

Diversity of *Cleisostoma* Blume [Orchidaceae] in Dibrugarh district of Assam in North East India

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Abstract

The present paper deals seven *Cleisostoma* Blume (Orchidaceae) recorded from the Dibrugarh district of Assam in North-East India. This attempt is the first step to correct taxonomic identification to workout currently accepted botanical names with habitat, phenology and local and general distribution of *Cleisostoma* species in the regions.

Key words: *Cleisostoma* Orchid Species; Diversity; Dibrugarh district, Assam.

INTRODUCTION

Orchids are considered to be the most highly evolved in the floral specialization and diversified form among the monocotyledons. In India orchids form 9 % of the recorded national flora. It is estimated that 25,000 – 35,000 species in 800 – 1,000 genera of Orchidaceae are distributed throughout the world. About 1331 species covering 185 genera of orchids are found in India with temperate Himalayas as their natural home (Misra 2007).

Cleisostoma Blume is one of the important and large of Orchidaceae. The genus described by Carl Bedding Blume in 1825. The generic name is derived from the Greek word “kleislos” (closed) and “stoma” (mouth) referring to the inflated lip and calli which are almost closing the mouth of the spur. It is represented by about 100 species distributed in India, South East Asia, Indonesia, New Guinea, Philippines and Pacific Island to Australia (Chen *et al* 2009). About 19 species are recorded in India (Misra 2007) among those 7 species grow in Dibrugarh district (Gogoi *et al* 2009, 2011; Borah *et al* 2010).

Botanical description

Plants epiphytic or occasionally lithophytic, small to medium-sized, monopodial. Stems to 60 cm long. Leaves dorsiventrally flattened or terete, apex 2-lobed or acute. Inflorescence usually paniculate, erect, horizontal or pendent, few to many-flowered. Flowers small, subtended by small bracts. Sepals and petals similar, free, spreading. Lips 3-lobed, saccate to spurred, with a callus on the back wall and often with outgrowths on the front wall closing the entrance; spur with or without a septum. Column short and stout, lacking a foot; viscidium variable, small and subglobose to broad and horseshoe-shaped; pollinia 4, appearing as 2 unequal masses.

MATERIALS AND METHOD

The present investigation is the outcome of several field trips encompassing all the season have been carried out in the Dibrugarh district of Assam during 2006 – 2012. The specimens were collected in their flowering stages and were processed into dried and mounted herbarium speci-

164 *Cleisostoma* Blume in Dibrugarh district of Assam
mens following Jain & Rao (1977). Specimens were described, properly identified and authenticated with the help of different literature including King & Pantling (1898), Chowdhery (1998), Lindley (1830-1840), Pradhan (1979), Misra (2007) and Lucksom (2007). Identities of the specimens were confirmed by matching at the Herbarium of the Department of Botany, Guwahati University. After the works are over, specimens will be deposited in the same herbarium.

ENUMERATION

Cleisostoma appendiculatum (Lindley) Bentham & Hooker *f. ex* Jackson, in Index Kewensis 1: 555. 1895. *Aerides appendiculata* Lindley, Gen. Sp. Orchid. Pl.: 242. 1833. [Plate I, Fig. 1]

Epiphyte; stem erect, 20 – 40 cm long, flexuous; leaves terete, 7 – 10 cm long, spirally arranged, ascendant; inflorescence few flowered, longer than leaves, decurved; flowers lax, about 1.5 cm across.

Flowering: August – October. **Exsiccatae:** Joypur, Gogoi *et al* 0150, dated 26.07.2007.

Habitat: Epiphytic on tree trunks in evergreen forests.

General distribution: India, Myanmar.

Cleisostoma filiforme (Lindley) Garay in Bot. Mus. Leafl. Harvard Univ. 23(40): 171. 1972. *Sarcanthus filiformis* Lindley in Bot. Reg. 28: misc. 61, no. 69. 1842. [Plate I, Fig. 2]

Plants pendent, 27 – 42 cm long; stem 2 – 3.5 mm thick; leaves 15 – 26 x 0.2 – 0.3 cm, terete, rugose, subacute, sessile; inflorescence lateral, usually opposite to leaves, racemose, laxly 9 to 22-flowered. Flowers 0.6 – 0.7 cm across.

Flowering: April – June. **Exsiccatae:** Joypur, Gogoi *et al* 0494, dated 30.05.2010.

Habitat: Epiphytic on tree trunks in broad-leaved evergreen forests.

General distribution: NE India, Myanmar, Nepal, Thailand, Vietnam.

Cleisostoma linearilobulatum (Seidenfaden & Smitinand) Garay in Bot. Mus. Leafl. 23(4): 172. 1972. *Sarcanthus linearilobulatus* Seidenfaden & Smitinand, Orchid Thailand 4(2): 684, f. 506. 1965. [Plate I, Fig. 3]

Plants 13 – 26 cm tall; stem covered with leaf sheaths; leaves 6 – 11.5 x 1.5 – 2 cm, distichous, apex unequally 2-lobed, lobules rounded; inflorescence 7 – 9.5 cm long, lateral, paniculate, laxly many-flowered; flowers 3.8 – 5.5 mm across.

Flowering: May – July. **Exsiccatae:** Joypur, Gogoi *et al* 0493, dated 02.05.2010.

Habitat: Epiphytic on tree trunks in evergreen forests.

General distribution: N.E. India, Bhutan.

Cleisostoma paniculatum (Ker-awler) Garay, Bot. Mus. Leafl. 23: 173. 1972. *Aerides paniculata* Ker-Gawler, Bot. Reg. 3: ad t. 220. 1817.

Plants erect, compressed-terete, elongate, over 20 cm long; leaves 10 – 25 x 0.8 – 2 cm, distichous, flat, narrowly oblong or linear, leathery, unequally bilobed, sometimes mucronate in sinus; inflorescence axillary, much longer than leaves, many branched, many flowered; flowers opening widely.

Flowering: September – February. **Exsiccatae:** Joypur, Gogoi *et al* 0511, dated 20.12.2010.

Habitat: Epiphytic on tree trunks in broad-leaved evergreen forests.

General distribution: India, Nepal, Bhutan, Myanmar, China (Yunnan), Thailand, Vietnam.

Cleisostoma racemiferum (Lindley) Garay in Bot. Mus. Leafl. Harvard Univ. 23(4): 173. 1972. *Saccolabium racemiferum* Lindley, Gen. Sp. Orchid. Pl.: 224, 1833. [Plate I, Fig. 4]



PLATE I: Different species of *Cleisostoma* recorded from the Dibrugarh district of Assam. **Fig. 1.** *C. appendiculatum*; **Fig. 2.** *C. filiforme*; **Fig. 3.** *C. linearilobulatum*; **Fig. 4.** *C. racemiferum*; **Fig. 5.** *C. simondii*; **Fig. 6.** *C. subulatum*.

166 *Cleisostoma* Blume in Dibrugarh district of Assam

Plants 18 – 27 cm tall; leaves 5 – 9, 15 – 30 x 2.5 – 3.4 cm, oblong, spreading, coriaceous, apex unequally 2-lobed; inflorescence lateral, leaf-opposite, 14 – 18 cm, paniculate, laxly many-flowered; flowers 0.7 – 0.8 cm across.

Flowering: July – September. **Exsiccatae:** Joypur, Gogoi *et al* 0500, dated 01.06.2010.

Habitat: Epiphytic on tree trunks in evergreen forests.

General distribution: India, Nepal, Bhutan, Myanmar, China (Yunnan), Thailand, Vietnam.

Cleisostoma simondii (Gagnepain) Seidenfaden in Dansk Bot. Arkiv 29(3): 66. 1975. *Vanda simondii* Gagnepain in Bull. Mus. Natl. Hist. Nat. ser. 2, 22: 628. 1950. [Plate I, Fig. 5]

Plants 20 – 38 cm tall; stem erect; leaves 5 – 8 x 0.1 – 0.2 cm, terete, fleshy, linear, apex subacute to obtuse, sessile, jointed; inflorescence extra-axillary, pendent, long, simple or paniculate, laxly 10 to 18 flowered; flowers 6.5 – 9 mm across.

Flowering: August – October. **Exsiccatae:** Joypur, Gogoi *et al* 0221, dated 26.09.2008.

Habitat: Epiphyte on thick-barked tree trunks in deciduous lowland dipterocarp forests.

General distribution: India (N.E.), China, Thailand, Vietnam.

Cleisostoma subulatum Blume, Bijdr. 363. 1825. [Plate I, Fig. 6]

Plants pendent; stem 10 – 30 cm long, slender; internodes 1.5 – 1.8 cm; roots 3 – 4 mm thick; leaves 8.5 – 16 x 0.8 – 1.1 cm, distichous, fleshy, linear-oblong to oblong-lanceolate; inflorescence lateral (axillary), pendent, racemose, laxly 7 – 18-flowered; flowers 5 – 7 mm across, scentless.

Flowering: May – June. **Exsiccatae:** Joypur, Gogoi *et al* 0097, dated 12.06.2006; Jakoi, Gogoi *et al* 0120, dated 27.08.2007.

Habitat: Epiphyte on tree trunk in dense humid evergreen forest.

General distribution: Himalayas, India, Bangladesh, China, Taiwan, Yunnan, Cambodia, Philippines, Malaysia, Myanmar, Thailand, Vietnam, Java and Sumatra.

RESULTS AND DISCUSSION

Out of the seven species of *Cleisostoma* Blume (Orchidaceae) recorded from the Dibrugarh district of Assam *Cleisostoma subulatum* is very common and *Cleisostoma appendiculatum*, *Cleisostoma filiforme*, *Cleisostoma linearilobatum*, *Cleisostoma paniculatum* *Cleisostoma racemiferum*, *Cleisostoma simondii* are rare in the region. It is observed that, felling of epiphytic host-trees causes drastic loss of epiphytic orchid-species including *Cleisostoma*. Therefore, conservation of trees in the habitat is the most important way to save our precious Orchid resources in the study area.

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