

Extended distribution of two species of *Bulbophyllum* Thouars (Orchidaceae) – addition to the flora of Assam, India

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Abstract

Bulbophyllum Thouars (Orchidaceae) is the second largest orchid genus in Assam. In this study, we recognized two *Bulbophyllum* species, *B. ambrosia* (Hance) Schlechter and *B. gracilipes* King & Pantling, as addition to the orchid flora of Assam. Detailed description, photographs, and distributional details are provided.

Key words: New addition, *Bulbophyllum ambrosia*, *Bulbophyllum gracilipes*, Chirang Reserve Forest, Assam.

INTRODUCTION

Northeastern India is blessed with wide range of physiography and ecoclimatic conditions and is the richest biodiversity centers of the Indian subcontinent (Clarke 1898; Hooker 1906; Chatterjee 1962; Rao 1968,1974; Joseph 1982) and it is considered as a paradise for botanists. However, the rich diversity is now depleting due to various anthropogenic causes, as a result many plant species are facing threat in their natural habitats (Haridasan & Rao 1985). The Orchidaceae is one of the large angiospermic families with over 1300 species belonging to 158 genera are present in India (Arora & Mukharjee 1983). Majority of Indian orchids are found in Northeast region with about 700 species (Sharma 1993).

The genus *Bulbophyllum* Thouars is perhaps the largest genus of Orchidaceae, with the estimated number of about 1,000 species in the world (Seidenfaden 1973, 1979; Emily 1988; Garay *et al* 1994). The majority of *Bulbophyllum* species are found in Asia, many in tropical America and Africa. The genus extends Northwards to Japan and Southwards to Australia and New Zealand. However, largest number of species occur in Indo-Malayan region (Seidenfaden 1973, 1979; Vermeulen 1987; Emily 1988). Out of 1000

species (Seidenfaden 1973, 1979). 82 species are reported from India, of which, 62 species (71 %) are known from Northeastern region, 14 species from South India and the remaining from other parts of India (Johns & Kumar 1997; Augustine *et al* 2001). In Assam the genus is represented by about 24 species (Chowdhery 2005). All the species in Assam are epiphytic, with some of them growing mainly on forest canopies and thus difficult to observe. In addition, vegetative parts generally lack diagnostic characters and some species can be identified only through floral morphology. In our recent floristic study in Chirang Reserve Forest of Assam, several species of *Bulbophyllum* were recorded in the semi-evergreen and deciduous areas of the forests. Some of those differ from previously described species of *Bulbophyllum* from Assam. After careful examination, literature consultation and comparisons with herbarium specimens, we are convinced that there are two taxa, those were not previously recorded from Assam. These two newly recorded species are now described and illustrated here.

STUDY AREA

The Chirang Reserve Forest covers about 593 sq km area and falls under the Haltugaon Forest Division of Assam. This reserve forest is spreading over the northern parts of present Kokrajhar district under the Bodoland Territorial Council. Geographically, the study area falls between 26° 0.06' 56.05½ N to 26° 0.54' 21.95½ N latitude and 90° 0.12' 03.76½ E to 90° 0.29' 07.02½ E longitude with various altitudinal gradients. This area is bounded on the west by the Saralbhanga River, on the north by the international boundary with Bhutan, on the east by the river Bhur and on the south it is bounded at present by National Highway 31. The Chirang Reserve Forest is situated in the buffer area of Manas Biosphere Reserve and Ripu-Chirang Elephant Reserve. The major rivers and streams in this Reserve Forest are Saralbhanga, Champamati, Gaurang, Bhur, Dholpani and Laopani. The River Saralbhanga and Bhur are emerged from the Bhutan hills. The soil is distinctly alluvial and has both the bhabar and terai tract. Three distinct seasons can be recognized, winter, summer and monsoon. Winter sets in middle of October and lasts till end of February. This is followed by warmer months of March, April and that continue till the middle of May. Monsoon sets in after that and continues till the end of September. The vegetation is mostly moist deciduous and patched with semi-evergreen to evergreen forests. Dominant tree species includes *Shorea robusta* Gaertner, *Dillenia pentagyna* Roxburgh, *Phoebe goalparensis* Hutchinson, *Tetrameles nudiflora* R. Brown, *Duabanga grandiflora* (Roxburgh *ex* DC.) Walpers and *Lagerstroemia speciosa* (Linnaeus) Persoon. Most of the woody species harbours different species of epiphytic orchids and the forest floors provide suitable environment for the growth of terrestrial and saprophytic orchids.

METHODOLOGY

Field surveys were conducted throughout the study area during 2009 – 2011 in different seasons. Efforts were made to study plants in their flowering condition so as to identify them properly. Standard methods for collection and preservation were used following Jain & Rao (1977). Voucher specimens are deposited at ASSAM Herbarium. Flowers were preserved in FAA to study the morphological details in future. Herbariums [ASSAM and digital herbarium of Royal Botanic Garden, Kew] and literature available on local floristic works, orchid manuals and regional publications (Chowdhery 1998; Deva & Naithani 1986; Hegde 1984; Hooker 1890; Misra 2007; Pradhan 2004; Pradhan 1979) were consulted for the identification our collected specimens.

RESULTS

The present investigation which is the outcome of intensive surveys during 2009 – 2011, has revealed the occurrence of 13 different species of *Bulbophyllum* in Chirang Reserve Forest. Among these, *Bulbophyllum ambrosia* (Hance) Schlechter and *B. gracilipes* King & Pantling found as new records for the state of Assam. Both the species are presented below along with their brief description and photographs.

Bulbophyllum ambrosia (Hance) Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 247. 1919; Averyanov in Bot. J. (Leningrad) 74(9): 1345. 1989; & in Tzvelev (Leningrad): 32. 1990; Phukan S., J. Orchid Soc. India, 19(1-2): 27 – 28, fig. 1, 2005; *Eria ambrosia* Hance, J. Bot. 21: 232. 1883; *Bulbophyllum odoratissimum auct. non.* (J.E. Smith) Lindley; *Bulbophyllum amygdalinum* Averyanov, Bot. J. 73(7): 1023, fig. 2, 1988. [PLATE - I: A - G]

An epiphyte; roots below pseudobulbs only. Rhizome 0.8 – 3 mm in diameter, bract fibers moderately persistent. Pseudobulbs distant, narrowly ellipsoid or obovoid to cylindrical, somewhat flattened or not, 1.8 – 5 × 0.5 – 0.9 cm. Petiole 0.3 – 0.9 cm; lamina elliptic, 3 – 9 × 0.8 – 2.1 cm, rounded to obtuse. Inflorescence erect, 3 – 11 cm, 1-flowered, rarely 2-flowered subumbellate raceme; peduncle 1.7 – 8 cm; bracts 3 or 4, longest 3 – 10 mm; rachis to 0.5 cm; floral bracts ovate, 2.5 – 5 × 1.5 – 4 mm, acute. Flowers fragrant, resupinate, and opening simultaneously. Pedicel and ovary 8 – 10 mm. Dorsal sepal recurved, ovate or triangular, 9 – 14 × 6 – 9 mm, thin, glabrous, entire, acute to acuminate, base narrowly attached; lateral sepals free, oblique, elliptic to ovate, sometimes antrorse widening along lower margin, or triangular, 10 – 14 × 7 – 11 mm, base rather broadly attached, otherwise as of dorsal sepal. Petals recurved, triangular, lower margin decurrent along column foot, 5 – 8 × 2.2 – 4 mm, thin, glabrous, entire, acute to acuminate, base broadly attached; lip ± reflexed slightly over ½ of its length, ± elliptic in general outline, 5.5 – 8 × 5 – 6 mm (all without artificial spreading), very thick; abaxially with a weak retuse median ridge toward base, surface glabrous; adaxially concave and with a median slit with slightly thickened margins toward base, convex but deeply furrowed toward tip, surface slightly rugose toward tip, apex rounded to apiculate. Column 1.8 – 3.2 mm, stigma inside without keels, at its base without teeth, column foot without tooth just above ligament; stielidia deltoid to triangular, 0.3 – 0.8 mm, acute with a minute tooth along upper margin, close to tip, or minutely bifurcate; anther abaxially ± glabrous and with a low, rounded crest; front margin not drawn out, slightly erose.

Flowering: August – October

Distribution: India (Arunachal Pradesh, Assam, Meghalaya), China, Hainan, Hong Kong, Nepal and Vietnam.

Exsiccatae: Chirang Reserve Forest, Assam; 120 m amsl; *Raju Das 10345*, dated 17.12.2009.

Bulbophyllum gracilipes King & Pantling, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 65: 119. 1896. King & Pantling, Ann. Roy. Bot. Gard., Calcutta, 8(2): Pl. 105, 1891. [PLATE - I: H & I]

An epiphyte; perennial herb; rhizome long creeping forming chains of several centimeters, densely rooting along its length. Lacking pseudobulbs. Rhizome thick, c. 2 mm in diameter, bearing remains of sheaths and leaves inserted at intervals of 1 – 2 cm. Leaves solitary from the base, erect, slender, coriaceous, oblanceolate to elliptic-oblanceolate, 5.5 – 7.8 cm x 1.2 – 1.9 cm, obtuse, minutely bifid, base narrowed to short petiole. Inflorescence erect, capitate-globose, 6 to 12 flowered, 0.6 – 1.1 cm across, peduncle slender with lanceolate acute



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sheath; floral bracts ovate, acute. Flowers fleshy, dorsally flattened, uniformly dull purple; dorsal sepal triangular, narrowed to subacute apex, close to column; lateral sepals ovate, rounded, sub-spreading, 3-veined; petals small, linear-oblong, falcate, acute, 1-veined; lip obovate, swollen, decurved from the middle with glandular appearance, entire, tip convex, base deeply grooved; column erect, apices pointed. Capsules 0.2 – 0.5 cm.

Flowering: August – October

Distribution: Endemic; distributed in Darjiling and Sikkim Himalayas and Assam.

Exsiccatae: Chirang Reserve Forest, Assam; 90 m amsl; *Raju Das 10346*, dated 15.11.2010.

Taxonomic notes: According to Seidenfaden (1979), this plant is closely related with *B. xylophyllum* C.S.P. Parish & H.B. Reichenbach from Myanmar. Thus, Seidenfaden (1979) considered those to be conspecific, but King & Pantling (1898) had considered them to be distinct. Seidenfaden noted that the flowers of *B. xylophyllum* were yellowish-green rather than dull purple and that the lateral sepals were rounded rather than acute. Later, these features are confirmed by the drawings of Parish. It was seen that the floral bracts are narrowly lanceolate and acuminate, whereas they are ovate and acute in *B. gracilipes*. Seidenfaden correctly observed that in *B. gracilipes* the dorsal sepal does not have a minute spur at its base. These two species are closely allied but Garay *et al* (1994) treated them distinct.

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