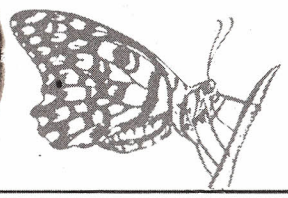
Butterflies Of Shillong And Its Environs



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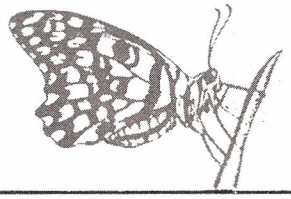
Text by
C. Radhakrishnan, J.R.B. Alfred and M.R. Rynth

Photographs by
Yogeshwar Kumar



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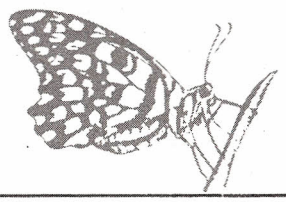

Meghalaya, alongwith the rest of the North Eastern region abounds in many exquisite varieties of butterflies. The richness and variety of the butterfly population of the State has of late suffered on account of the destruction of the habitat which sustains the whole life cycle of butterflies. While Meghalaya has been losing its pre eminence in its butterfly fauna, a few people have begun to take interest in rearing them and making their presence known to the public at large.

This book is an attempt to present details of the varieties of butterflies that are found in and around Shillong.

The book is also a guide to help in generating greater awareness of the fauna of butterflies and further to help in identifying them with very useful and carefully selected photographs.

We wish to place on record our appreciation of the exce llent work done by Dr.C. Radhakrishnan, Scientist SD,Dr. J.R.B. Alfred Joint Director, Zoological Survey of India,and Shri Yogeshwar Kumar, Officer On Special Duty in the Planning Deptt. Govt. of Meghalaya in making the publi cation of this work possible.

Science and Technology Cell
Planning Deptt.
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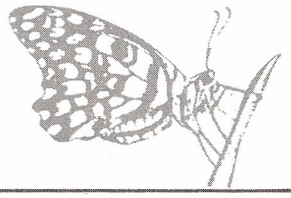


ACKNOWLEDGEMENTS

The task of bringing out this book proved more stimulating and challenging than we had ever anticipated at the outset. We owe our gratitude for help at all stages of preparation to friends and colleagues. To Prof. Mohammad Shamim Jairajpuri, Director, Zoological Survey of India, we are grateful for his ready willingness to write the foreword. We are indebted to Shri Yogeshwar Kumar, Officer on Special Duty, Planning Department, Government of Meghalaya, for initiating the work, encouragement and help at all stages and most of all for taking time off to photograph all the butterflies. Shri D. Wankhar, Riatsamthiah, Shillong, has helped in providing some butterflies and other assistance for which act of kindness we owe him our special thanks. He was a constant source of encouragement.

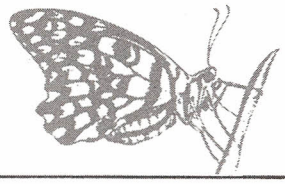
All our colleagues of the Eastern Regional Station, Zoological Survey of India, Shillong have helped us in various ways for which we are grateful and in particular to Miss Siwanta Mawlong who typed the manuscript and Shri B.K. Dhar for assistance in Photography. To Dr. R.K. Varshney our thanks for providing the updated names of the butterflies species.

The Science and Technology Cell of the Planning Department, Government of Meghalaya, with Shri R.V. Pillai, Special Secretary was the main encouragement for the book in its present form. He not only assisted in various ways but also financially supported the printing and publishing of the book. The Adland Publicity Pvt. Ltd., Calcutta, who are responsible for the book in the final form have not only done it as part of their general job, but have helped in the production professionally.

We owe our greatest debt of thanks to our respective families who, for the sake of the book, allowed us the time which was rightfully theirs. If nature's beauty and the thought of conservation reaches those who use this book we would have achieved our aim.

Authors

PREFACE



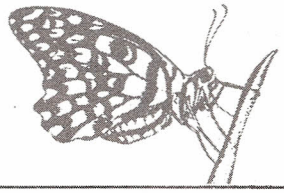
Butterflies are among the most easily recognizable of all animals. Their wings, unlike those of most other insects, are colourful and opaque and they are of a characteristic shape. Their popularity is due largely to their appearance. Many butterflies are among the most gorgeous of creatures, noted for their glorious colours. The development of colour, its range, diversity and brilliance is unrivalled anywhere in the Animal Kingdom, except possibly by birds.

Butterflies are always active during day. This is one important factor which draws our attention to them, because it not only ensures that their colours are fully appreciated, but it contrasts sharply with the behaviour of many other animals which are mostly nocturnal.

It is therefore hardly surprising that butterflies have been so popular among collectors. A collection of butterflies is more than just a selection of creatures for scientific study, it is a thing of beauty in itself.

The life cycle of the butterfly is no less remarkable than the beauty of the adult. One of the regularly performed miracles of Nature is the transformation of the usually ugly caterpillar into a beautiful butterfly. This turning of a beast into a beauty includes an important ecological feature — the larva and adult are able to lead totally different life styles — thus enabling these two stages of the life cycle to avoid competing with each other for the same food.

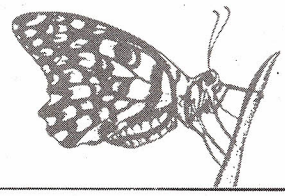
Unfortunately, butterflies are threatened by habitat destruction almost everywhere. Some of the richest areas for wildlife are being cleared at such rates that even if the butterflies could survive in their new habitats, their larvae probably would not, due to loss of their specific food plants. It is no use protecting butterflies because they are attractive, unless we take greater care to conserve their unattractive larvae and their habitat.



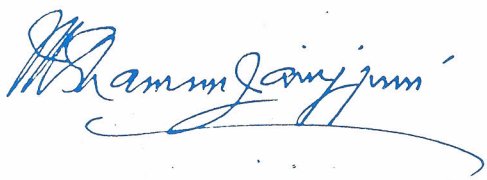
The present book is an attempt to collate and put together information on butterflies in and around Shillong in the State of Meghalaya. This single volume cannot hope to cover more than a fraction of Meghalaya's butterflies, but it is hoped that this will be a beginning primarily for identification of the most common ones available. Though considerable care has been taken with the systematic list, scientific names of butterflies keep being updated. We have incorporated the latest names along with common names which will be useful to both those with a scientific bent of mind as well as the curious naturalist. Colour photographs are provided for all species represented and the colour index helps in more accurate identification of each species.

AUTHORS

FOREWORD



Butterflies, like some birds and few fishes are extremely beautiful animals, unlike most moths which are their closest relatives. Nature has also been very kind to them. Though cosmopolitan in distribution, butterflies are found more abundantly in tropical countries like our own compared to the temperate zones of the world. Besides their aesthetic value these insects play an important role in agriculture, forestry etc. The collection, identification and preservation of these highly attractive insects is a rewarding experience for any naturalist. This book written by Radhakrishnan, Alfred and Rynth on the butterflies occurring in and around Shillong is easy to understand and the non-technical language is very welcome. The authors have the required knowledge and expertise to write this particular book. Moreover, the book provides basic information on their structure, identification and distribution along with the method of collection and preservation. I am confident that zoologists as well as non-zoologists will equally benefit from the book and I wouldn't be surprised to see many young nature enthusiasts chasing butterflies in Shillong and other parts of the country holding this book in one hand and an insect net in the other.



(Prof. Mohammad Shamim Jairajpuri)
Ph.D., D.Sc., FZSI, FI Biology (London)
DIRECTOR
Zoological Survey of India

Dated, Calcutta
4 May 1989

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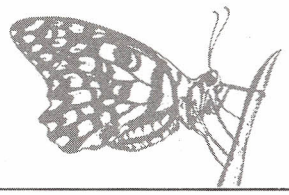
INTRODUCTION

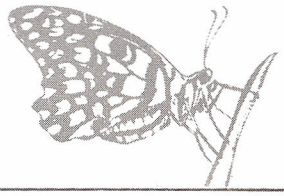


Butterflies belong to Lepidoptera which is a very distinctive order of insects second only to Coleoptera (beetles) in numbers of species. The 140,000 species in Lepidoptera comprise 20,000 butterflies plus six times as many moths in several equally distinct and quite separate groups. Conventionally, butterflies have clubbed antennae, fly by day and are often brightly coloured, whereas moths are nocturnal, usually dull coloured, and have tapered or feathered antennae. However, there are many colourful day flying moths, some of which even have clubbed antennae.

The details of classification are controversial and perhaps better be left to the specialist. In this book the traditional family divisions are retained, though there are strong arguments in favour of alternative groupings. As a guide in apparent confusion, readers may note that in the Animal Kingdom all family names end in — idae to distinguish them from super-family names ending in — oidea and sub-families which end in — inae.

Adult butterflies are built in the same general plan as their other insect relatives. The body consists of three main regions the head, the thorax and the abdomen, each with a specialized structure for different functions in the life of a butterfly. Each part is covered with a layer of minute scales which are responsible for the soft downy appearance of the body as well as the coloration so characteristic of butterflies.

The head is a small spherical capsule which bears the feeding apparatus and sensory structures. Butterflies always take their food in typical form using a specially modified "tongue" or proboscis. This is a long hollow tube which is coiled like a watch spring and tucked under the head when not in use. When needed it can be quickly unrolled and extended, by an increase in blood pressure.

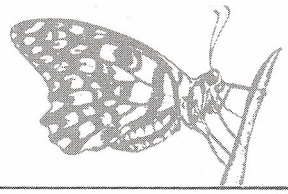


This feeding tube is composed of two parts which are grooved on their inner surface and joined along their length by tiny interlocking spines. The liquid food from the flowers is sucked up the central channel between the two parts assisted by a special type of pump in the head.

A pair of sensory palps or feelers (labial palps) are present one on each side of the proboscis. These are densely covered by scales and sensory hairs and serve to test the suitability of the food source. The antennae are typically club-ended. Each antenna consists of a series of rings or segments used in differentiating families. These antennae are sense organs, responsible for balance and smell. The base of the antennae houses a specialized organ, Johnston's organ which is of value to the insect in sensing direction particularly during flight. The smell receptors are scattered over the entire surface of the antennae.

The eyes are conspicuous hemispherical swellings on the tip of the head of the butterfly, called compound eyes. They are so called due to the large number of optical units or ommatidia which make up the eye structure. Each ommatidium resembles a single eye, capable of forming its own visual image, and they are sheathed by a pigment layer separating it from its neighbours. Therefore, a butterfly sees its surroundings as a complex mosaic of tiny pictures, each picture being created by a single ommatidium. However, the acuity of their vision is much inferior to that of man.

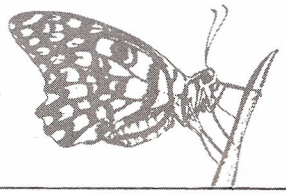
The middle zone of the body is the thorax which is the locomotory region, where both legs and wings are attached. The head is joined to the thorax by a flexible neck or cervix. The thorax is composed of three segments and each carries a pair of legs adapted both for walking and clinging. Each leg consists of several regions, the basal joint (coxa), the thigh



(femur), the shank (tibia) and the foot (tarsus). The coxa and femur are joined by a small triangular segment, the trochanter. The two pairs of wings are attached to the second and third thoracic segments. The delicate wings consist of an upper and lower membrane with a frame-work of hollow tubes between the layers. These are called the veins and are arranged in a very precise way. The pattern formed by these veins called venation is often a characteristic feature of a group of butterflies and helps in classification. At the base of the wings are small structures called sclerites helping in the flexible articulation between wings and the thorax, permitting the beating of wings in flight and also allowing them to be folded at rest, in upright position characteristic of butterflies.

The color patterns on the wings are due to the covering of scales. These scales overlap each other in a regular fashion resembling tiles on a roof. Each scale is raquet shaped, and the small projection or stalk at its base fits into a minute socket on the wing membrane. Scattered among the scales are specialised scent scales called androcoma peculiar to the males. At the base of these scales is a small gland which produces an aphroadisiac to excite the female during courtship.

The abdomen is much softer than the head and thorax and consists of ten segments of which only seven or eight can be easily seen. The end segments, known as genitalia, are modified for reproductive purposes. In the male there is a pair of claspers which grip the female during mating. In the female some fusion of the terminal segments occurs to give rise to an egg laying tube or ovipositor. The female also produces a scent attractive to the males of the species. The gland which secretes this are at the tip of the abdomen.

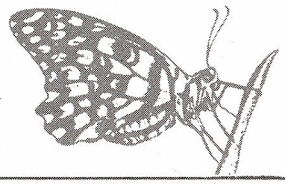


Butterflies belong to that group of insects which characteristically undergo a complete change or metamorphosis during the course of their development. Their life cycle includes both a larval and pupal stage before the adult butterfly emerges. The larva is completely different from the adult both in appearance and habits. The pupa is an inactive non feeding stage which gives rise to the adult. The pupa is called "chrysalis" while the emerging adult is known as "imago"

Eggs are laid on or very near to the food plant on which the larvae will feed. Most species lay their eggs singly and cement them to the plant by a sticky secretion. Usually they are laid on the under surface of leaves, the adult female butterfly alights on the upper surface and curves her abdomen under the leaf and lays her eggs in a suitable place there.

These eggs are commonly yellow or green in colour and usually darken before hatching. The shape of the eggs varies in different species and may be spherical or oval or flattened. The shell is often elaborately sculptured with regular ribs or pits (reticulation). At the top of the egg is a slight depression within which is a minute opening or micropyle. This is the place where the male sperm enters and once the egg is laid, air and moisture pass to the developing embryo through this pore. Just before hatching the fully formed embryo can be seen curled up within the transparent egg shell or chorion. The new larva gnaws its way through the shell and after hatching continues to eat the shell until only the base is left. After this the larva devours the food plant on which the egg was laid.

Larvae of butterflies are commonly called caterpillars. This is the main feeding stage in the life cycle. They feed mainly on the leaves of flowering plants and trees. As they grow they entirely fill their skin, which becomes very tight. In



order that a further size increase may occur this skin is shed from time to time. This shedding of the skin is called moulting or ecdysis and usually takes place four or five times before the larva is full grown. Each growth stage between moults is known as an instar.

The end of the larval life is marked by another moult giving rise to the pupa. The pupa is immobile and neither eats or drinks since the mouth and anus are sealed over, and the only functional openings are the spiracles which permit the exchange of respiratory gases. During this pupal stage much of the larval tissue is remoulded to give rise to adult structures, particularly the wings, mouth parts and reproductive organs.

The emergence of the adult takes place by the splitting of the pupal skin behind the head. The butterfly first frees its legs and antennae and then draws out the rest of its body. Immediately after emergence the wings are soft and crumpled. The butterfly slowly moves to a place from where its wings can hang downwards for the blood to be forced into them. Once they have reached the full size, the wings are held apart until they are completely dry and hardened, when they fly to feed on nectar of flowers.

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