

## Additions to the Orchid flora of Joypur Reserve Forest in Dibrugarh district of Assam, India

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### Abstract

Joypur Reserve Forest in Dibrugarh district of Assam is located within the Himalaya Hotspot for conservation. It is endowed with rich Biodiversity especially in orchids besides other plant species, which is also a part of one of the biodiversity Hotspot. During recent survey 33 species of orchids have been collected as new record for the Joypur Reserve Forest in Assam.

**Key words:** Orchid Flora, Joypur, New Additions, Enumeration

### INTRODUCTION

Joypur Reserve Forest in Dibrugarh District of Assam, India is located between 95°22' E to 95°30' E and 27°00' N to 27°16' N covering a geographical area of 10,876.68 hectares. It forms a part of the world heritage of tropical/ sub-tropical wet evergreen forest, multistoried in structure and rich in biodiversity, more popularly known as 'Rain forest'. The forest is rich in biodiversity and one of the great reservoirs of orchid germplasm due to the area's favorable climatic setup including high rainfall and relative humidity.

During the field study, we collected 101 species of orchids from different parts of the forest, especially from Hukanjuri, Nagfan and Akakhiganga areas. Of these, 68 species were reported earlier by Gogoi *et al* (2009) and 33 more species are now reported here as new record for the orchid diversity of Joypur Reserve Forest. It is amazing to realize that so many species of orchids are growing in such a small area and it is difficult to find out an area parallel to this.

### MATERIALS AND METHODS

The present report is the outcome of several field trips encompassing all the seasons have been carried out in Joypur Reserve Forest during 2009–2010. The specimens were collected in their flowering and fruiting stages and were processed into dried and mounted herbarium specimens following Jain & Rao (1977). Identification were done using standard orchid manuals (Chowdhery 1998; Deorani & Naithani 1995; Deva & Nathani 1968; Hegde 1984; Hooker 1890; Pangtey *et al* 1991; Pradhan 2004; Pradhan 1976, 1979; Seidenfaden 1962, 1973) and by matching at the Herbarium of the Department of Botany, Guwahati University. The Herbarium specimens are deposited in the Herbarium, Department of Botany, Guwahati University. In the enumeration different genera and species are arranged in alphabetical order.

### ENUMERATION

*Anoectochilus roxburghii* (Wallich) Lindley in Royle, Ill. Bot. Himal. 368. 1839. *Chrysobaphus roxburghii* Wallich, Tent. Fl. Nep. 37. t.27. 1826.

Terrestrial, up to 15 cm high; leaves 3 – 5, ovate or ovate-oblong, acute, purplish-brown with a velvety luster, tinged along the center with yellow and pink, and veined yellow; flowers in raceme, 2 – 5, white.

**Flowering:** July – August. **Exsiccatu**s: Joypur, Assam. *Gogoi 0490*, dated 01.05.2010.

***Bulbophyllum ebulbum*** King & Pantling, J. As. Soc. Bengal, LXIV, pt-2: 334. 1898.

Epiphyte; leaves without distinct pseudobulb, 17cm long; inflorescence many flowered; flowers pale green.

**Flowering:** June – July. **Exsiccatu**s: Joypur, Assam..*Gogoi 0492*, dated 02.05.2010.

***Bulbophyllum protractum*** Hooker f., Fl. Brit. India 5: 758, Ic. Pl. 2037, 1890.

Epiphyte; pseudobulbs cylindrical; lamina oblong, acute; inflorescence 2 – 3 flowered; flowers yellowish- white.

**Flowering:** June – July. **Exsiccatu**s: Joypur, Assam. *Gogoi 0491*, dated 01.05.2010.

***Calanthe lyroglossa*** Reichenbach f., Botanica Hamburgensia 53, 1878. [Plate I, Fig. 1]

Terrestrial; pseudobulbs inconspicuous, enclosed by leaf sheaths; leaves 3 – 6, lanceolate-oblong, acuminate, inflorescence 20 – 40 cm long, erect, densely many flowered; flowers yellow.

**Flowering:** November – February. **Exsiccatu**s: Joypur, Assam..*Gogoi 0486*, dated 21.02.2010.

***Cleisostoma aspersum*** (Reichenbach f.) Garay in Bot. Mus. Leafl. Harvard Univ. 23(4): 169. 1972. *Sarcanthus asperses* Reichenbach f.

Epiphyte; stem 8 – 12 cm long; lamina 10 – 15 x 2 – 3 cm; inflorescence extra axillary, many flowered; flowers 0.8 cm across; sepals and petals yellowish, pink tinge with midrib, lip as long as sepals.

**Flowering:** May – August. **Exsiccatu**s: Joypur, Assam..*Gogoi 0511*, dated 20.12.2010.

***Cleisostoma discolor*** Lindley, Bot. Reg. 31, misc 59, 1854.

Epiphyte; lamina oblong, channeled, obliquely truncate; paniced racemes, much longer than leaves; flowers yellow turning to brown.

**Flowering:** June – July. **Exsiccatu**s: Joypur, Assam. *Gogoi 0493*, dated 02.05.2010.

***Cleisostoma filiforme*** (Lindley) Garay in Bot. Mus. Leafl. Harvaed Univ. 23(4): 171. 1972. *Sarcanthus filiformis* Lindley

Epiphyte; stem and leaves terete; inflorescence extra axillary, shorter than leaves; sepals and petals brown with yellowish tinge at the edges and midrib, lip white.

**Flowering:** July – September. **Exsiccatu**s: Joypur, Assam. *Gogoi 0494*, dated 30.05.2010.

***Cleisostoma racemiferum*** (Lindley) Garay in Bot. Mus. Leafl. Harvaed Univ. 23(4): 173. 1972. *Saccolabium racemiferum* Lindley

Epiphyte; leaves strap-shaped, tip bilobed; inflorescence axillary, many-flowered, much longer than leaves; sepals and petals dull-brown, edged with yellow, lip white.

**Flowering:** July – September. **Exsiccatu**s: Joypur, Assam. *Gogoi 0500*, dated 01.06.2010.

***Coelogyne ovalis*** Lindley, Bot. Reg. 24: 91. Misc. 191. 1838.

Epiphyte; leaves in pairs; inflorescence hysteranthous, 2 – 5 flowered racemes, terminal, erect; flowers lemon-yellow.

**Flowering:** August- December. **Exsiccatu**s: Joypur, Assam. *Gogoi, 0485*, dated 21.02.2010.

***Dendrobium stuposum*** Lindley in Bot. Reg. 52, 1838. [ Plate I, Fig. 2]

Epiphyte; inflorescence 1 – 2 flowered short racemes given off from nodes of leafless stems; flowers white, lip with dull yellow blotches.

**Flowering:** June – August. **Exsiccatu**s: Joypur, Assam. *Gogoi 0504*, dated 02.07.2010.

***Eria acervata*** Lindley in J. Hort. Soc. 6. 57. 1851.

Epiphyte; pseudobulb in rows, crowded, narrowly ellipsoid, sheathed when young; inflorescence axillary, 1 – 3; flowers white.

**Flowering:** May- July. **Exsiccatu**s: Joypur, Assam. *Gogoi 0501*, dated 01.06.2010.

***Eria amica*** Reichenbach f., Xen. Orchid.2, 162, t. 168. F. 6-9, 1870. [Plate I, Fig. 3]

Epiphyte; pseudobulbs elongate-clavate; inflorescence lateral, 6 – 12 flowered; flowers pale yellow, with reddish- brown nerves.



**PLATE I:** Orchids of Joypur Reserve Forest. **Fig. 1.** *Calanthe lyroglossa*; **Fig. 2.** *Dendrobium stuposum*; **Fig. 3.** *Eria amica*; **Fig. 4.** *Eria ferruginea*; **Fig. 5.** *Hetaeria affinis*; **Fig. 6.** *Luisia zeylanica*; **Fig. 7.** *Malaxis acuminata*; **Fig. 8.** *Phajus mishmensis*; **Fig. 9.** *Pteroceras suaveolens*; **Fig. 10.** *Taeniophyllum crepidiforme*; **Fig. 11.** *Tainia minor*; **Fig. 12.** *Zeuxine clandestine*.

**Flowering:** March – May. **Exsiccatu**s: Joypur, Assam. *Gogoi 0482* dated 21.02.2010.

*Eria connata* Joseph, Hegde & Abbareddy in Bull. Bot. Surv. India, 24: 114. F. 1-7. 1982.

Epiphyte; pseudobulbs subcylindric, leafless when old; inflorescence axillary or leaf-opposed, racemose globose heads; flowers creamy white, with yellow lip.

**Flowering:** July – August. **Exsiccatu**s: Joypur, Assam. *Gogoi 0480*, dated 14.02.2010.

*Eria ferruginea* Lindley in Bot. Reg. n.s. 25: t. 35. 1839. [Plate I, Fig. 4]

Epiphyte; rhizomatous; leaves 2 – 5, lamina lanceolate, acuminate, thickly coriaceous; inflorescence racemose, 8 – 13 cm long; flowers pink.

**Flowering:** May – June. **Exsiccatu**s: Joypur, Assam. *Gogoi 0507*, dated 04.07.2010.

*Eria pudica* Ridley in J. Linn. Soc. 32: 294. 1896.

Epiphyte; pseudobulbs crowded; leaves solitary; inflorescence lateral, arising from the base of pseudobulb; flowers white, spreading pinkish- buff with darker stripes.

**Flowering:** April- May. **Exsiccatu**s: Joypur, Assam. *Gogoi 0495*, dated 30.05.2010.

*Eria pumila* Lindley, Gen. sp. Orchid. 68. 1830.

Epiphyte; pseudobulbs crowded, subcylindric or clavate; inflorescence axillary, dense capitate head; flowers white, flushed with pink, minute.

**Flowering:** January- March. **Exsiccatu**s: Joypur, Assam. *Gogoi 0502*, dated 01.06.2010.

*Eria tomentosa* (Koenig) Hooker f., Fl. Brit. India 5: 803. 1890. *Epidendrum tomentosum* Koenig

Epiphyte, rhizomatous; pseudobulb ovate-oblong; lamina lanceolate; inflorescence 10 – 15 flowered, tomentose racemes; flowers brown, tomentose.

**Flowering:** September – November. **Exsiccatu**s: Joypur, Assam. *Gogoi 0503*, dated 01.06.2010.

*Hetaeria affinis* (Griffith) Seidenfaden & Ormerod, Oasis, Suppl. 2: 9, 2001. *Goodyera affinis*

Griffith, Not. Pl. Asiat. 3: 391. 1851. [Plate I, Fig. 5]

Terrestrial, 20 – 45 cm long; lamina ovate-elliptic, 5-nerved; racemes many flowered, rachis densely glandular pubescent; flowers white, tipped with pink.

**Flowering:** April- May. **Exsiccatu**s: Joypur, Assam. *Gogoi 0505*, dated 03.07.2010.

*Luisia zeylanica* Lindley, Fol. Orchid. Luisia, 3. 1853. [Plate I, Fig. 6]

Epiphyte; stem stout, terete; leaves terete; flowers in few flowered short spike, greenish yellow, with purple base.

**Flowering:** April – May. **Exsiccatu**s: Joypur, Assam. *Gogoi 0496*, dated 30.05.2010.

*Malaxis acuminata* D. Don, Prodr. Fl. Nepal 29. 1825. [Plate I, Fig. 7]

Terrestrial, 20 – 30 cm high; leaves 3 – 4; racemes terminal, laxly flowered; flowers purple.

**Flowering:** June – July. **Exsiccatu**s: Joypur, Assam. *Gogoi 0499*, dated 01.06.2010.

*Phaius mishmensis* Reichenbach f. in Bonplandia 5: 43. 1857. [Plate I, Fig. 8]

Terrestrial, 50 – 100 cm high; leaves 6 – 8; inflorescence axillary, laxly few flowered; flowers pink.

**Flowering:** November – January. **Exsiccatu**s: Joypur, Assam. *Gogoi 0484*, dated 21.02.2010.

*Phaius tancarervilliae* (Banks ex L' Héritier) Blume, Mus. Bot. Lugd.- Bat. 2: 177. 1856.

*Limodorum tancarvilliae* Banks ex L' Héritier, Sert. Angl. **28. Year ?????**

Terrestrial, 50 – 100 cm high; leaves 5 – 6, 30 – 70 x 6 – 20 cm; Racemes many flowered; flowers 10 – 15 cm across; sepals and petals pinkish outside, yellowish-brown within, with golden margin; lip pink with yellow base.

**Flowering:** November – January. **Exsiccatu**s: Joypur, Assam. *Gogoi 0512*, dated 09.12.2010.

*Podochilus cultratus* Lindley, Gen Sp. Orchid. 234. 1833.

Epiphyte; stem 5 – 15 cm long, clothed with flattened, equitant leaves throughout; flowers in leaf opposed racemes or spikes, white.

**Flowering:** April- May. **Exsiccatus:** Joypur, Assam. *Gogoi*, 0497, dated 30.05.2010.

*Pomatocalpa undulatum* (Lindley) J.J. Smith in Nat. Tijdschr. Ned. Ind. 72: 107. 1912.

*Saccolabium undulatum* Lindley, Gen. Sp. Orch. Pl. 222. 1833.

Epiphyte; stem short; lamina obtusely bilobed; inflorescence many flowered, with minute bracts; flowers yellow, blotched with purple.

**Flowering:** March – May. **Exsiccatus:** Joypur, Assam. *Gogoi* 0498, dated 30.05.2010.

*Pteroceras suaveolens* (Roxburgh) Holttum, in Kew. Bull. 14: 271. 1960. *Aerides suaveolens* Roxburgh [Plate I, Fig: 9]

Epiphyte; lamina obliquely bifid at apex; racemes laxly many flowered, leaf opposed which keep on lengthening to produce flowers at different periods during the year; flowers yellow with brownish spots, lip tip dark purple.

**Flowering:** June – July. **Exsiccatus:** Joypur, Assam. *Gogoi* 0489, dated 22.03.2010.

*Taeniophyllum crepidiforme* (King & Pantling) King & Pantling in Ann. Roy. Bot. Gard. Calcutta 8: 245, t. 325. 1898. *Sarcochilus crepidiformis* King & Pantling [Plate I, Fig. 10]

Small, stemless, leafless, epiphytic herbs devoid of pseudobulbs; roots comparatively thick, flat, greenish; inflorescence short, slender; flowers greenish white with purple tinge.

**Flowering:** August – September. **Exsiccatus:** Joypur, Assam. *Gogoi* 0506, dated 04.07.2010.

*Tainia minor* Hooker f., Fl. Brit. India 5: 821. 1890. [Plate I, Fig. 11]

Terrestrial; pseudobulb narrowly fusiform; leaves narrowly elliptic; inflorescence 7-8 flowered, slightly longer than leaves; flowers purplish brown.

**Flowering:** June- August. **Exsiccatus:** Joypur, Assam. *Gogoi*, 0488, dated 21.03.2010.

*Tainia waryana* (Hooker f.) J.J. Smith in Bull. Jard. Bot. Buitenz. 2, 8: 6. 1912. *Ipsea waryana* Hooker f., Fl. Brit. Ind. 5: 812. 1892.

Terrestrial; stems terete, green; lamina ovate, deeply cordate; petioles stout, terete; inflorescence 2 – 7 flowered, pubescent; flowers greenish flushed with red.

**Flowering:** June – July. **Exsiccatus:** Joypur, Assam. *Gogoi* 0481, dated 21.02.2010.

*Thelasis pygmaea* (Griffith) Lindley in J. Linn. Soc. 3: 63. 1859. *Euproboscis pygmaea* Griffith, Calcutta J. Nat. Hist. 5: 372, t. 26. 1844.

Epiphyte; pseudobulbs with 1 – 2 leaves; lamina linear-oblong, fleshy; racemes laxly flowered, on slender scapes arising from the base of pseudobulbs; flowers pale green.

**Flowering:** July – September. **Exsiccatus:** Joypur, Assam. *Gogoi* 0487, dated 22.03.2010.

*Tropidia curculigoides* Lindley, Gen. Sp. Orchid. 497. 1840.

Terrestrial; 35 – 60 cm high; leaves many; inflorescence few flowered; flowers about 1 cm long, white faintly tinged with yellow.

**Flowering:** September – November. **Exsiccatus:** Joypur, Assam. *Gogoi* 0479, dated 14.02.2010.

*Zeuxine clandestina* Blume, Coll. Orchid. 70. 1858. [Plate I, Fig. 12]

Terrestrial; 10 – 15 cm high; leaves 2 – 4; lamina oblong-ovate; inflorescence few-flowered; flowers pinkish-white.

**Flowering:** January – March. **Exsiccatus:** Joypur, Assam. *Gogoi* 0508, dated 04.07.2010.

*Zeuxine goodyeroides* Lindley, Gen. Sp. Orchid. 486. 1840.

Terrestrial; 10 – 20 cm high; leaves 2 – 4; lamina oblong-ovate; inflorescence few-flowered; flowers green with pinkish tinge, white.

**Flowering:** January- February. **Exsiccatus:** Joypur, Assam. *Gogoi* 0483, dated 21.02.2010.

*Zeuxine longilabris* Trimen in J. Ceylon Br. Roy Asiat. Soc. 9: 90. 1885.

Terrestrial; stem short; leaves 2 – 3 cm; inflorescence few-flowered; flowers purple; sepals green; lip longer than the sepals, mid lobe 2-winged.

**Flowering:** March – May. **Exsiccatus:** Joypur, Assam. *Gogoi* 0509, dated 08.08.2010.

## DISCUSSION

Unique rainforests of North- eastern region, parts of the Western Ghats and in the Andamans are very important and are the rich centers of biodiversity. Joypur Reserve Forest is one such rare jewel in India's forest cover. Characteristic feature of the forest is the stratification of floristic elements in to three distinct canopy structure with its predominant species *Dipterocarpus macrocarpus* Vesque (Dipterocarpaceae) acquiring gigantic heights of over 30 m and girths of over 4 meters. The forest has been the natural home of a wide variety of orchids with 101 species covering 46 genera has been recorded so far from this forest. Out of these 68 species described earlier (Gogoi *et al* 2009) and now 33 more species were found to be new record for the orchid diversity of Joypur Reserve Forest. All the species show resemblance with the earlier description though not mentioned earlier from this area. However, little variation may be occurring due to geographical and ecological conditions.

The growing interests for orchid export, 'biopiracy' and destruction of forests have cumulatively led to a condition of near extinction of many orchid species of this region. Most of the epiphytic orchids are lost due to mass clearance of forests for other developmental activities. Besides, the problem of grazing, some unplanned human activities and interference through collection for ornamental, medicinal and commercial purposes, many terrestrial and saprophytic orchids are now on the verge of extinction. Therefore it is a serious and immediate need to establish an orchid sanctuary with a view for protecting these orchids in this area.

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