



A new species of *Piper* (Piperaceae) from Arunachal Pradesh, north-eastern India

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A new species *Piper arunachalensis* Gajurel, Rethy et Kumar (Piperaceae) from Arunachal Pradesh, north-eastern India is described and illustrated. It is considered to be endemic to Arunachal Pradesh. The morphological differences between the species and related taxa are discussed and a key for identification constructed.

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ADDITIONAL KEY WORDS: dioecy – Durpang Reserve forest – endemism – section *Chavica* – semi-evergreen forest.

INTRODUCTION

The genus *Piper* L. is represented in India by 108 species from two independent centres of diversity, namely the sub-Himalayan and north-eastern hill ranges and the southern Decan (Rahiman & Nair, 1987). Since Hooker (1886), the species of the genus have not been subjected to any critical taxonomic study, particularly in north-eastern India. Our knowledge on the genus is far from complete.

Arunachal Pradesh, which is a biodiversity hot spot, has been known to contain over 25 species (out of about 65) of *Piper* in north-eastern India (Gajurel *et al.*, 1999). A perusal of literature reveals a lack of taxonomic studies in the genus from Arunachal Pradesh where many areas are still unexplored. To remedy this, a project has been undertaken by the Forestry Department of NERIST since 1997. During the course of our studies, we collected a specimen from Durpang Reserve forest in the Banderdewa range, which appeared distinct from all other species collected and described so far. The species is dioecious, as are other species of the region. Both male and female individuals

of the species were collected from the same area and were maintained in NERIST's germplasm collection. The species closely resembles *Piper mullesua* Ham. ex D. Don and could be misidentified as such. However, from a critical analysis of the species and comparative studies of the related taxa it has been established that this particular specimen shows some unique features and can be differentiated easily from *P. mullesua* and other related species. The pubescent nature of the stem, petiole and peduncle, the number of stamens and anther cells, and the length of the male spike distinguishes this species. Critical analysis of literature and herbarium specimens confirms that this species is as yet undescribed. Here it is described as a new species, *Piper arunachalensis*, so named after the state from which the type collection was made.

The species can be placed in the section *Chavica* Hook. f. which is distinguished by a solitary dioecious spike, an orbicular peltate bract with densely aggregated fruit in short cylindrical and globose or sub-globose spikes. Other taxa of the section which show some close relationship with *P. arunachalensis* Gajurel et Rethy are *P. mullesua* Ham. ex D. Don, *P. peepuloides* Roxb. and *P. sylvaticum* Roxb. However, these three species can easily be distinguished from the new spe-

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KEY TO SECTION *CHAVICA* HOOK. F.

Flower dioecious, flowering spike erect, bract orbicular peltate, fruit small, sessile in short or long cylindrical, globose or sub-globose spikes.

1. Fruiting spike globose or sub-globose, stigma sessile,
 2. Fruiting spike globose, 10–14 × 9–12 mm with 3–5 mm glabrous peduncle; drupe deep green; male spike 4–8 cm, stamens 2 with 2 anther cells; plant glabrous, erect shrub rarely climber *P. mullesua*
 2. Fruiting spike sub-globose, 10–14 × 5–7 mm with 1–2 mm pubescent peduncle, drupe light green; male spike 2–4 cm, stamens 3 with 4 anther cells; plant climbing shrub with finely pubescent stem, petiole and peduncle *P. arunachalensis*
1. Fruiting spike cylindrical much longer than broad, stigma sessile
 3. Fruiting spike 15–20 × 4–6 mm with 4–6 mm glabrous peduncle; drupe light green; male spike 4–8 cm; stamens 2 with 2 anther cells; plant climber, glabrous *P. peepuloides*
 3. Fruiting spike 20–30 mm with 5–10 mm glabrous peduncle; drupe deep green; male spike 4–7 cm, stamens 4 with 2 anther cells; plant normally low creeper, finely pubescent under surface of the leaves *P. sylvaticum*

cies by some important morphological characters. To facilitate field identification and distinguish these taxa an identification key is provided.

Piper arunachalensis Gajurel, Rethy et Kumar

sp. nov.

(Fig. 1)

P. mullesuae Ham. ex D. Don affinis sed differt habitu scandenti; caulibus pubescentibus; infructescentis subglobos, 5–7 mm latis spicis masculis 2–4 cm, staminibus 3.

Type. North-eastern India, Arunachal Pradesh, Durgang Reserve forest 300 m alt., 27°6'N latitude and 93°49'E longitude, nearly 1 km behind D.F.O. office, 31.i.98, Padma Raj Gajurel, 79 female, 80 male (Holotype CAL, Isotype ASSAM, APFH – Arunachal Pradesh Forest Herbarium, yet to be listed in Index Herbariorum).

Small dioecious climbing shrub. Branching system: dimorphic, orthotropic, climbing or creeping vegetative shoots and plagiotropic lateral aerial reproductive shoot. Stem terete with finely pubescent hair, hair prominent on the young vegetative shoots. Young emerging vegetative shoots purple. Nodes: simple and rooting in vegetative shoots, swollen, rootless in fertile shoots. Leaves of vegetative shoots ovate to elliptic, 5–9 ± 3.5–7 cm, acuminate, base slightly cordate, membranous, dark green; prominent lateral ribs; 3 pairs all arise from the base; petiole <6 cm, grooved, finely pubescent; stipule (leaf sheath) adnate to the petiole, early caducous. Leaves of fertile shoots lanceolate, 8–12 × 3–5 cm, shortly acuminate, base cuneate, rarely oblique; prominent lateral ribs in 3 pairs, 2 pairs arise oppositely from near the base, the distal pair arises

alternately 1–2 cm above the base; petiole short, 1–1.5 cm, finely pubescent.

Flowering spike leaf opposed, erect with densely aggregated achlamydeous, small, bracteate, unisexual flowers. Male spike 2–4 cm, filiform, light green when young, whitish during anthesis; peduncle 4–5 mm, finely pubescent, rachis hairy. Stamens 3, short, 1 mm, anther cells 4, just emerging beyond the bract during anthesis, filament thick. Female spike short, sub-globose 0.5 cm, greenish; peduncle 2–3 mm, finely pubescent, rachis hairy. Carpel one, ovary oblong 0.75 mm, stigmas 3 or 4 white, sessile. Bract in both male and female spikes orbicular peltate, 1 mm across, with short hairy stalk. Fruiting spike sub-globose 10–14 × 5–7 mm, peduncle 1–2 mm finely pubescent, drupes small, densely aggregated, globose, light green when young. Ripe fruit not seen.

Distribution. Very rare and endemic to Arunachal Pradesh. Recorded so far only from one place in type locality. Single individuals of male and female plants were seen.

Habitat and ecology. Grows on small hilltop in semi-evergreen disturbed primary forest, in thinly shaded areas with sandy loam soil. The species climbs up to 6 metres on forest trees. Flowering – December to February. Fruiting – April to August.

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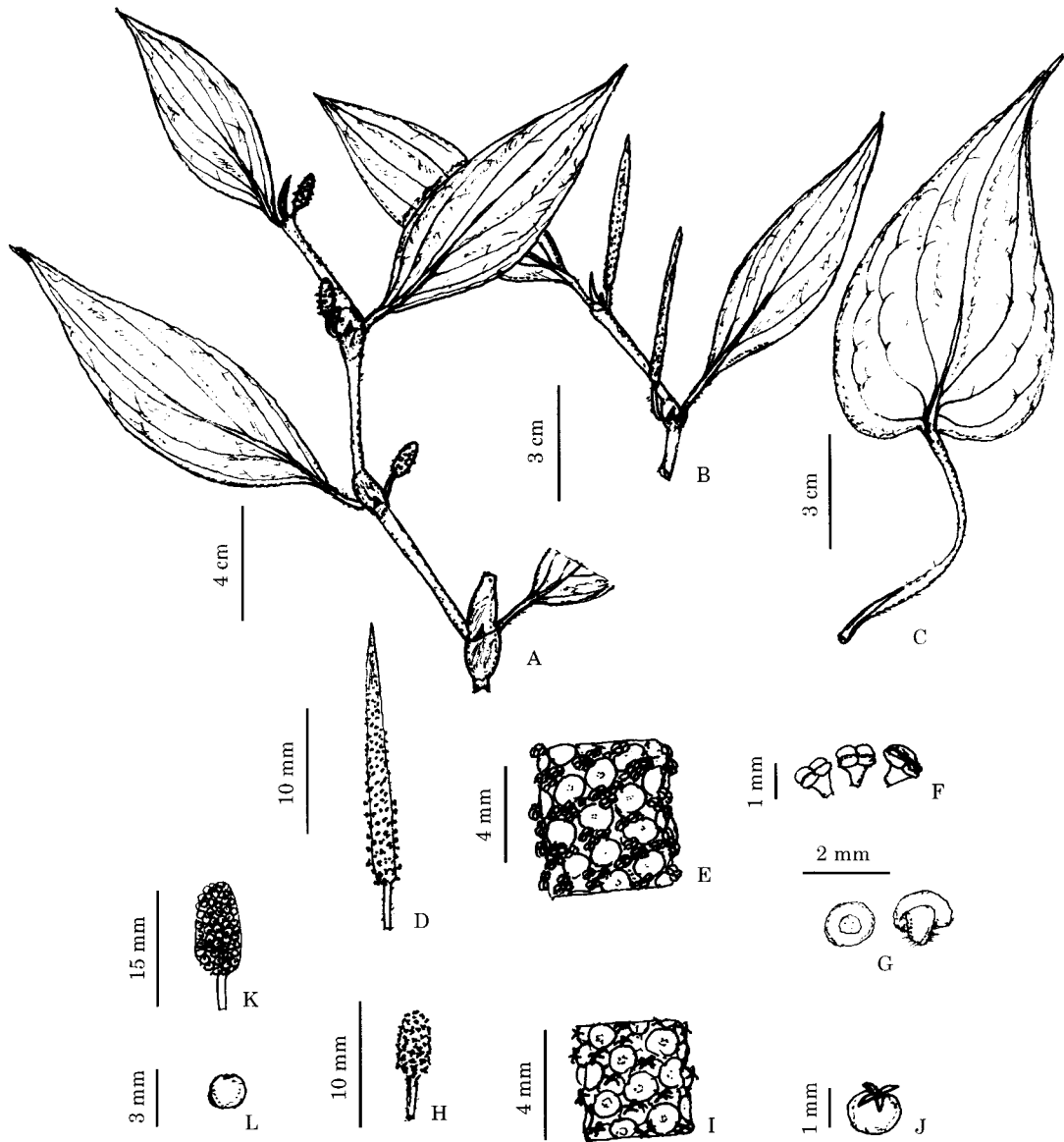


Figure 1. *Piper arunachalensis* sp. nov. A, female flowering shoot. B, male flowering shoot. C, leaf of vegetative shoot. D, male spike. E, same in part enlarged. F, stamen. G, bract. H, female spike. I, same in part enlarged. J, carpel. K, fruiting spike. L, fruit.

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