

On the first record of *Calanthe lamellosa* (Orchidaceae) from India with notes on typification

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Abstract: *Calanthe lamellosa* Rolfe (Orchidaceae) is reported here for the first time from India and a detailed description, photographs and drawing are provided. Its affinity with *Calanthe brevicornu* Lindl. is discussed and a lectotype is designated for *C. lamellosa* from the available original material (syntypes). Further, a lectotype is designated for *Calanthe yunnanensis* Rolfe, a heterotypic synonym of *C. lamellosa*.

Keywords: *Calanthe brevicornu*, *Calanthe yunnanensis*, Japfu mountain, Lectotype, Nagaland, New record.

Introduction

Calanthe R.Br., a genus of almost exclusively terrestrial orchids with *c.* 216 species (Chase *et al.*, 2015), is distributed in tropical and subtropical Asia across to Japan, and southwards and eastwards through Malaysia, Indonesia, New Guinea, Australia and the Pacific Islands, east to Tahiti, tropical and South Africa, Madagascar, the islands of the Indian Ocean and in Central and South America and the Caribbean (Clayton & Cribb, 2013). The generic name is derived from the Greek words ‘*kallos*’ (= beautiful) and ‘*anthos*’ (= flower), referring to the beautiful flowers of most of the species in the genus. Bhattacharjee and Agrawala (2022) reported 22 species and two doubtful, imperfectly recorded species of the genus from India. During floristic surveys on the Japfu mountain in Kohima district of Nagaland, India, in April 2022, a species of *Calanthe*, similar to *C. brevicornu* Lindl. was found

scattered in five subpopulations containing 450 to 500 mature individuals. However, after a detailed study of a few collected specimens, the species was identified as *C. lamellosa* Rolfe. No anthropogenic threat was observed for the species in the collecting locality during the survey. *C. lamellosa* was reported to be endemic to China (Clayton & Cribb, 2013), until Kurzweil and Ormerod (2019) reported it from Myanmar. However, the data is not updated yet on the website of ‘Plants of the World Online’ (POWO, 2022) where it is still treated as endemic to China.

The present finding constitutes a new distributional record of *C. lamellosa* for India. A detailed description, photographs, and a line drawing are provided to facilitate the identification of this beautiful but uncommon species. Further, lectotypes are designated for *C. lamellosa* and *C. yunnanensis* Rolfe (a heterotypic synonym of *C. lamellosa*).

Taxonomic Treatment

Calanthe lamellosa Rolfe, Bull. Misc. Inform. Kew 1896: 197. 1896; D.A. Clayton & P.J. Cribb, Gen. *Calanthe*: 135. 2013. *Lectotype* (designated here): CHINA, **Hupeh** (Hubei), Chienshih, *A.Henry* 5958 (K [K000810922 digital image!]; isolecto GH [GH00060388], P [P00378965] digital images!).

Calanthe yunnanensis Rolfe, J. Linn. Soc. Bot. 36: 27. 1903. *Lectotype* (designated here): CHINA, **Yunnan**, Mengtze (Mengtze), 8–9000 ft, 9 May ’96 (09.05.1896), *W. Hancock* 589 (K [K000810916

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digital image!]); residual syntypes: **Yunnan**, Mengtze, N. mts. forests at 8000 ft, *s.d.*, *A. Henry* 11107 (K [K000810914, K000810915], E [E00383597], NY [00008615, 00008616], Z [Z00006494], US [00322840] digital images!).

Figs. 1, 2 & 3a

Plants 28–60 cm tall. Pseudobulbs ovoid, 2–2.5 × 1.2–2 cm. Stem thick, 5–10 cm long, encircled by leaf-bases. Leaves 2–5, lamina oblong-elliptic to oblong-obovate, 10–30 × 5–10 cm, green, acute to acuminate at apex, petiole sheathing at base. Inflorescence longer than leaves, 20–36 cm long; rachis laxly 7 to 20-flowered, puberulent. Floral bracts narrowly lanceolate, shorter than pedicel plus ovary, almost glabrous, acute to acuminate at apex. Flowers 3–4 cm long, with fragrance of grated coconut, sepals and petals white to pale greenish-yellow, labellum white with pinkish-mauve tinge. Pedicel plus ovary 1.5–2 cm long, often curved, pale yellowish-green, puberulent. Dorsal sepal ovate-lanceolate, 1.5–2 × 0.5–0.8 cm, 3-veined, acute at apex; lateral sepals oblong-elliptic to oblong-lanceolate, 1.6–2.1 × 0.4–0.6 cm, 3-veined, acute at apex. Petals narrowly elliptic, 1.4–1.7 × 0.3–0.4 cm, 3-veined, acute at apex. Labellum 1.3–1.6 cm long, 3-lobed; side-lobes broadly oblong, 0.6–0.7 × 0.26–0.32 cm, spreading; mid-lobe entire, obovate to obcordate, 0.9–0.11 × 0.7–0.8 cm, with a distinct apiculus at apex; callus with 3 fleshy, irregular, raised keels running from lip base to just below its apex; spur 0.2–0.34 cm long, with many hairs at its mouth, obtuse at apex. Column adnate to the labellum for half its length, *c.* 0.4 cm long. Anther broadly ovate, 0.3–0.35 × 0.25–0.3 cm, dull-white to yellowish-white; pollinarium *c.* 0.3 cm long; pollinia 8, in 2 groups each with 4, oblong-ovate, *c.* 0.1 cm long, sometimes slightly oblique, sub-equal, yellow; caudicles reduced; viscidium oblong to sub-quadrangle, dark brown at maturity. Capsules ellipsoid, 2–3.2 × 1–1.5 cm, pendent, brownish towards maturity, 4-ridged.

Flowering & fruiting: We observed both flowers and fruits during April (in India).

Habitat: Terrestrial, found in temperate broad-leaved forest in association with *Castanopsis indica* (Roxb. ex Lindl.) A.DC. (Fagaceae), *Clematis manipurensis* (Bruhl) W.T.Wang (Ranunculaceae),

Elaeagnus sp. (Elaeagnaceae), *Laportea bulbifera* (Siebold & Zucc.) Wedd. (Urticaceae), *Lithocarpus pachyphyllus* (Kurz) Rehder (Fagaceae), *Maianthemum fuscum* (Wall.) LaFrankie (Asparagaceae), *Rhododendron elliottii* Watt ex Brandis (Ericaceae), *Symplocos* sp. (Symplocaceae) and others, at *c.* 2345 m elevation.

Distribution: China, India and Myanmar.

Etymology: The specific epithet is derived from the Latin ‘*lamellosus*’ (with lamellae, *i.e.*, composed of or arranged in layers or thin plates) in reference to the callus on the mid-lobe of the labellum with lamellate keels.

Specimens examined: INDIA, Nagaland, Kohima district, Japfu mountain range, *c.* 2345 m, 29.04.2022, Moaakum & Santanu Dey MKN-1011 (CAL).



Fig. 1. *Calanthe lamellosa* Rolfe: **a.** Plants in their natural habitat; **b.** Portion of rachis showing flowers from different angles (photos by Santanu Dey).

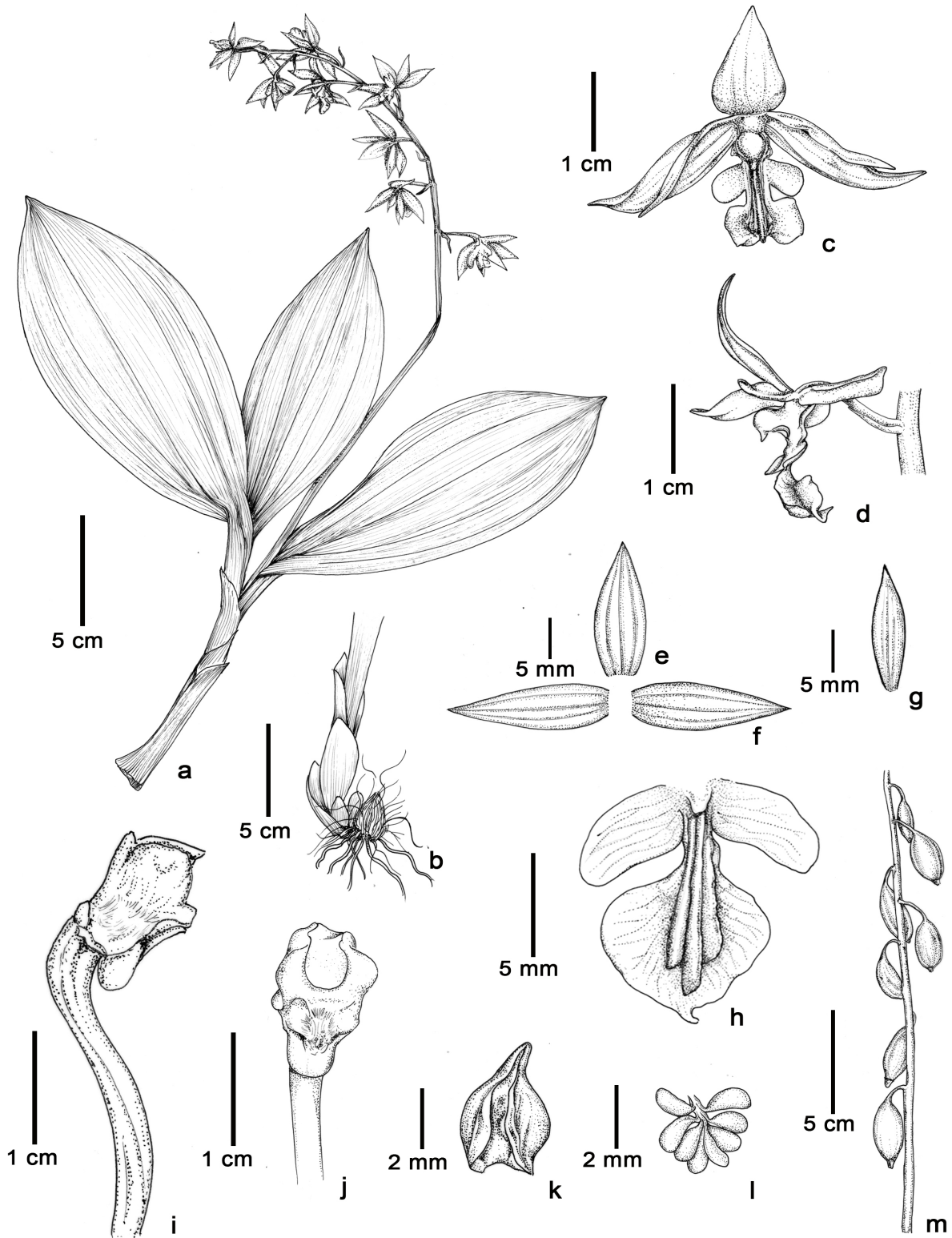


Fig. 2. *Calanthe lamellosa* Rolfe: **a.** Habit; **b.** Portion of stem showing pseudobulb with roots; **c.** Flower—front view; **d.**; Flower—side view; **e.** Dorsal sepal; **f.** Lateral sepals; **g.** Petal; **h.** Labellum; **i.** Column and labellum base—side view, with portion of pedicel plus ovary; **j.** Column and labellum base—front view, with portion of pedicel plus ovary; **k.** Anther; **l.** Pollinarium; **m.** Portion of rachis with capsules (drawn by Dineshwar Kumar Sah, from *Moaakum & Santanu Dey* MKN-1011).

Notes: *Calanthe lamellosa* was treated as conspecific with *C. brevicornu* by several authors (Pearce & Cribb, 2002; Lucksom, 2007; Chen *et al.*, 2009). However, *Calanthe lamellosa* was reinstated by Clayton and Cribb (2013) which was supported by Kurzweil and Ormerod (2019). We also confirm its distinctness from *C. brevicornu* based on our study of live plants in the field and herbarium specimens (including the types) of both species. *Calanthe lamellosa* is morphologically close to *C. brevicornu* but can be distinguished in having white to pale greenish-yellow sepals and petals, white labellum with pinkish-mauve tinge, dull white to yellowish-white anther and the mid-lobe

of the labellum with a distinct apiculus at the apex. The sepals and petals of *C. brevicornu* are basally white and marked with dark reddish or maroon lines, or sometimes dark reddish or maroon throughout except for the white base, the labellum is white marked with purple or maroon, the anther is pinkish-white (Fig. 3b), and the mid-lobe of the labellum has an emarginate apex. Further, the lamellate keels on the labellum are narrower but much elevated in *C. lamellosa* than those of *C. brevicornu*. Lucksom's (2007) treatment of *C. lamellosa* as a synonym of *C. brevicornu* is erroneous, because Lucksom's plants (under the name *Calanthe brevicornu*) from Sikkim are actually *C. brevicornu* and not *C. lamellosa*, which is evident from the description, illustration and photographs provided by Lucksom (2007). Though Clayton and Cribb (2013) and Kurzweil and Ormerod (2019) considered the shape of the sepals and petals as one of the distinguishing characteristics of these two species, we found it a little variable and overlapping as we observed ovate-lanceolate to oblong-elliptic to oblong-lanceolate sepals and narrowly elliptic petals in *C. lamellosa*, and oblong-lanceolate sepals and narrowly elliptic to rhomboid petals in *C. brevicornu*.

Notes on the lectotypification of *Calanthe lamellosa*

While describing *Calanthe lamellosa*, Rolfe (1896) cited the specimens (types) as "HAB.-Hupeh: Chienshih, A. Henry, 5958". During our study, we found three duplicates of this collection at GH, K and P. Pearce and Cribb (2002), Clayton and Cribb (2013), and Kurzweil and Ormerod (2019) cited the specimen at K as the holotype of *C. lamellosa*. However, it is a syntype as Rolfe did not mention any particular specimen as type or holotype. Further, the type citation in the three publications is not a correctable error, *i.e.*, cannot be corrected from the holotype to the lectotype according to Art. 9.10 of the ICN (Turland *et al.*, 2018), as they did not intend to designate a lectotype in their publications and did not use the term 'designated here' or '*hic designatus*' or something equivalent to it, which is mandatory as of 1st January 2001 for a valid lectotypification as per the Art. 7.11 of the ICN (Turland *et al.*, 2018).



Fig. 3. Flowers of species of *Calanthe* R.Br.: a. *Calanthe lamellosa* Rolfe; b. *Calanthe brevicornu* Lindle. (photos a by Santanu Dey; b by Avishek Bhattacharjee).

Hence, the specimen at K (K000810922) is designated here as the lectotype of *Calanthe lamellosa* according to the Art. 9.3 of the ICN (Turland *et al.*, 2018) to stabilize the typification of the name.

Notes on the lectotypification of *Calanthe yunnanensis*

Rolfe (1903) cited the types of *Calanthe yunnanensis* Rolfe as – “YUNNAN: Mengtze, mountain forests at 8000–9000 ft. (Hancock, 589!), Flowers creamy green, with lilac lip; fragrant of grated cocoa-nut; mountain forests at 8000 ft. (A. Henry, 11107!). Herb. Kew.” During our study, we could locate eight syntypes in total at E, K, NY, US and Z. Among them, only one specimen at K is a Hancock 589 collection (K000810916), whereas all the remaining specimens are of A. Henry 11107. On the label of the specimen at K, Rolfe wrote “Flowers cream green with lilac lip. Fragrant of grated coconut” which is also written in the protologue. Further, this specimen at K has three plants with leaves and several flowers which supports the description published in the protologue. Hence, this specimen (K000810916) is here designated as the lectotype of *C. yunnanensis* in accordance with Art. 9.3 of the ICN (Turland *et al.*, 2018), which was cited by Clayton and Cribb (2013) and Kurzweil and Ormerod (2019) as syntype.

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with focus on micro-morphology of pollinia; File no. SB/FT/LS-397/2012]. The authors also express sincere thanks to Mr. Dineshwar Kumar Sah (Artist, Central National herbarium) for the illustration. The authors are thankful to the authorities of E, GH, K, NY, P, US, Z for facilitating with the digital images of specimens on the websites of their herbaria.

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