



## *Dendrobium gopalanii* (Orchidaceae): A new species from Kerala, Western Ghats, India

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**ABSTRACT:** *Dendrobium gopalanii* (Orchidaceae), a new lithophytic species from Agasthyarkoodam in the Western Ghats of Kerala (India), is described and photographed. It differs from similar species of *Dendrobium heyneanum* Lindl., *D. panduratum* Lindl., *D. panduratum* subsp. *villosum* Gopalan & A.N.Henry and *D. wightii* A.D.Hawkes and A.H.Heller have a cylindrical stem, leathery leaves, obliquely acute apex, 1–4 flowers, sepals and petals apex obtuse, minutely crenulate margin of petals, lip midlobe orbicular, margin undulated, retuse apex with minutely mucronated in middle, bilobed callus of disc, and obtuse apex.

**KEY WORDS:** Agasthyamala, *Dendrobium heyneanum*, *D. panduratum*, *D. wightii*, orbicular lip, *Stachyobium*.

### INTRODUCTION

The flora of the Western Ghats is recognized for its high level of diversity with endemism and is featured as one of the most important biodiversity hotspots in the World (Myers *et al.*, 2000). The Indian *Orchidaceae* accounts for 1289 taxa under 155 genera, among which *Dendrobium* Sw. is diversified as the second largest genera. During a botanical exploration (2020–2021) of the Agasthyamala Biosphere Reserve, Kerala an interesting specimen of *Dendrobium* belonging to section *Stachyobium* Lindl. was collected and located in an abundant population with a flowering stage. On a critical morphological characterization of this taxon, identification has been processed based on the types of similar species and comparative study with the specimens housed at Indian herbaria (CAL, CALI, MH, KFRI & TBGRI) and the virtual herbaria (K, P, E); different literatures (Abraham and Vatsala, 1981; Joseph, 1987; Misra, 2007; Pradhan, 1976; Sabapathy, 2013; Santapau and Kapadia, 1966; Singh *et al.*, 2019). As a result, the current study confirmed that the taxon is distinct from the previously known *Stachyobium* group under the *Dendrobium* genus and belongs to a previously unknown species. Hence, it is described here as a new species, *Dendrobium gopalanii* M.Sulaiman & Murugan.

### MATERIALS AND METHODS

With the help of the forest workforce, a frequent survey on different seasons is carried out in the study area. The species were located along with geo-coordinates using GPS (Garmin etrex10) and good images captured by Canon D5600. The populations of the species were documented in the data collection note book. The description and measurements were based on fresh and herbarium materials. The newly described species was

identified using standard monographs, revisions, state floras, district floras, and literature. An assessment of conservation status was carried out according to IUCN (2014).

### TAXONOMIC TREATMENT

*Dendrobium gopalanii* M.Sulaiman & Murugan, *sp. nov.*

**Fig. 1**

**Type:** INDIA, Kerala, Thiruvananthapuram, Agasthyamala Biosphere Reserve, Agasthyarkoodam (8°37'10" N, 77°14'58" E), 1601 m, 25<sup>th</sup> March 2021, M. Sulaiman 145478 (holotype CAL!; isotypes MH!, CAL!).

**Diagnosis:** *Dendrobium gopalanii* is similar to *D. heyneanum* Lindl., *D. panduratum* Lindl., *D. panduratum* subsp. *villosum* Gopalan & A.N.Henry and *D. wightii* A.D.Hawkes & A.H.Heller, but differs in the presence of a cylindrical stem; leathery leaves with an obliquely acute at apex; flowers small, 1–4 flowers, sepals and petals apex obtuse, margin of the petals minutely crenulate at apical part; midlobe of the lip orbicular, undulate, retuse at apex with minutely mucronated in middle; callus of disc bi-lobed and apex obtuse. (Table 1)

**Description:** Lithophytic herbs, up to 15 cm high. Stem 5–7 × 0.5–0.7 cm, coriaceous, erect, cylindrical, scattered pale green or brownish yellow, young leafy stem arise from anterior portion of stem. Leaves 3–8, 2–3.5 × 0.4–0.6 mm, linear-lanceolate, flattened, sessile, incurved, leathery, sheathing at base, pale brownish abaxially, brownish green or green adaxially, apex obliquely acute. Inflorescence a raceme, terminal, 2–4 cm long, 1–4 flowers; peduncle 1.5–2 cm long, cylindrical, reddish brown. Bracts ovate, 2–4 × 2.5–3.5 mm, entire, apex obtuse. Flowers small, 2.4–4 × 2.6–3 cm across, tepals white, lip white, middle pale pinkish. Dorsal sepal oblong, 4–4.5 × 1.7–1.9 mm, 3-veined, scattered gland dotted, apex obtuse; lateral sepals oblong-lanceolate,

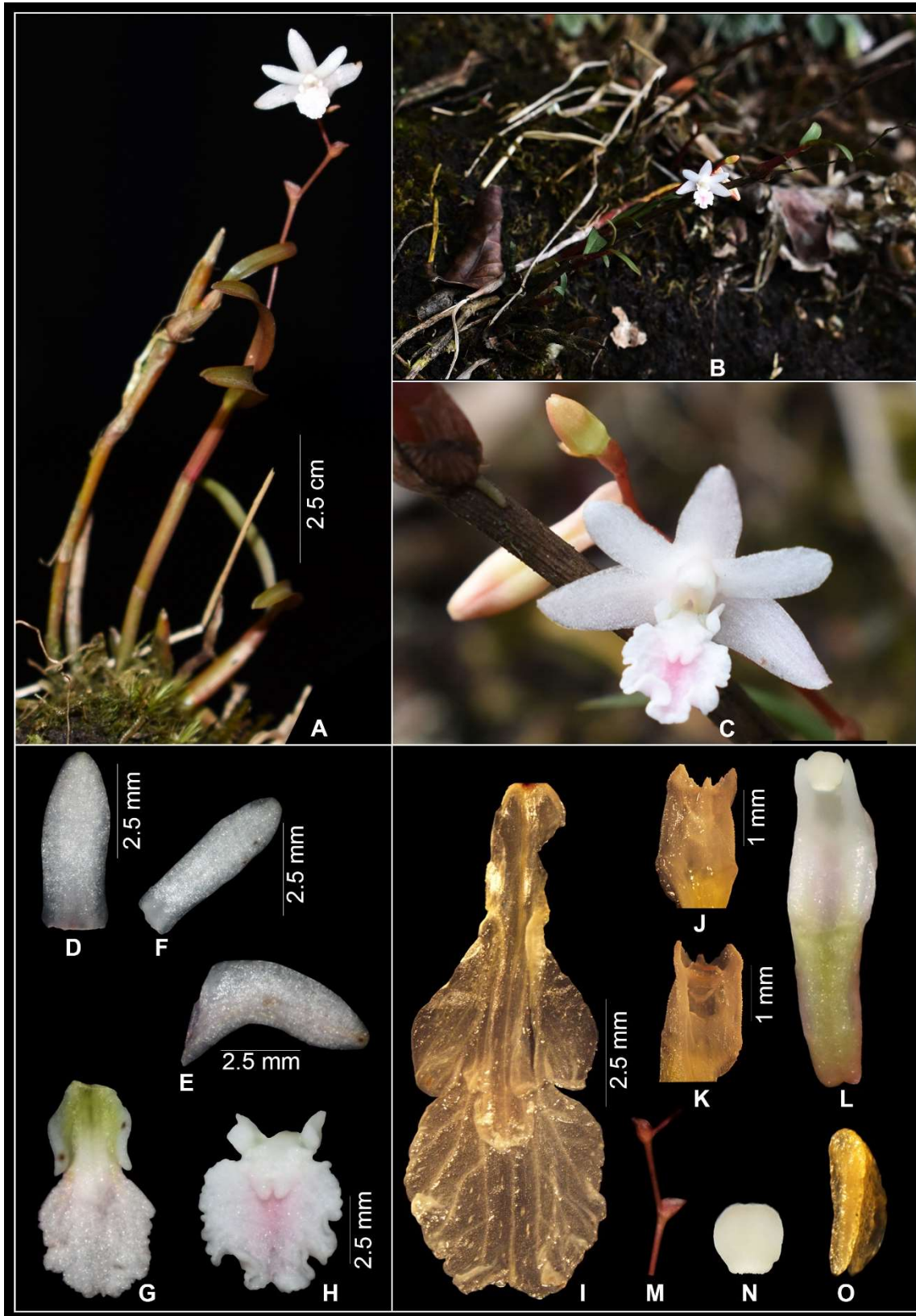


Fig. 1. *Dendrobium gopalanii* M.Sulaiman & Murugan sp. nov. A. Habit; B. Natural Habitat; C. Flower; D. Dorsal sepal; E. Lateral sepal; F. Petal; G. Lip (ventral view); H. Lip (dorsal view); I. Lip (spread out); J. Column (dorsal view); K. Stigma; L. Column with mentum; M. Peduncle with bract; N. Anther; O. Pollinia.



**Fig. 2.** The morphological differences of flower. **A.** *Dendrobium gopalanii* M.Sulaiman & Murugan; **B.** *D. heyneanum*; **C.** *D. panduratum* subsp. *panduratum*; **D.** *D. panduratum* subsp. *villosum*; **E.** *D. wightii*.

**Table 1.** Comparison of *Dendrobium gopalanii* sp. nov. and similar with species of *D. heyneanum*, *D. panduratum*, *D. panduratum* subsp. *villosum* and *D. wightii*.

Characters	<i>Dendrobium gopalanii</i>	<i>D. heyneanum</i>	<i>D. panduratum</i>	<i>D. panduratum</i> ssp. <i>villosum</i>	<i>D. wightii</i>
Habit	Lithophytes	Epiphytes	Epiphytes	Epiphytes or Lithophytes	Lithophytes
Stem	Cylindrical	Flattened	Flattened	Flattened	Flattened
Leaves	Leathery, obliquely acute	Chartaceous, acute	Chartaceous, acute	Chartaceous, acute	Chartaceous, acute
Inflorescence	Terminal, 2–4 cm long	Axillary, 4–7 cm long	Axillary, 4–6 cm long	Axillary or Terminal, 7–8 cm long	Terminal, 6–7 cm long
Flowers	White, c ca. 4 cm across	Whitish pink, ca. 8 cm across	White with purple tinges, ca. 8 cm across	Whitish pale pink, ca. 7 cm across	Whitish pink, ca. 8 cm across
Dorsal sepal	4–4.5 × 1.7–1.9 mm, oblong, 3-veined, obtuse	8–10 × 2–2.5 mm, ovate-lanceolate, 3-veined, acute	5.4–5.8 × 2.2–2.4 mm, oblong-lanceolate, 5-veined, acute	7–8 × 2.5–3 mm, elliptic, 5-veined, obtuse, mucronate	9–12 × 3–3.5 mm, oblong-lanceolate, 3-veined, acute
Lateral sepals	5–5.2 × 1.3–1.5 mm, falcate, oblong-lanceolate, 3-veined, acute	8–10 × 3–5 mm, ovate-lanceolate, 3-veined, acute	8.2–8.5 × 3–3.4 mm, oblong-lanceolate, 5-veined, acute	9–10 × 2.5–3 mm, falcately ovate-lanceolate, 5-veined, obtuse mucronate	8–10 × 1.8–2 mm, long, ovate-lanceolate, 3-veined, acute
Petals	5–5.2 × 1.3–1.5 mm, elliptic, obtuse	ca. 6 × 2 mm, elliptic, acute	ca. 6 × 1.5 mm, lanceolate, acute	ca. 7 × 2 mm, oblanceolate, acute	7–9 × 2–2.5 mm, oblong-lanceolate, acute
Lip	Orbicular, glabrous, retuse and mucronate in middle	Panduriform, pubescent, ovate, acute	Panduriform, puberulous, round, acute	Panduriform, villous, acute	Ovate, glabrous, acute
Callus	bi-lobed, ovate, obtuse	unlobed, truncate, acute	unlobed, truncate, acute	unlobed, truncate, acute	unlobed, oblong, acute

falcate, oblique, 5–6 × 1.8–2.2 mm, apex obtuse, 3-veined. Petals elliptic, 5–5.2 × 1.3–1.5 mm, 3-veined, minutely crenulate margin, apex obtuse. Lip 3-lobed, 7–8 × 3–3.3 mm, gland dotted, 3-veined in middle, 4–5 branching veins arising from middle veins; lateral lobes glabrous, ovate, 3.5–3.9 × 1–1.3 mm, incurved, much shorter than midlobe; midlobe orbicular, 4.5–5 × 4–4.5 mm, margin undulate, apex emarginate; disc fleshy, glabrous, callus ovate, extending 1.5–1.7 mm long, apex bi-lobed, lobules obtuse; mentum short, 2–3 mm long, straight, bi-lobed apex. Column ca. 2 × 1 mm; stelidia triangular, minutely crenulate at margin. Anther helmet-shaped, 2-celled; pollinia 4 in 2 pairs, minute, oblanceolate, waxy, yellow. Stigma orbicular, ca 1 mm long. Pedicel with ovary 7–8 mm long.

**Habitat and Phenology:** The lithophytic orchid mostly grows along the moist dripping rocks of mixed evergreen

forests of Agasthyarkoodam, Thiruvananthapuram at about 1,601 meter elevation. Flowering in February – March.

**Distribution:** The species has so far only been found at its type locality (**Fig. 3**).

**Etymology:** The specific epithet is named after Dr. R. Gopalan, Scientist-C (Rtd.), Botanical Survey of India, Coimbatore, for his noteworthy contribution to Indian Botany, in particular the Flora of Agasthyamalai.

**Preliminary Conservation status:** *Dendrobium gopalanii* M.Sulaiman & Murugan sp. nov., is ca. 100 individuals were located in a 5 km<sup>2</sup> area of the biosphere reserve. Further explorations in the adjacent hill tracts are necessary to ascertain its status, hence assessed as 'Data Deficient' (IUCN, 2014). There is no immediate threat to the species as the area falls under the Protected Areas of Agasthyamala Biosphere Reserve.



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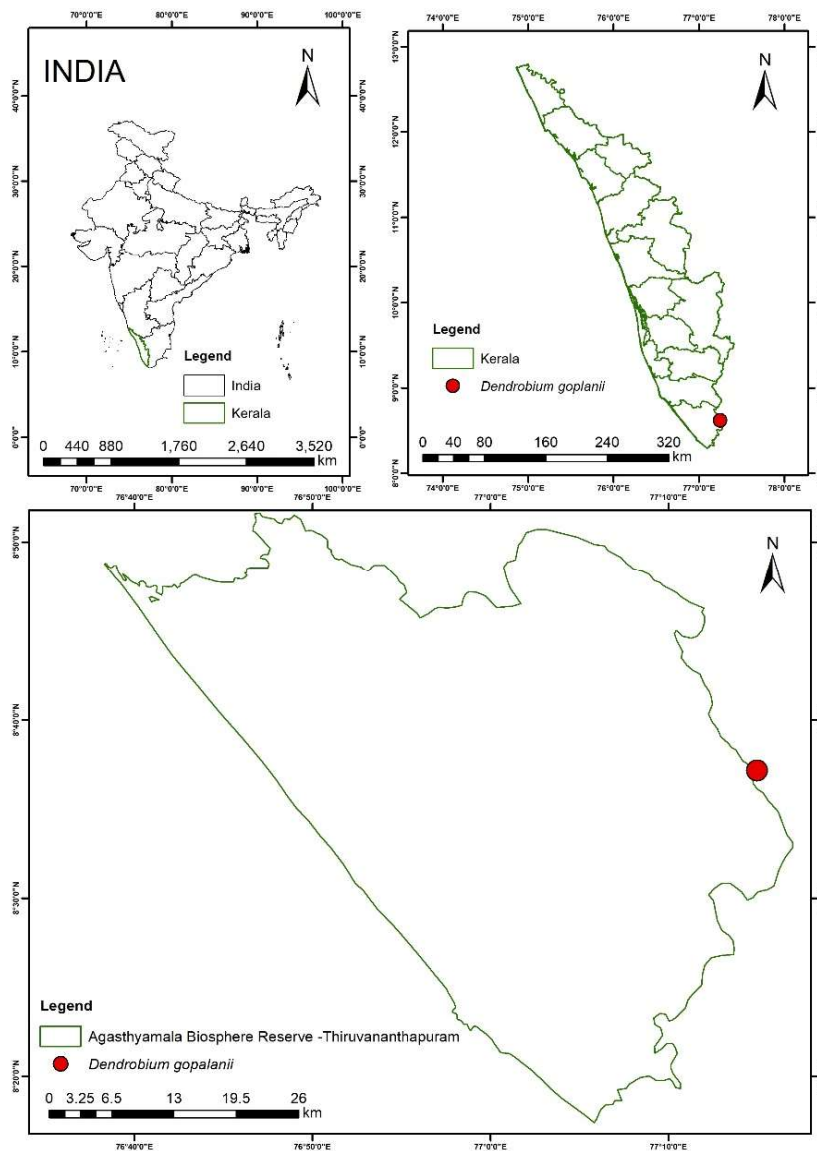


Fig. 3. Distribution of *Dendrobium gopalanii* M.Sulaiman & Murugan in type locality.