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Cymbidium dayanum and *Cymbidium sinense* (Orchidaceae): two new additions to the orchid wealth of Manipur, India

Sanjeet Kumar*, Puyam Devanda Singh, Huidrom Sunitibala Devi, Biseshwori Thongam, Bharat Gopalrao Somkuwar & Sunil Shriram Thorat

Institute of Bioresources and Sustainable Development, Imphal-795001, Manipur, India
* corresponding author: sanjeet.biotech@gmail.com

Abstract

Two orchid species, *Cymbidium dayanum* and *Cymbidium sinense*, have been detected and collected for the first time from the Indo-Burma Biodiversity hotspot of Manipur, India. They are described and illustrated to facilitate their identification.

Résumé

Deux espèces d'orchidées, *Cymbidium dayanum* et *Cymbidium sinense*, ont été découvertes et collectées pour la première fois dans le Manipur, en Inde. Elles sont sont décrites et illustrées pour aider à leur identification *in situ*.

Keywords: conservation, geographical distribution, Indo-Burma Biodiversity Hotspot, Kamjong.
Mots clés : biodiversité, conservation, distribution géographique, Kamjong.

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Cymbidium Swartz is one of the most common genera of the family Orchidaceae in India and mainly found in the biodiversity hotspots of the country (Indo-Burma Biodiversity Hotspot, Eastern Himalaya, Western Ghats and Sundaland, according to Nahar *et al.,* 2017). The genus is comprised of about 92 species distributed mainly in India, Southeast Asia, China, Japan and Indonesia to Australia (Chowlu *et al.,* 2015). In India, about 31 species of *Cymbidium* were reported (Kumar & Kumar, 2005; Misra, 2007; Chowlu *et al.,* 2015), among which 17 from Manipur (Linthoinganbi *et al.,* 2014). During the survey of Orchid species of the Indo-Burma Biodiversity Hotspot of Manipur in November 2017, under the project "Orchid bioresources of the North-East India-Conservation, database development and information networks", we found a rich population of two *Cymbidium* species near the town of Kamjong (25° 00" 53" N & 94° 19' 7.6" E; 1408 m), Manipur. These taxa have been identified as *Cymbidium dayanum* Reichenbach f. and *Cymbidium sinense* (G. Jackson) Willdenow. two species not yet recorded for the region. Detailed descriptions, together with photographs, are provided for easy identification in the field.

Material and methods

Six plants of *Cymbidium dayanum* (OBDD-IBSD-K-C-01 to OBDD-IBSD-K-06) and seven plants of *C. sinense* (OBDD-IBSD-K-C-07 to OBDD-IBSD-K-13) were collected in the Kamjong district, and kept in the National Bioresources Park, Haraorou, Imphal East, Manipur, for *ex-situ* conservation. Material was taken from the collected plants and deposited as herbarium specimens in the Bioresources Database and Bioinformatic division, at IBSD (Institute of Bioresources and Sustainable Development), Imphal.

All plant parts were photographed, and the images were analysed using Adobe Photoshop. The plant identification was based on the critical observation of their morphology and key characters (as found in Deva & Naithani, 1986; Chowdhery, 1998; Pearce & Cribb, 2002; Lui *et al.,* 2006; Lucksom, 2007; Chen *et al.,* 2009; Chowdhery, 2009) and the consultation of the flower images from different social network groups (e.g. The Flora: an initiative of Ambika Prasad Research Foundation & Indian Flora).

Results

***Cymbidium dayanum* Reichenbach f.**

The Gardeners' Chronicle 1869: 710 (1869). Section *Himantophyllum* Schlechter (1924)

Synonyms: *Cymbidium acutum* Ridley (1896), *Cymbidium alborubens* Makino (1902)

Description: terrestrial herb up to about 55 cm tall; pseudobulbs cylindrical, concealed by overlapping leaf sheaths ; leaves 5-7, distichous, linear, 50.0-55.5 cm long, 6.0-6.2 mm wide, green, acute at the apex, basally narrowed and articulated to the sheaths ; peduncle produced from the base of the pseudobulb, 25-30 cm long, with overlapping, ovate-lanceolate, 7-9 cm long steril bracts; floral bracts ovate, 6 mm long, pedicel 3-4 cm long; flowers many, 3.8-4.0 cm diameter, whitish with reddish median bands; sepals oblanceolate, 2.6-3.6 cm long, 6-7 mm wide, acute; petals similar to sepals and shorter; lip distinctly 3-lobed, 1.0-1.1 cm long; column reddish; fruit 5.8-6.6 cm long, 2.0-2.3 cm diam. (Fig.1).

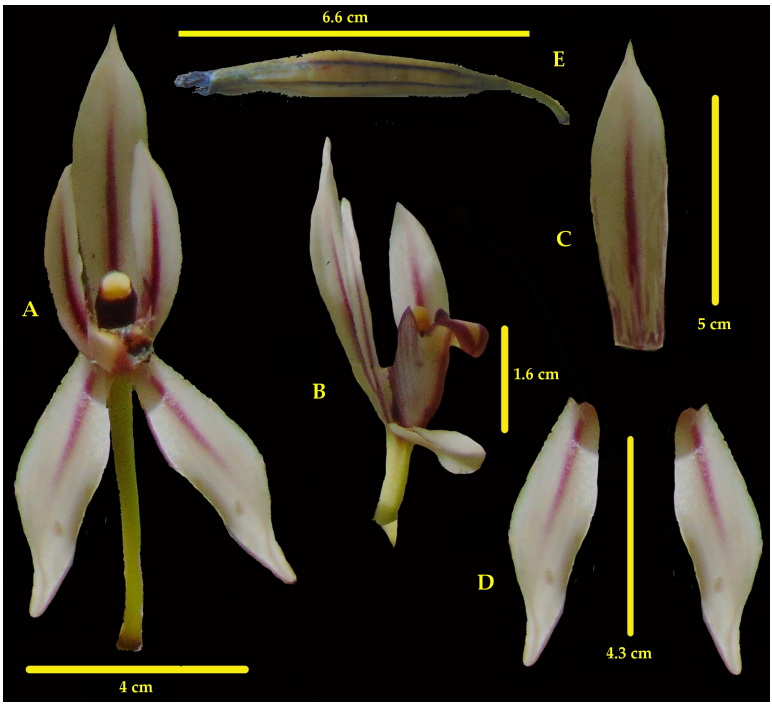

Fig. 1: Floral parts of *Cymbidium dayanum*

A: Flower, B: Petals and lip, C: Dorsal sepal, D: Lateral sepals, E: Fruit

Distribution: India (Assam, eastern Himalayas, Sikkim, Uttarkhand, Arunachal Pradesh, Western Himalayas, Manipur), Myanmar, Nepal, Bhutan, Thailand, Vietnam and China (Chowlu *et al.,* 2015).
Flowering time: October-December.
Habitat: evergreen forest and moist deciduous forest.
Note: the observed visible threats were overgrazing in forest ranges and deforestation of moist deciduous forest.

***Cymbidium sinense* (G. Jackson) Willdenow**
Species Plantarum. Editio quarta 4: 111 (1805)
Synonyms: *Cymbidium fragrans* R.A. Salisbury (1812), *Cymbidium albojucundissimum* Hayata (1914)
Description: terrestrial plant; pseudobulbs ovoid, 2.5-6 × 1.5-2.5 cm, enclosed in leaf bases; leaves 3-5, green, 45-59 cm long, 1.8-2.1 cm wide, leathery, articulate; inflorescence arising from the pseudobulb base, 50-90 cm long, rachis 10-20 flowered; floral bracts 4-8 mm long; flowers fragrant, 5.4 cm diam., variable in colour, purple with a paler lip; sepals oblong, 1.7-2.6 cm long, 0.7 cm wide, apex acute; petals ovate, 3.6 cm long, 0.5 cm wide, apex acute; lip ovate-oblong, 1.1 cm long; column slightly arcuate; fruit ellipsoid, 5.5 cm long, with a 1.9 cm long stalk (Fig. 2).

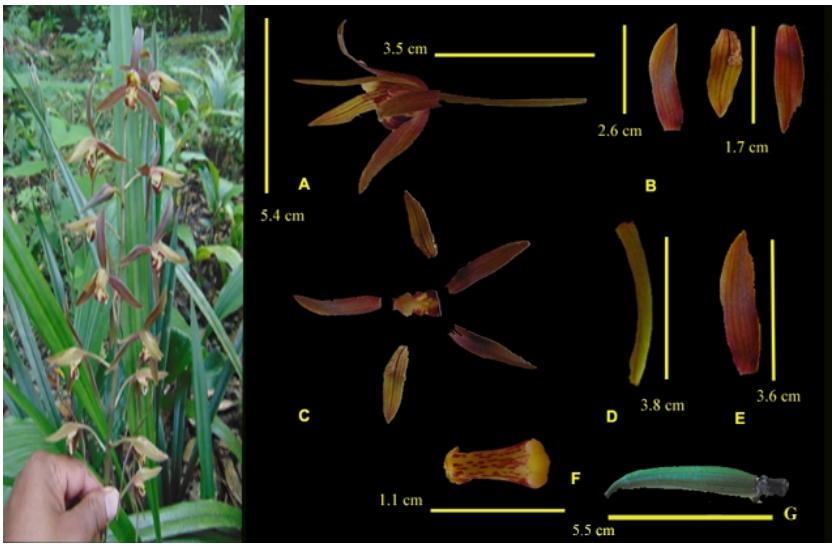

Fig. 2. *Cymbidium sinense* (left: *in situ;* right: floral parts)
A: Flower, B: Sepals, C: Petals & Sepals, D: Peduncle, E: Petal, F: Lip, G: Fruit

Distribution: India (Sikkim, Uttarkhand, Arunachal Pradesh, Western Himalayas, Manipur, Assam, eastern Himalayas), Thailand, Vietnam, China, Myanmar, Nepal, Bhutan (Lu *et al*., 2011; Iwatsuki *et al*., 2016).
Flowering time: October –December. Habitat: evergreen forests.
Note: the noted threats from the field were over extraction of plant for the ornamental purpose by local communities.

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