals equal to or narrower than lateral sepals.

4a. Leaves subradical, usually 2; spur globular, shorter than dorsal sepal . . . . . tentaculatus

4b. Leaves not radical, more than 2; spur clavate, or fusiform, much longer than dorsal sepal . . .... tipuliferus

1b. Lip not divided into hypochile and epichile; sidelobes if lip shorter than midlobe.

5a. Lip with a higher or lower rounded callus on disc.

6a. Flowers greenish-white; dorsal sepals 4 mm long; sidelobes narrower than midlobe . . lacertiferus

6b. Flowers pure white; dorsal sepals more than 5 mm long; sidelobes broader than midlobe. . . candidus

5b. Lip without calli.

7a. Leaves grass-like, linear. . . . . mannii

7b. Leaves lanceolate to ovate, not grass-like.

8a. Plants robust; leaves crowded in the middle of the stem; lateral sepals obliquely spreading, with strong inrolled edges; petals much broader than lateral sepals . . . . . goodyeroides

8b. Plants slender; leaves crowded or not in the middle of the stem; lateral sepals not as above; petals slightly broader than sepals . prainii

Peristylus candidus J.J. Sm. Fl. Buitnz. 6: 36. t. 18. 1905; Seidenfad. in Dansk Bot. Ark. 31(3): 60. t. 30. 1977.

Roots few, hairy. Stems short, clothed with clavate sheaths. Leaves 2-3, subradical, lanceolate, 4-8 x 2-3 cm, acute, many-nerved. Scapes 20-40 cm high, jointed with leafy bracts at the nodes. Flowering bracts 1 cm long, cymbiform, green. Flowers 4 mm across, green. Sepals 2 mm long, dorsal sepals ovate, longer

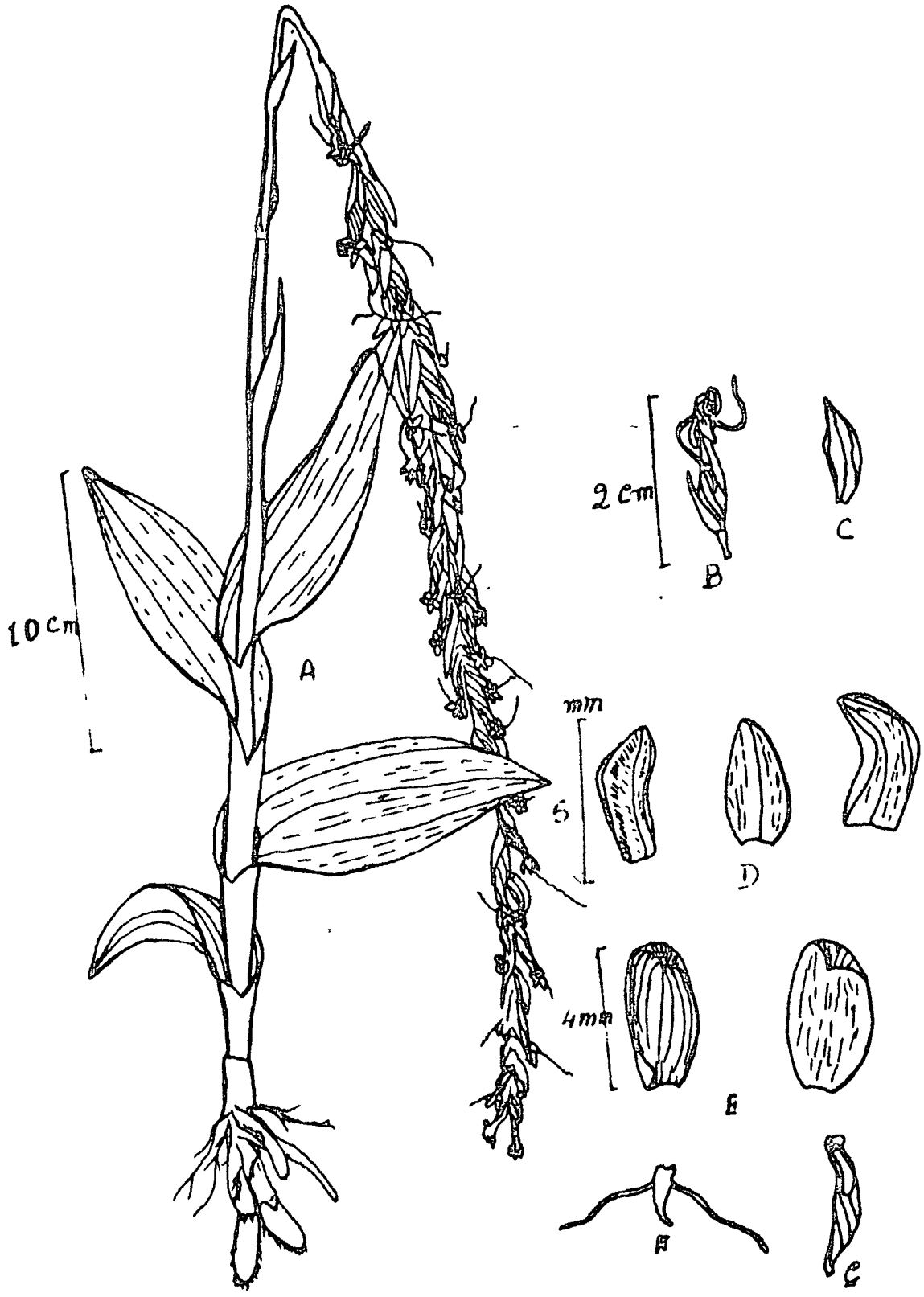


Plate 109 Peristylus densus (Lindl.,) Santap. & Dapad. A. Habit, B. Flower, C. Bracteole, D. Sepals E. Petals, F. Labellum, G. Column and spur.

than laterals. Petals similar to lateral sepals, obliquely acuminate. Lip 3-lobed, sidelobes rounded, 1 mm long, midlobe as long as sidelobes but smaller, hooded. Capsules 1 cm long, ribbed, narrowed at both ends.

Common on old walls , specially on wet soil covered rocks. Associated with ferns and other herbaceous plants.

Fls. & Frts. : September to October.

Specimens examined: Lyrthong 3052 Shillong peak.

Peristylus densus (Lindl.) Sant. & Kapad. in Journ. Bombay nat. Hist. Soc. 57: 128. 1960; Seidenfad. in Dansk Bot. Ark. 31(3): 32. 12. 1977. - - Habenaria densa Wall. ex Lindl. Gen. Sp. Orch. 320. 1835; Hook.f. Fl. Brit. India 6: 153. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 319. t. 420. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 149. 1975.(Plate 109).

Stems 30-40 cm high, leafy. Leaves cauline, 6-10 x 1-2 cm, lanceolate, few basal and upper leaves reduced to sheaths. Racemes dense-flowered, 10-20 cm long. Bracts 1.5 cm long, acute, longer than ovary, twisted. Sepals 3-4 mm long, acute, green. Petals ovate, as long as sepals but broader, Lip 3-lobed, sidelobes subulate, midlobe shorter than sidelobes. Spur 1 cm long, straight, directed downwards along the ovary. Capsules 2 cm long, fusiform.

Common in secondary forests and scrub jungles. Associated with grasses and other herbaceous plants.

Fls. & Frts. : August to October.

Specimens examined: Lyrthong 1834 Shillong, 1876 Mawsmai, (Khasi Hills); 3038 Baghmara, 3039 Rongjeng (Garo Hills).

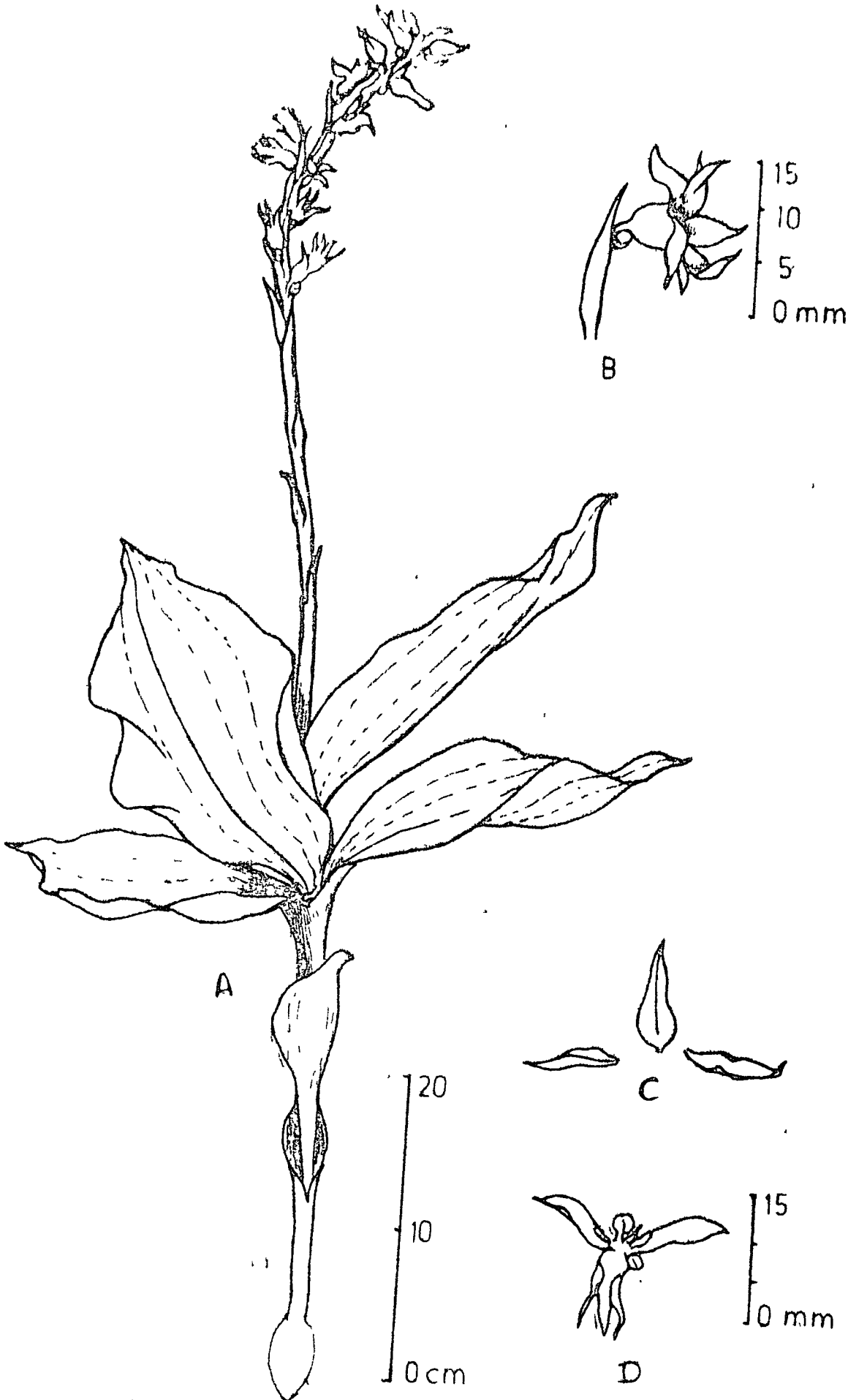


Plate 110 Peristylus goodyeroides (D.Don) Lindl. A. Habit, B. Flower, C. Sepals, D. Flower after removal of sepals.

Peristylus goodyeroides (D.Don) Lindl. Gen. Sp. Orch. 299. 1835; Seidenfad. in Dansk Bot. Ark. 31(3): 54. t. 25. 1977. - - Habenaria goodyeroides D. Don Prodr. 25. 1810; Hook.f. Fl. Brit. India 6: 161. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 326. t. 430. 1898; Tuyama in Hara, Fl. East. Himal. 3 Rep. 150. 1975.(Plate 110).

Stems robust, 30-40 cm high. Leaves crowded in the middle of the stem, lower and upper leaves reduced to sheaths, blades 10-16 x 4-6 cm, ovate-lanceolate. Racemes sparse-flowered. Flowers subsecund, white, 5 mm across, bracts as long as or shorter than ovary. Sepals small, green, 4 mm long. Petals broader, obtuse. Lip 3-lobed, sidelobes slightly smaller than midlobe. Column rounded, or circular. Capsules fusiform, 1-1.5 cm long.

Common in denser forests.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 1939 Nawmluh, 1751 Lailad (Khasi Hills).

Peristylus gracilis Bl. Bijdr. 404. 1825; Seidenfad. & Smitin. Orch. Thail. 1, 47. 1959; Seidenfad. in Dansk Bot. Ark. 31(3): 30. t. 11. 1977.

Stems leafy, 10-40 cm high. Leaves few, near the middle of the stems, lanceolate, 2-10 x 2-3 cm, lower and upper leaves reduced. Racemes up to 10 cm long, lax-flowered. Bracts ovate, acute, shorter than the pedicellate ovary. Flowers 8 mm across, green. Sepals subequal, lateral sepals oblong, 4 mm long, dorsal sepals ovate, 3 mm long. Petals erect, triangular, 1-nerved, 4 mm

long. Lip 3-lobed, sidelobes long, filiform, usually twisted near the apex, midlobe obtuse, 2-3 mm long. Column shorter than sepals and petals. Pedicels including ovary 7-8 mm long.

Occasional in grasslands and in secondary forests.

Fls. & Frts. : August to September.

Specimens examined: Deori 51742 Jarain (Jaintia Hills), (ASSAM).

Peristylus lacertiferus (Lindl.) J.J. Sm. in Bull. Buitenz. 3. n.s. 23. 1927; Seidenfad. in Dansk Bot. Ark. 31(3): 58. t. 29. 1977.- - Coeloglossum lacertiferum Lindl. Gen. Sp. Orch. 302. 1835.

Stems short. Leaves usually 2, opposite, radical, ovate, acute, 1-2.5 x 1.5 cm, sessile. Scapes 6-10 cm long, few-flowered. Flowers 6-8 mm across, green. Sepals subequal, 4 mm long, 1-nerved. Petals slightly longer than sepals, but narrower. Lip 3-lobed, sidelobes filiform, longer than sepals, midlobe shorter than sidelobes. Capsules 1 cm long, fusiform, turbinate.

Frequent in grasslands.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2991 Shillong.

Peristylus mannii (Reichb.f.) Mukerjee in Notes bot. Gard. Edinb. 21, 3: 153. 1953; Seidenfad. in Dans Bot. Ark. 31(3): 45. t. 19. 1977.- - Coeloglossum mannii Reichb. in Linaea 41: 54. 1877. - - Habenaria gracillima Hook.f. Fl. Brit. India 6: 163. 1890.

Roots fleshy, fasciculated. Stems weak, undulate, green, 20-40 cm high. Leaves few, 1-3, usually 1-2 largest, linear, 6-10 x

0.3-0.5 cm, Racemes 10-20 cm long, few-flowered. Flowers green, 3 mm across. Bracts scarious, 1.5-2 mm long. Sepals 1.5 mm long. Petals equalling sepals. Lip 3-lobed, sidelobes linear, midlobe slightly longer than sidelobes. Capsules 6 mm long, subtwisted.

Common in grasslands.

Fls. & Frts. : September to October.

Specimens examined: Jutika Datta 8 Shillong peak (NEHU).

Peristylus prainii (Hook.f.) Krzl. Orch. Gen. Sp. 514. 1901; Seidenfad. in Dansk Bot. Ark. 31(3): 48. t. 22. 1977. - - Habenaria prainii Hook.f. Fl. Brit. India 6: 159. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 329. t. 431. 1898.

Leaves 4-5, crowded below the middle of scapes, ovate, uppermost one longer, 5-6 x 2-2.5 cm, pale green, sheathing at base. Scapes including spikes up to 30 cm long, jointed with bract at each node, flowering bracts 4-10 mm long, linear, as long as, or shorter than ovary. Flowers 5-6 mm across, green. Sepals 2-3 mm long. Petals similar to sepals. Lip 3-lobed, subequal. Spur elliptic, 2 mm long. Ovary linear, 1 cm long.

Common on limestone areas, associated with other ground vegetation.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 1898 Mawsmai Cave (Khasi Hills).

Peristylus tentaculatus (Lindl.) J.J. Sm. Fl. Buitenz. 6: 35. 1905; Seidenfad. in Dansk Bot. Ark. 31(3): 41. t. 18. 1977. Glossula tentaculata Lindl. Bot. Reg. 10. t. 862. 1825.- - Habenaria tentaculata (Lindl.) Reichb.f. Otia Bot. Hamb. 34.1878.

Roots tuberous. Leaves 2-3, subradical, 3-5 x 2-4 cm, ovate, acute, sessile, sheathing. Scapes 15-30 cm long, clothed with bracts at the nodes. Racemes dense-flowered. Flowering bracts shorter than slender ovary. Flowers green, 6 mm across. Sepals ovate, acute, 2 mm long. Petals similar to sepals. Lip 3-lobed, sidelobes filiform, 1.5 cm long, erect, midlobe 1 mm long, reflexed, parallel to the clavate spur, spur with a longitudinal depression, as long as lip, adpressed to the ovary. Column short, Capsules suberect, ribbed.

Occasional in grasslands, associated with grasses and sedges.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 1085 Mylliem (Khasi Hills).

Peristylus tipuliferus (Par. & Reichb.f.) Mukerjee Notes Bot. Gard. Edinb. 21: 158. 1953; Seidenfad. in Dansk Bot. Ark. 31(3): 41. t. 17. 1977. - - Habenaria tipulifera Par.& Reichb.f. in Trans. Linn. Soc. 30: 139. 1874; - - H. brandisii Hook.f. Fl. Brit. India 6: 162. 1890.

Roots fleshy. Stems slender, 10-20 cm long, clothed with membranous sheaths at nodes. Leaves 3-5, alternate, 5-10 x 1-2.5 cm, linear-lanceolate, acute, sheathing. Scapes 15-30 cm long, moderately dense-flowered, towards the apex. Bracts ovate, 0.6-1.2 cm long, filiform at apex. Ovary shorter than bracts. Flowers 5 mm across, green. Sepals and petals subsimilar, ovate. Lip 3-lobed, sidelobes filiform, 8 mm long, midlobe 1.5 mm long, cuneate. Spur clavate, 2-grooved. Capsules 1.5 cm long.

Common in pine and sparse, broad leaved forests, on old walls and road cuttings, associated with grasses and other herbaceous vegetation.

Fls. & Frts. : July to September.

Specimens examined: Myrthong 3039 Shillong peak.

Phajus Lour.

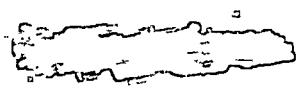
Phajus longipes (Hook.f.) Holtt. in Gard. Bull. 11: 286. 1947. - - Calanthe longipes Hook.f. Fl. Brit. India 6: 195. 1890.

Stems jointed, clothed with green sheaths. Leaves plicate, 20-30 x 4-6 cm, lanceolate, acute, narrowed to a channelled petiole, green, turning black when dry, nerves 5-7, distinct. Scapes axillary, 30-60 cm long, sheathing at each node. Flowers green, congested towards the apex of the axis. Bracts linear, 2-4 cm long, acute, deciduous. Pedicels up to 1 cm long, slender. Sepals 1-1.5 cm long, subequal, brownish-green. Petals equalling sepals. Lip shorter than sepals and petals, sidelobes and midlobe undulate, hairy, rounded. Spur 0. Capsules 1-2 cm long, green, obtusely ribbed.

Common in dense forests, on slopes and moss covered rocks, associated with herbaceous vegetation.

Fls. & Frts. : April to October.

Specimens examined: Myrthong 1217 Mawmluh (Khasi Hills).



Phalaenopsis Bl.

Phalaenopsis parishii Reichb. f. in Gard. Chron. 410. 1874; Hook.f. Fl. Brit. India 6: 31. 1890.

Roots tufted, flat, up to 6 mm across. Stems stout, very short. Leaves ovate-oblong, 5-20 x 3-5 cm, base narrowed to a short, channelled petiole, apex acuminate. Scapes lateral, 6-10 cm long, few-flowered. Flowers small, white, 2.5 mm across. Sepals and petals obovate. Lip white, sidelobes falcate, midlobe cordate, disk with 4 lobules or lamellae. Capsules 6-8 mm long, ribbed.

Rare, on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : August to September.

Specimens examined: Myrthong 2976 Jowai (Jaintia Hills).

Pholidota Lindl.

Epiphytes. Leaves 2, or rarely 1. Flowers small, in long pendulous racemes, bracts persistent, large. Sepals subequal, concave. Petals similar to sepals. Lip sessile, adnate to the base of column, saccate. Column short with wide wings. Pollinia 4, free or connate in pairs. Capsules globose.

K E Y T O S P E C I E S

1a. Pseudobulbs chain-like, articulated, branched . . articulata

1b. Pseudobulbs solitary, not articulated,

2a. Leaves large 5-15 cm across; spikes denuded . . pallida

2b. Leaves less than above; spikes erect.

3a. Dorsal sepals oblong; lip cymbiform, sidelobes obscure, rounded . . . . . calceata

3b. Dorsal sepals ovate; lip ovate, orbicular; sidelobes subacute, distinct . . . . . convallarieae

Pholidota articulata Lindl. var. griffithii (Hook.f.) King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 146. t. 204. 1898. - - P. griffithii Hook.f. Icon. Pl. t. 1811. 1889; et Fl. Brit. India 5: 845. 1890; Tuyama in Hara, Fl. East. Himal. 3 Rep. 163. 1975.

Pseudobulbs articulated, 4-12 cm long, chain-like. Leaves usually 2, oblong-lanceolate, many-nerved, petiole short, channelled. Racemes 6-10 cm long, erect or decurved. Bracts alternate, 3-5 mm apart, oblong, obtuse, persistent. Flowers pink, 1 cm across. Sepals subequal, dorsal sepal suborbicular, laterals ovate, 6 mm long. Petals as long as sepals, ovate-orbicular. Lip rounded, as long as sepals, midlobe subulate, Column short, suborbicular. Capsules 1-1.5 cm long, ribbed.

Common on tree trunks and on moss covered rocks in dense forests.

Fls. & Frts. : April to December.

Specimens examined. Myrthong 1862 Shillong peak, 1938 Mawsmai (Khasi Hills); 3020 Jowai (Jaintia Hills).

Pholidota calceata Reichb.f. in Walp. Ann. 6: 238. 1861; Hook.f. Fl. Brit. India 5: 846. 1890.

Rhizomes stout. Pseudobulbs crowded, 3-4 cm long, subcylindric, 2-leaved, 1 deciduous and apparently 1-leaved. Leaves plicate, 10-12 x 2 cm, linear-lanceolate, base narrowed to a 1-2 cm long petiole. Scapes 15 cm long, dense-flowered. Bracts 5 mm long, rounded, persistent. Pedicels 4-5 mm long. Sepals and petals 3-4 mm long. Lip 3-lobed, sidelobes subulate, midlobe

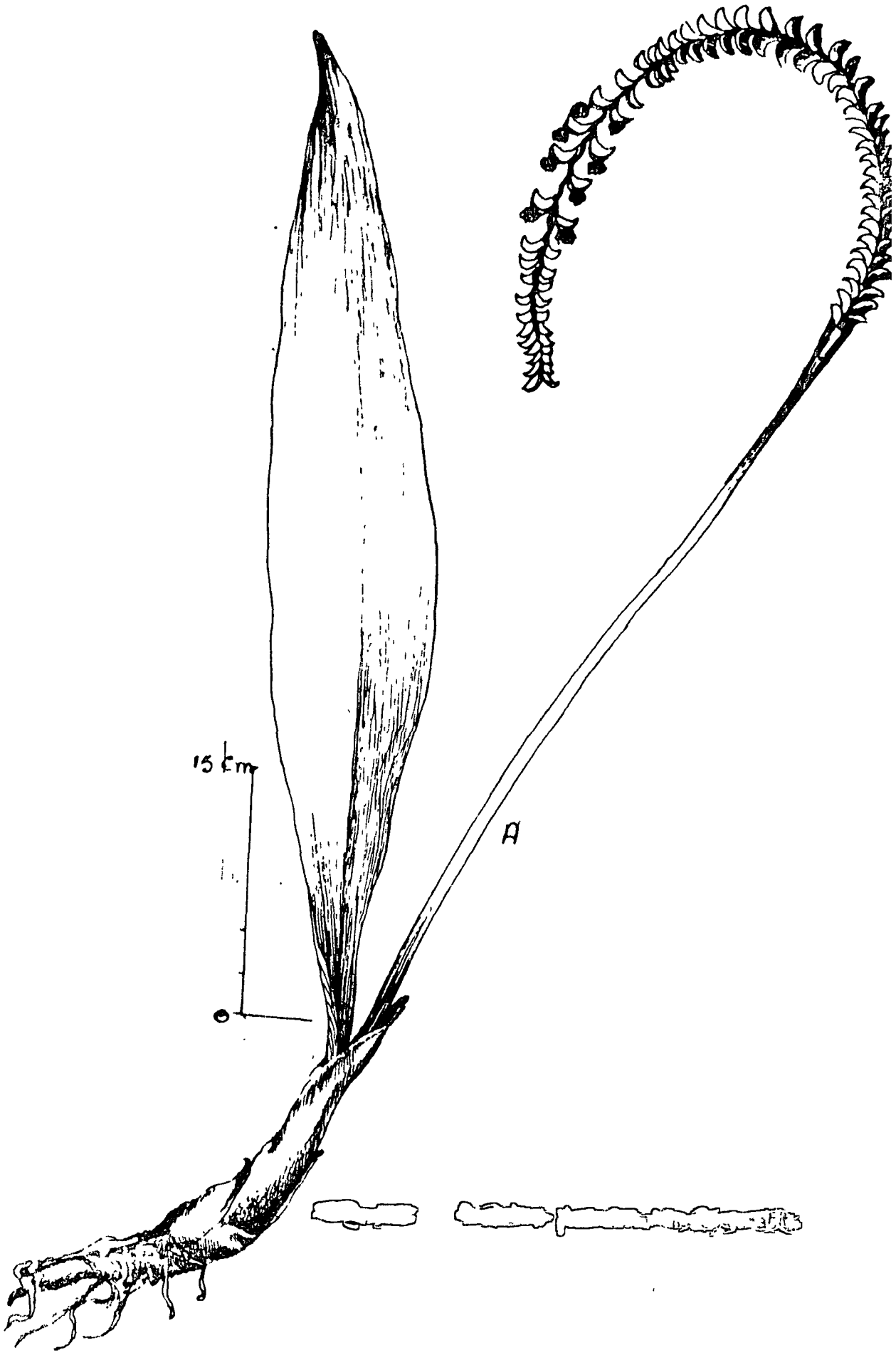


Plate 111. Pholidota pallida Lindl. A. Habit.

with terminal auricle-like crest. Column subtriangular at the apex. yellowish-brown. Capsules ribbed, 0.6-1 cm long.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 3033 Mawmluh (Khasi Hills).

Pholidota convallariae Hook.f. Icon. Pl. t. 1880. 1889; et Fl. Brit. India 5: 846. 1890.

Rhizomes stout, rooting on one side. Pseudobulbs short, distant, sessile, subcylindric, 1-2-leaved. Leaves 10-15 x 2-2.5 cm, oblong, base narrowed to a 3-5 cm long petiole, apex rounded. Scapes as long as or shorter than leaves, moderately dense-flowered, sheathed at base with bracts. Flowers pinkish-white, 4-6 mm across. Sepals subequal, lateral sepals acute, dorsal sepals oblong, 5-nerved. Petals obtuse, broad, 3-nerved. Lip suborbicular, 3-nerved, emarginate at tip. Capsules elliptic, 8 x 6 mm, ribbed.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1604 Nongpoh (Khasi Hills).

Pholidota pallida Lindl. Bot. Reg. sub. t. 1777. 1836; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 144. t. 201. 1898; P. imbricata Sensu Lindl. Bot. Reg. t. 1213. non Lindl. in Hook. f. Exot. Fl. pt. 138. 1825; Hook.f. Fl. Brit. India 5: 845. 1890; Tuyama in Hara, Fl. East. Himal. 447. 1966, et in 2 Rep. 163. 1971.

Pseudobulbs 4-10 cm long, narrowed towards the apex or subclavate. Leaf solitary, 20-45 x 4-12 cm, plicate, base narrowed to a sheathing petiole. Racemes dense-flowered, recurved. Bracts distichous, 5-8 mm long, obtuse, straw-coluured. Sepals orbicular, connate at base. Petals similar to sepals, linear-acute, much smaller than sepals. Lip broad, rounded with large sidelobes and small midlobe. Column winged in the upper half. Capsules 1.5-2 cm long, ribbed.

Common on tree trunks and moss covered rocks in forests.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 1219 Jowai (Jaintia Hills); 1367 Nongpoh (Khasi Hills).

Phreatia Lindl.

Phreatia elegans Lindl.Gen. Sp. Orch. 63. 1830; Hook.f. Fl. Brit. India 5: 810. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 251. t. 333. 1898.

Epiphytes. Pseudobulbs slender, clothed with sheaths. Leaves lanceolate, oblong, 15-25 x 1.5-3 cm, acute, base narrowed to a sheathing petiole. Scapes longer than leaves, many-flowered. Bracts ovate, 2 cm long. Flowers white. Sepals acute, laterals obliquely adherent to the column. Petals as long as sepals but narrower. Lip broad, entire, fleshy, decurved, adnate to the foot of column. Pollinia 8, attached to narrow caudicle.

Occasional on tree trunks in dense forests.

Fls. & Frts. : August to October.

Specimens examined: Panigrahi 3725, 28956 Cherra (Khasi Hills), (ASSAM).

Platanthera L. C. Rich.

Platanthera susannae (Linn.) Lindl. Gen. Sp. Orch. 295. 1835. - - Orchis susannae Linn. Sp. Pl. 939. 1753. - - Habenaria susannae (Linn.) R. Br. ex Spreng. Syst. Veg. 3: 622. 1826; Hook. f. Fl. Brit. India 6: 137. 1890.

Terrestrials. Stems leafy, up to 50 cm high. Flowers terminal, few, 1-3, white, 8 cm across. Sepals spreading, subequal, lateral sepals oblong, obtuse, dorsal sepal rhomboid. Petals small, linear, acute. Lip shorter than sepals, 3-lobed, sidelobes truncate, midlobe dilated downwards. Spur very long, much longer than ovary. Capsules 2-5 cm long, ribbed.

Rare, in secondary forests, associated with herbaceous plants.

Fls. & Frts. : August to October.

Specimens examined: Sherma 23183 Umsaw (Khasi Hills).

Pleione D. Don

Terrestrials or epiphytes. Pseudobulbs ovoid, usually spotted brown or violet. Leaves plicate, deciduous, appearing after flowering. Flowers 1-3, white or pinkish-purple. Sepals valvate, free or connate at base. Petals ovate-acute, smaller than sepals. Lip lobed or not, margin dentate, shortly spurred. Anthers with short filaments. Pollinia 4.

K E Y T O S P E C I E S

1a. Flowers pinkish-white or purple; lip papillose . praecox
1b. Flowers white; lip not papillose . . . . . maculata

Pleione maculata Lindl. et Paxt. in Paxt. Fl. Gard. 2: 5. t. 39. 1851; Tuyama in Hara, Fl. East. Himal. 2 Rep. 194. 1971. - - Coelogyne maculata Lindl. Gen. Sp. Orch. 43. 1830; Hook.f. Fl. Brit. India 5: 841. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 140. t. 195. 1898; Seidenfad. & Smitin. Orch. Thail. 133. t. 100. 1959.

Epiphytic or terrestrial orchids. Pseudobulbs conic, green or variegated, fleshy, clothed with dry fibrous scales. Leaves plicate, lanceolate, 15-20 x 4-5 cm, many-nerved, acute, base narrowed to a petiole. Scapes 2-5 cm long, 1-(rarely 2) flowered. Flowers white. Sepals and petals subequal, cuneate, spreading, 2-2.5 cm long. Lip rounded, with purple streak within. Column short, truncate, fleshy. Capsules elliptic-oblong.

Common on moss covered rocks and on tree trunks in forests. This species is very similar to Pleione praecox excepting for the white flowers.

Fls. & Frts. : October to November.

Specimens examined: Lyrthong 3082 Mawsmai (Khasi Hills).

Pleione praecox (Sm.) D. Don Prodr. Fl. Nepal. 37. 1825; Tuyama in Hara, Fl. East. Himal. 449. 1966. - - Coelogyne praecox Lindl. Col. Bot. 37. 1821; Hook.f. Fl. Brit. India 5: 840. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 141. t. 196. 1898.

Terrestrial or epiphytic orchids. Pseudobulbs green, violet spotted, bottle-shaped. Leaves 2, 20-30 x 4-5 cm, lanceolate, plicate, acute, many-nerved, base narrowed to petiole. Peduncles

4-10 cm long. Flowers pinkish-white, 6 cm across. Sepals 3-4 cm long, cuneate or oblong, 5-nerved, acute. Petals equalling sepals. Lip 2-lobed, 2 cm across, deep pink within and pale pink without. Capsules oblong, obtusely ribbed.

Common on tree trunks and on moss covered rocks in forests.

Fls. & Frts. : August to January.

Specimens examined: Myrthong 3032 Barapani (Khasi Hills).

Podochilus Bl.

Slender epiphytic orchids. Leaves equitant, distichous, small, fleshy or leathery. Flowers small, in leaf opposed racemes or spikes. Sepals connate at base forming a sac or mentum. Lip clawed. Rostellum triangular, 2-fid. Pollinia 4. Capsules minute.

K E Y T O S P E C I E S

1a. Stems completely clothed with equitant, distichous leaves; lip cureately oblong, truncate . . cultratus

1b. Stems not as above; lip narrowly oblong, emarginate . . . . . khasianus

Podochilus cultratus Lindl. Gen. Sp. Orch. 234. 1835; Hook.f. Fl. Brit. India 6: 80. 1890; King et Pantl. in Ann. roy. bot. Gard Calc. 8: 245. t. 326. 1898.

Stems tufted, usually proliferous, clothed with small, distichous leaves from base to apex, 5-15 cm long. Leaves equitant, 0.6-1 x 0.4-0.5 cm, compressed, acute, basal and apical leaves shorter. Flowers minute, terminal, 1.5-2 mm across, Sepals 5-nerved. Petals obovate, acute, 3-nerved. Lip broad, as long as sepals, clawed. Capsules 6 mm long, ribbed.

Rare, on tree trunks and moss covered rocks in deep forests.

Fls. & Frts. : April to July.

Specimens examined: Myrthong 2973 Jowai (Jaintia Hills).

Podochilus khasianus Hook.f. Icon. Pl. 1889; et Fl. Brit. India 6: 81. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 246. t. 327. 1898.

Stems tufted, 10-20 cm long, leafy all over. Leaves alternate, subdistichously arranged from base upwards, 1-1.5 x 0.1-0.2 cm, acute, articulating with the sheaths, blades usually twisted. Flowers few, in small terminal head, or on short peduncles, shorter than leaves, 4-5 mm across. Bracts strongly-nerved. Sepals acute, nerved, 3-4 mm long. Petals 1-nerved, oblong, obtuse. Lip shorter than sepals and petals, obscurely lobed. Capsules 8 mm long, cuneate.

Rare, collected only once from Pynursla; on tree trunks in secondary forests.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 3254 Pynursla (Khasi Hills).

Pomatocalpa Kuhl & Hasselt ex Reichb.f.

Pomatocalpa ramosum (Lindl.) Summerh. in Kew Bull. 56: 1948. - - Saccolabium ramosum Lindl. Gen. Sp. Orch. 224. 1833. Cleisostoma ramosum (Lindl.) Hook.f. Fl. Brit. India 6: 72. 1890.

Roots tufted. Stems slightly twisted or curved, short. Leaves 10-20 x 1-2 cm, apex unequally lobed or primose. Racemes branched, branches 5-15 cm long. Flowers stellate, 6-8 mm across,

yellow. Sepals unequal, dorsal sepal 3 mm long, spathulate, laterals broader. Petals spathulate, 3 mm long, obtuse, 1-nerved. Lip 3-lobed, white, sidelobes subulate, midlobe ovate, disk hairy at the base. Spur white. Capsules fusiform or oblong.

Rare, collected only once from Jowai.

Fls. & Frts. : October to November.

Specimens examined: *Myrthong* 3145 Jowai (Jaintia Hills).

Porpax Lindl.

Porpax gigantea Deori in Bull. bot. Surv. India 17(1-4): 174. 1975.

Epiphytes. Pseudobalbs depressed, crowded, reticulate, pale rose coloured. Leaves appear before flowers, 3-5 x 2-3 cm, ovate,oblong, or ovate-lanceolate, hairy on both surfaces, sheathing, apex acute or retuse. Scapes 5 mm long. Bracts 5-6 mm long, ovate, apiculate, longer than ovary. Flowers 2, reddish-brown, hairy outside. Sepals united forming a tubular calyx tube, apices mucronate. Petals 1 cm long, red, obliquely spathulate, acute. Lip 4 mm long, falcate, 3-lobed, yellow, sidelobes laciniate, midlobe hairy, oblong, Pollinia 8, equal, free, 4 in each cells Capsules hairy.

Rare, reported only once from Jarain.

Fls. & Frts. : July to September.

Specimens examined: Deori 51757 Jarain (Jaintia Hills) (ASSAM).

Renanthera Lour.

Renanthera bilinguis Reichb.f. Xen. Orch. 1: 7. t. 4. 1855. - - Arachnanthe bilinguis Benth. in Gen. Pl. 3: 573.1883; Hook.f. Fl. Brit. India 6: 28. 1890.

Epiphytes. Roots stout, 5-6 mm across. Stems woody, curved, clothed with old leaf-sheaths, 10-30 cm long. Leaves subdistichous with overlapping base, 20-30 x 2.5-3 cm, subcoriaceous, linear-oblong, apex unequally notched, lobes rounded, base broad, channelled. Peduncles as long as, or shorter than leaves, few-flowered, clothed with brown membranous sheaths at nodes. Flowering bracts 4-6 mm long, ovate. Pedicels 2-3 cm long, stout. Flowers 3 cm across, greenish-yellow, with brown spots all over the segments. Lateral sepals 1.8-2 x 0.4 cm, oblong, reflexed at apex, with many brown-violet spots on edges and in the centre, dorsal sepals as long as laterals, apex incurved with a hum at the back. Petals oblong, shorter than sepals. Lip subulate, sagittate at base. Column short, stout, 3-4 mm long, truncate, cymbiform. Pollinia 4, in 2 pairs, on the side of the column, hemispherical, orange-yellow. Capsules including pedicels 4 cm long, ribbed.

Rare, on tree trunks in deep forests. This species resembles Aerides odoratum in vegetative condition but the flowers are very distinct and can be easily separated from the latter.

Fls. & Frts. : September to October.

Specimens examined: Myrthong 2997 Jowai (Jaintia Hills).

Rhynchostylis Bl.

Rhynchostylis retusa Bl. Bijdr. 286. t. 49. 1825; Hook.f. Fl. Brit. India 6: 32. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 213. t. 284. 1898; Tuyama in Hara, Fl. East. Himal. 449. 1966.

Epiphytes. Stems woody, twisted, clothed with dry sheaths. Leaves linear, overlapping at base, apex shallowly notched or unequally 2-fid, blades 15-20 x 2-3 cm, coriaceous. Peduncles dense-flowered, simple or branched. Flowers pink, 1.5-2 cm across. Sepals and petals subequal, spreading. Lip adnate to a short foot of column, entire. Spur hairy at the mouth. Pollinia 2, elliptic or subglobose, 2-cleft. Capsules 1.5 cm long, ribbed.

Common on tree trunks, specially in lower elevation.

Fls. & Frts. : June to August.

Specimens examined: Myrthong 3100 Lailad, 3137 Nongpoh (Khasi Hills).

Saccolabium Bl.

Epiphytes. Leaves flat, keeled or terete. Flowers more or less small, in racemes, panicles or corymbs. Sepals and petals subequal, free, Lip sessile on the footless column, spurred, Pollinia 2, entire, cadicle short. Ovary slender.

K E Y T O S P E C I E S

1a. Leaves small, very short; spur hemispheric; lip with didymous callus at base . . . . . distichum

1b. Leaves large, long; spur horn-like; lip with hooked callus at the throat . . . . . trichromum

Saccolabium distichum Lindl. in Journ. Linn. Soc. 3: 36. 1859; Hook.f. Fl. Brit. India 6: 64, 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 227. t. 303. 1898.

Stems slender, weak, 1-2 mm across. Leaves distichous, fleshy, 2-3 x 0.5-0.8 cm, obtusely 2-lobed, lanceolate, sessile. Racemes subterminal, few-flowered. Flowers few, 1 cm across. Sepals and petals subsimilar, oblong. Lip entire, lobes obscure, Spur saccate, elliptic. Capsules 1 cm long, clavate.

Rare, on tree trunks in forests.

Fls. & Frts. : May to July.

Specimens examined: Myrthong 2978 Jowai (Jaintia Hills).

Saccolabium trichromum Reichb. f. in Hamb. Gartenz. 51. 1859; Hook.f. Fl. Brit. India 6: 65. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 229. t. 306. 1898.

Stems slender, 30-40 cm long, leafy all over. Leaves linear, 15-25 x 1-2 cm, obliquely acuminate, tuberculately granulate all over. Racemes lateral, from the middle of the [illegible] internodes, peduncles stout, dense-flowered. Flowers yellowish-pink, 1.2 cm across. Sepals and petals subequal, spreading, linear-oblong. Lip pinkish-white. Spur clavate, crested. Capsules 1-1.5 cm long, subfusiform.

Rare, on tree trunks in forests.

Fls. & Frts. : April to August.

Specimens examined: Myrthong 2972 Jowai (Jaintia Hills).

Sarcanthus Lindl.

Sarcanthus filiformis Lindl. in Bot. Reg. 1842: Misc. 61. 1842; Hook.f. Fl. Brit. India 6: 66. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 240. t. 319. 1898; Tuyama in Hara, Fl. East. Himal. 449. 1966.

Epiphytes. Stems terete, variable, pendulous. Leaves terete, 1-sided, 20-25 x 0.5 cm. Racemes lax-flowered, shorter than leaves. Bracts small, Flowers 8 mm across, yellowish. Sepals oblong, reflexed. Petals linear, reflexed. Lip oblong, fleshy, adnate to the foot of column. Spur saccate, funnel-shaped. Capsules 1 cm long, ribbed.

Occasional in forests.

Fls. & Frts. : June to September.

Specimens examined: Deka 10116 Nongpoh, Khasi Hills (ASSAM).

Schoenorchis Reinw.

Schoenorchis gemmata (Lindl.) J.J. Sm. in Nat. Tijdschr. Ned. Ind. 72: 100. 1912; Tuyama in Hara, Fl. East. Himal. 450. 1966.- - Saccolabium gemmatum Lindl. in Bot. Reg. Misc. 50. 1838.

Epiphytes. Roots tufted. Stems tufted, clothed with striate, wrinkled sheaths, 5-15 cm long, falcate. Leaves terete, 5-10 cm long, apex acuminate. Peduncles 5-10 cm long, axillary, branched, branches 3-5 cm long, dense-flowered. Bracts minute, deciduous. Flowers sessile, minute, 1 mm across, purple. Sepals and petals similar, white or purple. Lip cumbiform, obtuse, sidelobes minute, midlobe rounded. Column minute, hump-like. Capsules elliptic, 2-3 mm long, ribbed.

Rare, on tree trunks in forests.

Fls. & Frts. : October to January.

Specimens examined: Myrthong 3133 Sutnga (Jaintia Hills).

Spathoglottis Bl.

Spathoglottis pubescens Lindl. Gen. Sp. Orch. 120. 1830; Hook.f. Fl. Brit. India 5: 814. 1890.

Terrestrials. Pseudobulbs 1-2 cm across. Leaves 5-15 x 0.5-2 cm, plicate, linear or linear-lanceolate. Scapes 10-40 cm long, slender, jointed with membranous scales at the nodes. Bracts cuneate, 5-8 mm long. Flowers few, 1-6, golden yellow, 2 cm across. Sepals 1 cm long, obtuse, 5-9-nerved. Petals equalling sepals, but slightly broader, spreading. Lip brown violet within, pubescent. Spur 0. Pollinia 8. Capsules cuneate, oblong, ribbed.

Common in grasslands associated with grasses and sedges.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 3054 Shillong, 3278 Nongkrem (Khasi Hills).

Spiranthes Rich.

Spiranges lancea (Thunb. ex Sw.) Backer, Bakh. & Steen. in Blumea 6, 2: 361. 1959. - - Ophrys lancea Thunb. ex Sw. Kgl. Vet. nya Handl. 21: 223. 1800. - - Herminium lancea (Thunb. ex Sw.) Vuijk in Blumea 11, 1: 228. 1961; Seidenfad. in Dansk Bot. Ark. 31(3): 20. t. 7. 1977.

Terrestrials. Roots fleshy, 2-4 mm across. Stems 10-30 cm long. Leaves subradical, 2-10 x 0.5-1 cm, apex rounded, base narrowed to a sheathing petiole. Flowers pink, secund, on twisted axis. Bracts 4-5 mm long, straw coloured. Sepals filiform, green, 2-4 mm long. Petals as long as sepals but much broader, deep pink. Lip longer than petals with recurved apex, pink within, white without, entire. Capsules 5 mm long, fusiform.

Common both in open and shrubby areas associated with grasses and other herbaceous plants. Seidenfaden (1967) treats this taxon under Herminium lancea.

Fls. & Frts. : June to October.

Specimens examined: Myrthong 1020, 1524 Shillong, (Khasi Hills), 1654 Jowai (Jaintia Hills).

Staurospsis Reichb. f.

Staurospsis undulatus Benth. ex Hook.f. Fl. Brit. India 6: 27. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 205. t. 9 . 1898.

Epiphytes, sometimes terrestrials. Roots stout, subsecund, all over the part of the stem, some in between the leaves. Stems suberect, completely clothed with leafsheaths, glandular. Leaves oblong, 6-10 x 1-1.5 cm, apex 2-lobed. Peduncles lateral, leaf-opposed, 10-20 cm long, jointed, few-flowered. Bracts membranous, obtuse. Flowers whitish-blue, 2-3 cm across. Sepals undulate, deflexed. Petals similar to sepals, slightly narrower. Lip white or yellowish-white, with pinkish margin. Column concave. Capsules 8 cm long, clavate, or fusiform, ribbed.

Common on moss covered rocks or on cut edges of old landslides, associated with ferns and other hervaceous plants.

Fls. & Frts.: April to October.

Specimens examined: Myrthong 1175 Shillong peak.

Sunipia Lindl.

Sunipia scariosa Lindl. Gen. Sp. Orch. 179. 1833; Hook.f. Fl. Brit. India 5: 772. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 161. t. 219. 1898. - - Ione scariosa (Lindl.) King et Pantl. in Ann. roy. Gard. Calc. 8: 161. t. 219. 1898. - - Ione racemosa (J.E. Sm.) Seidenfad. in Saertryk Bot. Tidsskrift 64: 227. 1969.

Rhizomes prostrate, with fibrous old sheaths all over. Pseudobulbs conic, 2-3 cm long, sub-fusiform, longitudinally wrinkled. Leaves 20-25 x 2-4 cm, base narrowed to a sheathing petiole, apex rounded, slightly erose or retuse. Scapes as long as leaves, 2-3 nodded. Bracts membranous, acute. Spikes dense-flowered. Flowers embraced by persistent bracts. Sepals subequal, dorsal sepal ovate, lateral sepals cuneate, longer than dorsal one. Petal much shorter than sepals. Lip oblong, entire. Column erect, fleshy.

Occasional on tree trunks in forests.

Fls. & Frts.: March to August.

Specimens examined: Myrthong 1662 Jowai (Jaintia Hills).

Thelasis Bl.

Epiphytes. Pseudobulbs ovoid or conic, small. Leaves oblong, 1-2, narrow. Scapes developing from the base of the pseudobulbs. Flowers minute, inverted in spikes. Sepals subequal, connate, concave, winged. Petals membranous. Lip sessile, on the base of column, ovate, oblong. Pollinia 8, caudicles slender.

K E Y T O S P E C I E S

1a. Lateral sepals keeled; scapes slender; lip contracted towards the tip . . . . . pygmaea

1b. Lateral sepals not keeled; scapes stout; lip not as above. . . . . khasiana

Thelasis khasiana Hook.f. Icon. Pl. 1889; et Fl. Brit. India 6: 87. 1890.

Pseudobulbs globose, 1-leaved. Leaves 10-15 x 2 cm, oblong, acute. Scapes stout, as long as leaves. Bracts ovate-lanceolate, obtuse. Sepals subequal, ovate-lanceolate, obtuse. Petals lanceolate, obtuse, as long as sepals. Lip cuneate, apex rounded. Capsules 5 mm long, ovoid.

Occasional in forests.

Fls. & Frts.: September to October.

Specimens examined: Hynniewta 30896 Orchidarium, Botanical Survey of India, Shillong (ASSAM).

Thelasis pygmaea Lindl. in Journ. Linn. Soc. 3: 63. 1859; Hook.f. Fl. Brit. India 6: 86. 1890.

Pseudobulbs conic, 1-leaved. Leaves 5-6 x 1.5 cm, oblong. Scapes longer than leaves, lax-flowered. Bracts ovate, acute.

Flowers minute, 3 mm across. Sepals ovate-lanceolate, acute. Petals similar to sepals. Lip ovate, contracted towards the tip. Rostellum 2-fid. Capsules minute, 2-3 mm long, turgid.

Occasional on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Rao 53033 Nongpoh (Khasi Hills) (ASSAM).

Thunia Lindl.

Thunia alba (Lindl.) Reichb. f. in Bot Zeit. 764. 1852; Rao & Balak. in Rec. bot. Surv. India 20(2): 218. 1973; - - Phajus albus Lindl. Gen. Sp. Orch. 128. 1831; Hook.f. Fl. Brit. India 5: 818. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 110. t. 153. 1898.

Epiphytes. Stems 30-40 cm long, pendulous, leafy all over. Leaves 15-20 x 1.5-3 cm, distichous, linear-lanceolate, acute with distinct midrib, sheaths closely embracing the internodes. Flowers terminal, 1-4, white. Bracts 2-3 cm long, cuneate. Pedicels 1 cm long, Sepals 4-5 cm long, white. Petals similar to sepals. Lip clavate or suborbicular with broad midlobe. Spur short. Capsules 2-3 cm long, ribbed.

Common on tree trunks in forests.

Fls. & Frts.: August to October.

Specimens examined: Myrthong 1936 Tura peak (Garo Hills).

Trias Lindl.

Trias oblonga Lindl. Gen. Sp. Orch. 60. 1830; Hook.f. Fl. Brit. India 5: 780. 1890; Seidenfad. in Saertryk Bot. Tidsskrift 71: 25. t. 23. 1976.

Rhizomes prostrate, woody. Pseudobulbs ovoid, depressed, 1-leaved. Leaves ovate, acute, fleshy, 2-4 x 2 cm, sessile. Flowers solitary, pinkish-white, 6-8 mm across. Sepals cuneate. Petals similar to sepals. Lip contracted at the base, with infolded auriculate edges near the base. Column stout, scupper-shaped, with rounded lobules. Capsules 1 cm long, obtusely ribbed.

Rare, on tree trunks in forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 2991 Shillong.

Tropidia Lindl.

Tropidia angulosa Bl. Orch. Archid. Ind. 122. 1858; Hook.f. Fl. Brit. India 6: 92. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 275. t. 365. 1898.

Terrestrials. Stems 20-30 cm long, clothed with leathery, striate sheaths at each node. Leaves 15-20 x 6-10 cm, ovate, acute, base sheathing, plicate. Scapes short, 4-5 cm long, dense-flowered. Bracts 1-1.5 cm long. Flowers 2 cm across. Sepals connate, 3-5-nerved, oblong-lanceolate. Petals similar to sepals, narrower. Lip equalling petals, oblanceolate, obtuse, entire,

adnate to the column. Pollinia clavate, deeply grooved. Caudicle long, slender. Spur parallel to column. Capsules clavate, cylindric, obtusely ribbed.

Rare, collected only once from Tura forest.

Fls. & Frts. : July to December.

Specimens examined: Myrthong 3123 Tura forest.

Uncifera Lindl.

Epiphytes. Stems leafy, pendulous. Flowers small, in dense racemes. Sepals concave. Petals similar to sepals, spreading. Lip 3-lobed, spurred. Spur longer than sepals, curved, sidelobes adnate to column above the base, midlobe fleshy, concave. Column short, curved with small outgrowths below the amther on either side. Pollinia 4, unequal, caudicle long, inflexed.

K E Y T O S P E C I E S

1a. Leaves ovate-lanceolate, obliquely acuminate; lipvobtuse; spur slightly curved . . . acuminata

1b. Leaves linear-lanceolate, 2-fid; lip acute; spur strongly curved . . . . . obtusifolia

(Fig 6.)

Uncifera acuminata Lindl. in Journ. Linn. Soc. 3: 40. 1859; Saccolabium acuminatum Hook.f. Icon. Pl. 1889; et Fl. Brit. India 6: 65. 1890.

Roots numerous, all over the stem. Stems weak, pendulous, variable. Leaves narrow, ovate-lanceolate, obliquely acuminate,

2-6 x 1-2 cm, fleshy. Peduncles as long as or shorter than leaves. Flowers green, sepals 1.5 mm long, rounded, green, incurved. Petals similar to sepals. Lip rounded. Spur long, curved, 1 cm long. Capsules 8 mm long, ribbed.

Common on tree trunks in forests.

Fls. & Frts. : March to July.

Specimens examined: Myrthong 3297 Jowai (Jaintia Hills).

Uncifera obtusifolia Lindl. in Journ. Linn. Soc. 3: 40. 1859; Tuyama in Hara, Fl. East. Himal. 2 Rep. 195. 1971. - - Saccolabium obtusifolium Hook.f. Icon. Pl. 1889; et Fl. Brit. India 6: 65. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 222. t. 295, 1898.

Stems stout, clothed with brown sheaths, pendulous. Leaves 20-30 x 2-3 cm, oblong, unequally notched. Peduncles longer than leaves, dense-flowered. Flowers 1 cm across, yellowish-green. Sepals oblong-ovate, obtuse, dorsal sepal concave. Petals shorter than sepals but broader, obtuse. Lip longer than sepals, funnel-shaped, 3-lobed, sidelobes triangular, midlobe ovate, obtuse. Column beaked. Capsules fusiform, 1 cm long, obtusely ribbed.

Common on tree trunks in forests specially in lower elevation.

Fls. & Frts. : September to October.

Specimens examined: Doka (without number) Umsaw, Khasi Hills, (ASSAM).

Vanda R. Br.

Epiphytes. Leaves flat or terete. Flowers usually large, showy, in racemes, rarely solitary, Bracts shorter than ovary. Sepals spreading or connivent, Petals similar to sepals. Lip saccate or spurred, adnate to the short foot of the column, sidelobes large or small, rarely 0, midlobe fleshy. Column stout, short, foot short or 0. Anthers 2-celled. Rostellum obscure or 0. Pollinia 2, globose, caudicle short or long, geniculate, Capsules usually oblong, ribbed, straight.

K E Y T O S P E C I E S

1a. Leaves terete . . . . . tores

1b. Leaves flat.

2a. Stems short, clothed with spiral leafsheaths, leaf apices with small teeth or lobules, sidelobes of lip erect, triangular, apex of lip with 2 divaricate lobules . . . . cristata

2b. Stems elongate, naked below, leaf apices without lobules, sidelobes of lip small, not as above . . . . . caerulea

Vanda caerulea Griff. ex Lindl. Bot. Reg. t. 30. 1847; Hook.f. Fl. Brit. India 6: 51. 1890. (Plate 112).

Stems stout, variable, leafy all over. Leaves oblong, 10-12 x 2-2.5 cm, apex unequally nothced. Peduncles longer than leaves, lax-flowered. Flowers blue, 4-6 cm across, spreading, showy. Sepals and petals subequal, spreading, margin undulate, broader towards the apex. Lip shorter than sepals, spurred. Column fleshy, truncate, Pollinia 2, attached to the side of the viscidium. Capsules oblong, straight, ribbed.

Plate 112 Vanda caerulea Griff. ex Lindl. A. Habit B. Sepals, C. Petals, D. Labellum, E. Column with Pedicel, F. Pollinia.

One of the most beautiful orchids in the State which has been indiscriminately collected and is now rendered in danger.

Fls. & Frts. : September to November.

Specimens examined: Myrthong Shillong.

Vanda cristata Lindl. Gen. Sp. Orch. 216. 1833; Hook.f. Fl. Brit. India 6: 53. 1890; Tuyama in Hara, Fl. East. Himal. 2 Rep. 195. 1971. - - Luisia cristata (Lindl.) Kranzl. in Reichb. f. Xen. Orch. 3: 120. 1900; Seidenfad. in Dansk Bot. Ark. 27: 93. 1971.

Stems 5-6 cm long, curved, clothed with leaf-sheaths. Leaves linear, oblong, 15 x 1 cm, apex primose or erose with overlapping sheaths. Racemes as long as leaves, few-flowered. Bracts broad. Pedicels long, clavate. Flowers 2-3.5 cm across, yellowish-green. Sepals and petals subequal, 1.5 cm long, narrow. Lip 3-lobed, sidelobes acute, crenulate, midlobe as long as sepals. Capsules 3-4 cm long, ribbed.

on tree trunks in forests.

Fls. & Frts. : October to November.

Specimens examined: Myrthong 2970 Jowai (Jaintia Hills).

Vanda teres Lindl. Gen. Sp. Orch. 217. 1833; Hook.f. Fl. Brit. India 6: 49. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 214. t. 285. 1898.

Stems 0.5-1 m long, rooting all over. Leaves terete, 8-10 x 0.3-0.5 cm, rounded at the apex. Peduncles up to 10 cm long, leaf-opposed, few-flowered. Flowers yellowish, 4-8 cm across. Sepals broad, undulate, clawed, 7-9-nerved, with many nervules.

Petals similar to sepals but larger, rounded, slightly clawed. Lip hairy, with crimson yellow spots within. Capsules erect, linear, up to 8 cm long, ribbed.

Common on tree trunks in forests, both in pine and in broad leaved forests.

Fls. & Frts. : August to October.

Specimens examined: Myrthong 1978 Shillong (Khasi Hills); Jamir 4676 Karampani (Jaintia Hills), (NEHU).

Zeuxine Lindl.

Terrestrials. Stems glabrous or pubescent, succulent. Leaves membranous. Flowers in spikes or racemes. Sepals subsimilar, dorsal sepals concave, forming a hood with petals. Petals connate at base. Lip adnate to the base of column, cymbiform, saccate at base, glandular within, apex entire or 2-lobed. Rostellum large, deeply cleft. Column short, winged. Pollinia pyriform, attached by an oblong gland to the rostellum.

K E Y T O S P E C I E S

1a. Leaves ovate,acute; lip shorter than sepals; pollinia subglobose . . . . . flava

1b. Leaves ovate-lanceolate; lip longer than sepals; pollinia sub-elliptic . . gracilis

Zeuxine flava (Lindl.) Benth. ex Hook.f. Fl. Brit. India 6: 108. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 289. t. 286. 1898; Tuyama in Hara, Fl. East. 452. 1966, et 2 Rep. 195. 1971. - - Monochilus flavum Wall. ex Lindl. Gen. Sp. Orch. 487. 1840.

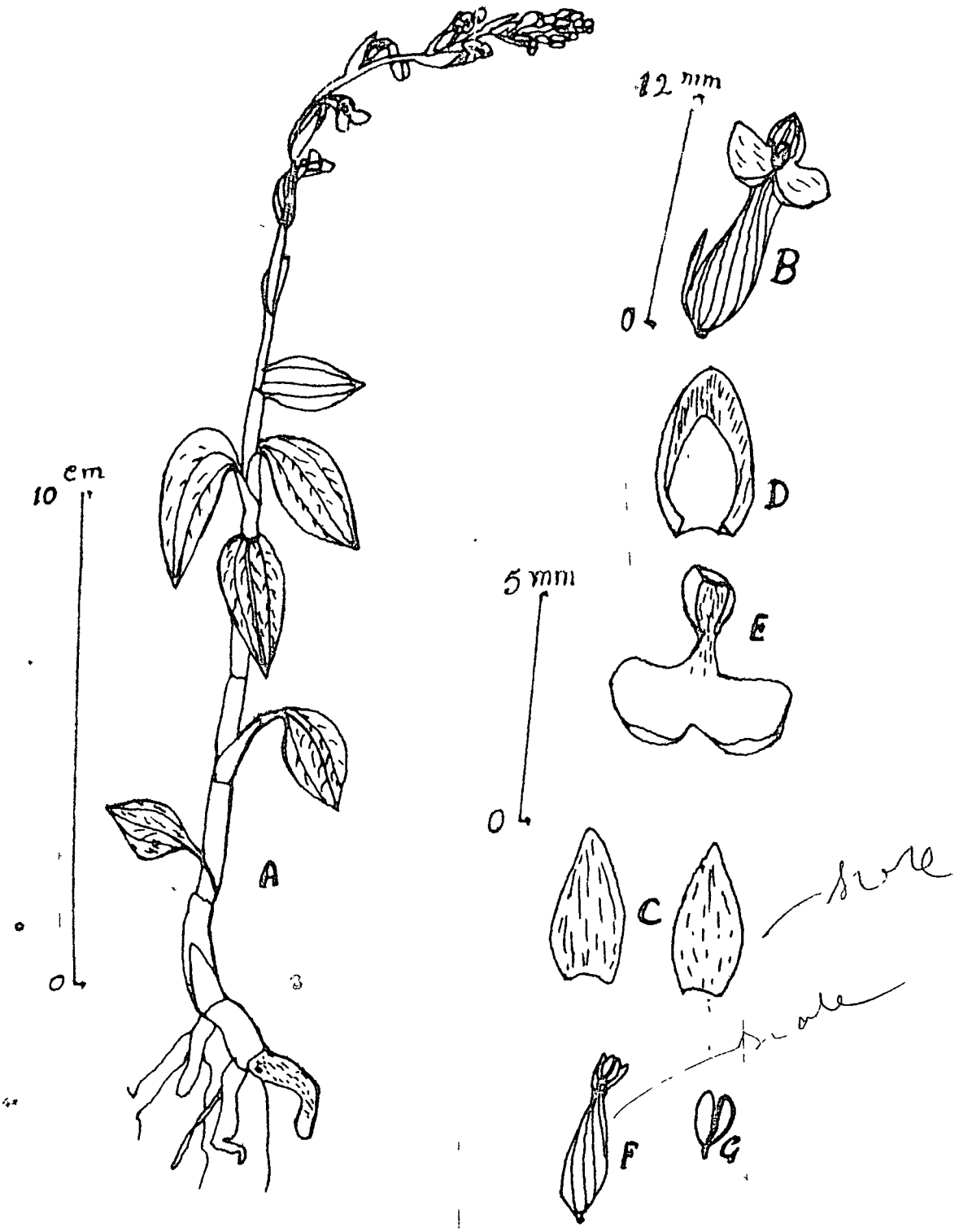


Plate 114. Zeuxine gracilis (Breda) Bl. A. Habit, B. Flower, C. Sepals, D. Petal, E. Labellum, F. Column and Ovary, G. Pollinia.

Roots hairy. Stems fleshy, 15-30 cm long. Leaves ovate, acute, 3-4 x 1-1.5 cm, hairy. Scapes 10-15 cm long, hairy. Racemes 6 cm long. Flowers 8 mm across, whitish-pink. Sepals greenish. Petals white. Lip yellowish- . Spur white, clavate, or subclavate, slightly 2-fid. Capsules oblong-lanceolate, erect, 1.5-2 cm long, slightly twisted, ribbed.

Common in forest clearings, specially on hills.

Fls. & Frts.: April to June.

Specimens examined: Myrthong 1131 Shillong.

Zeuxine gracilis (Breda) Bl. Fl. Java n.s. 56. t. 18. 1858. Psychechilus gracile Breda Gen. Sp. Orch. t. 9. 1827. - - Zeuxine affinis Benth. ex Hook.f. Fl. Brit. India 6: 108. 1890; King et Pantl. in Ann. roy. bot. Gard. Calc. 8: 290. t. 387. 1898 (Plate 114).

Stems 6-12 cm high. Leaves ovate-lanceolate, 2-4 x 1.5-2 cm, usually yellowish or pale straw coloured, acute at the apex, subacute or cordate at base, sheathing. Spikes 5-8 cm long, dense-flowered. Bracts 0.5-1 cm long, shorter towards the apex, pubescent. Flowers 5-6 mm across, white. Sepals 3 mm long, cuneate. Petals as long as sepals, white. Lip broad, channel-like, 3-lobed, side-lobes shorter than midlobe, obtuse, midlobe reflexed, truncate or crenate. Capsules 1 cm long, turbinate, pubescent.

Frequent in grasslands and forest clearings associated with ferns and other herbaceous plants.

Fls. & Frts. : September to March.

Specimens examined: Myrthong 1840 Shillong peak.

Plate 115.

A. A tree in evergreen forest bearing a dense growth of epiphytic vegetation.

B. Screw pine forest (Pandanus odoratissimus (Lamk.) Linn.f. near Mawsynram, Khasi hills.

Plate 116.

A. Wild Banana plants in a forest cleared hillock in Khasi hills.

B. Bamboo forest in a 20-25 year old jhum fallow near Byrnihat.

Plate 117.

A. A pine forest near Mawlai. .

B. Deciduous forest of Teak (Tectona grandis Linn.f.) near Umling, Khasi hills.

Plate 117

Plate 118.

A. A Sacred forest (Lawkyntang) near Mawsmai, Khasi hills. Note the dense protected vegetation amidst forest cleared grasslands.

B. View of another sacred forest (Lawlyngdoh) near Mawphlang, Khasi hills.

Plate 119.

A. Practise of jhum cultivation involving the clearfelling of forest growth.

B. Another jhum area showing Maize cultivation. Note the dense natural forest at the back.

Plate 119

Plate 120.

A. A view of Tassek lake in Garo hills, showing dense aquatic vegetation along the margins.

B. Ottelia alismoides Pers.in a pond in Garo hills.

Plate 120

Plate 121. Wallichia caryotoides Roxb. in a secondary forest near Trongpleng, Khasi hills.

Plate 122. Spadices of Amorphophallus bulbifer (Roxb.) Bl.

Plate 123. Arisaema freternum Schott in the forest.

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