ANNEXURE 9. LIST OF PUBLICATIONS

a. Journal papers


**b. Conference papers**


Dendrobium georgei (Orchidaceae): A new species from southern Western Ghats, India

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Abstract

Dendrobium georgei (Orchidaceae) is described as a new species from southern Western Ghats, India.

Introduction

Dendrobium Swartz (1799, p. 82) is one of the largest genera of orchids, comprising between 1,100 and 1,450 species of epiphytic, occasionally lithophytic and terrestrial herbs, depending on how it is circumscribed (Cribb and Govaerts 2005; Schuiteman 2014). The genus includes numerous species with beautiful flowers, occupying diverse habitats throughout much of south, east and south-east Asia and Australasia, including the Philippines, Borneo, Australia, New Guinea and New Zealand. According to Misra (2007) the genus is represented by 116 Indian species.

Dendrobium is characterised by a combination of features such as the floral lip and lateral sepals, presence of a mentum (chin-like structure at the base of the column), and the absence of caudicles in their hard, waxy pollinia. In India, evergreen forests and montane grasslands of the southern Western Ghats form a potential centre of diversity for Dendrobium with 20 taxa reported from the Kerala part of the Western Ghats (Sasidharan 2013). Among these, 14 are endemic, while one species is categorized as critically endangered (IUCN 2012). Recent floristic exploration in the evergreen forests of Achankovil has yielded some interesting additional specimens of Dendrobium. The evaluation of specimens in various herbaria revealed that some accessions do not belong to any described species. This has resulted in the recognition of a novel species, which is described here as Dendrobium georgei Mathew.

Taxonomic treatment

Dendrobium georgei Mathew, sp. nov.

Diagnosis: Similar to Dendrobium herbaceum Lindl., differing in stem apically thickened into pseudo bulb, branching pattern, very limited number of branches (4), short internodes, leaf size thinner and shorter (6 cm vs 1.2 cm), flower larger and white.

Epiphytic herbs; roots smooth; stems clavoid, 150–300 mm long, tufted, cane-like, 3–6 mm wide at base, 10–14 mm wide towards tip; internodes 7–15 mm long in main stem and 3–7 mm in branchlets. Leaves alternate on terminal branches or branchlets only, 30–60 mm long, 0.1–0.12 mm wide, usually short-lived, with or without a tubular sheath at base, narrowly linear-lanceolate, acute, leafless when flowering. Flowers white, in 4–6-flowered racemes, formed on the subapical nodes of a pseudobulb, c. 16 mm across; pedicel up to 10 mm long, dorsal sepal 7 mm long, 2 mm wide, 3-veined, oblong-lanceolate and acute; lateral sepals 5 mm long, 2 mm wide 3-veined, oblong, subacute, apiculate; petals 5 mm long, 1.5 mm wide, 1-veined subfalcately oblong, obtuse, apiculate; labellum 5 mm long, 3 mm wide; side lobes ovate-orbicular; mid-lobe thick, orbicular, obtuse, tinged with yellow, with margin erose; mentum 8–12 mm long, incurved, anterior surface of the column base hollowed and broadened around stigma; rostellum bifid; pollinia 0.2–0.3 mm long, pale yellow, obliquely ovoid. Capsules 12–15 mm long, 6–7 mm wide (Fig. 1).
**Dendrobium georgei** (Orchidaceae) Telopea 16: 89–92, 2014

**Distribution and Ecology:** Found in montane grassland (alt. ± 1250 m) of the Kottavasal Hills, Agasthyamalai Biosphere Reserve, Western Ghats, Kerala, India. Grows on the trunks of *Schefflera wallichiana* (Wight & Arn.) Harms (Harms 1894–1897, p. 38), in association with bryophytes.

**Phenology:** Flowering and fruiting recorded from October to February.

**Conservation status:** The current conservation status is data deficient; however the distribution is limited with only a few plants observed at the few known locations (each with c. 60 plants – e.g. George 2929, 2933). Although this species occurs in the Agasthyamalai Biosphere Reserve, it appears to have a very restricted distribution and so should, at least, be considered vulnerable.

**Etymology:** The specific epithet honours Dr. K.V. George, Associate Professor of Botany, CMS College, Kottayam, and recognizes his immense contributions to botany, especially in the fields of angiosperm biodiversity and taxonomy.

**Notes:** *Dendrobium georgei* is fairly similar to *D. herbaceum* in both vegetative and floral morphology, but differs mainly in having stems apically thickened into a pseudobulb that is deeply furrowed, stems of 15–30 cm in length, 2–4 branches with very short internodes, thin and smaller leaf size (6 cm × 1.2 cm). In *D. georgei* inflorescences develop on nodes of the pseudobulb, and flowers are white, relatively large and showy. Specimens collected by Wood (2006) under his *Dendrobium* section *Herbacea*, fit the description of this new species.

**Additional specimen examined:** INDIA. Kerala: Kollam District, Kanayar, 9°11′08″N, 77°13′04″E, alt. ± 1200 m, Jose Mathew and K.V. George CMS2789, 28 November 2011 (flowering)(CMS).

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**Table 1. Prominent morphological differences between *D. georgei* with its allied taxa**

<table>
<thead>
<tr>
<th>Character</th>
<th><em>D. georgei</em></th>
<th><em>D. herbaceum</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit</td>
<td>straight to slightly curved 2–4 branches per stem</td>
<td>multiple up-curving branches, 15–20 branches right angles to each stem.</td>
</tr>
<tr>
<td>Stem</td>
<td>narrow at base (3–6 mm), swollen towards tip (10–14 mm), 150–300 mm in length</td>
<td>linear to fusiform, up to 1000 mm in length</td>
</tr>
<tr>
<td>Leaf</td>
<td>thin, narrowly linear-lanceolate, acute, up to 60 mm long, 120 mm wide</td>
<td>thick, narrowly linear-lanceolate, acute or subobtuse, up to 120 mm long and 150 mm broad</td>
</tr>
<tr>
<td>Pseudobulb</td>
<td>apically thickened pseudo bulb present</td>
<td>apically thickened pseudo bulb absent</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>formed on the nodes of pseudobulb</td>
<td>formed on the terminal or lateral nodes of the stem</td>
</tr>
<tr>
<td>Floral parts</td>
<td>white</td>
<td>yellow</td>
</tr>
<tr>
<td>pedicel up to 10 mm</td>
<td>pedicel 6–7 mm long</td>
<td></td>
</tr>
<tr>
<td>dorsal sepal 7 × 2 mm</td>
<td>dorsal sepal 5 × 1.5 mm</td>
<td></td>
</tr>
<tr>
<td>lateral sepals 5 × 2 mm</td>
<td>lateral sepals 4 × 1.5–2 mm</td>
<td></td>
</tr>
<tr>
<td>lateral petals 5 × 1.5 mm</td>
<td>lateral petals 4 × 1 mm</td>
<td></td>
</tr>
<tr>
<td>labellum 5 × 3 mm</td>
<td>labellum 3 × 2 mm</td>
<td></td>
</tr>
</tbody>
</table>

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**Acknowledgments**

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Misra S (2007) Orchids of India, a glimpse. (Bishen Singh Mahendra Pal Singh, Dehradun)

Sasidharan N. (2013) Flowering plants of Kerala: CD-ROM ver. 2.0. (Kerala Forest Research Institute, Peechi, Kerala)


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Dendrobium kallarensis (Orchidaceae): A new species from southern Western Ghats, India

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Introduction

Dendrobium Swartz (1799: 82) is one of the largest epiphytic, occasionally lithophytic and terrestrial herbs by Cribb & Govaerts (2005), genera of beautiful flowers comprising of about 1,100 species. The genus occurs in diverse habitats throughout much of south, east and south-east Asia, including Philippines, Borneo, Australia, New Guinea and New Zealand. In India the genus is represented by 116 species by Misra (2007). The characteristic feature of Dendrobium is presence of mentum, a chin made up from the column foot, lip and lateral sepals and the absence of caudicle in the pollinia. The evergreen forests and the montane grass lands of southern Western Ghats is a potential centre of Dendrobium in India. Altogether 20 taxa of Dendrobium were reported from the Kerala part of Western Ghats by Sasidharan (2013). Among the 20 taxa, 14 are distinguished as endemic and one species under critically endangered category by IUCN (2012).

Recent floristic exploration in the evergreen forests of Achankovil yielded some additional specimens of Dendrobium. Critical study with the literature and authentic specimens in various Herbaria revealed that our specimens do not agree with the described species. These studies resulted in the finding of a new species, which is described here as Dendrobium kallarensis.

Materials & Methods

Dendrobium kallarensis Jose, George, Yohannan& Madhusudhanan, sp.nov., Figs.1& 2

Type:—INDIA. Kerala: Pathinamthitta District, Kallar, 9° 13’ 11” N, 77° 9’ 14” E, 1200 M, November 26th 2011, Jose Mathew & K.V.George CMS 02748 (Flowering twig) (Holotype: MH; Isotypes: Herbarium of the CMS college- Kottayam, School of Environmental Sciences- Mahatma Gandhi University- Kottayam- Kerala)

Lithophyte on wet rocks. Pseudobulb ovoid, swollen, compressed, brown, 2-4 cm. Leaves 2-3, size to 7 x 0.5 cm, linear, acute, membranous, leafless when flowering. Flowers 1-3, usually 1/ one at a time, bluish pink, in 4-5 cm long slender terminal racemes; pedicels 7 mm long. dorsal sepal 14 x 5 mm, lanceolate, obtuse, 5-veined; lateral
sepals 14 x 9 mm, ovate-lanceolate, acute, 5-veined; petals 15 x 10 mm, obovate, obtuse, 7-veined; lip 15 x 12 mm, 3-lobed, side lobes ovate, obtuse, 6 x 4 mm, midlobe 9 x 8.5 mm, obovate, truncate at apex, disc with an oblong callus and yellow hairs. Capsule fusiform.

**FIGURE 1.** : *Dendrobium kallarensis* A. Habit. B. Flowering twig C&D. Regeneration on rainy season. E& F. With Mature leaves

**Distribution & Ecology:** —The new taxa grows in moist rocks in the montane grassland ± 1000 m, associated with *Didymocarpus humboldtiana* Gard. (1846: 477).

Table 1. Prominent morphological differences between *Dendrobium kallarensis* with its allied species

<table>
<thead>
<tr>
<th>Character</th>
<th><em>D. kallarensis</em></th>
<th><em>D. barbatulum</em></th>
<th><em>D. wightii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit</td>
<td>Lithophyte</td>
<td>Epiphyte</td>
<td>Lithophyte</td>
</tr>
<tr>
<td>Stem</td>
<td>True stem absent</td>
<td>Distinct Stem 5-10 cm long</td>
<td>15-20 cm</td>
</tr>
<tr>
<td>Pseudobulb</td>
<td>Ovoid, 2-4 cm long</td>
<td>Very minute bulb</td>
<td>Bulb absent</td>
</tr>
<tr>
<td>Leaves</td>
<td>2-3, Size up to 7x 0.5 cm, absent when flowering</td>
<td>Few, 10x 0.7cm, absent when flowering</td>
<td>Few, 6.7 x 0.5 cm, present when flowering</td>
</tr>
<tr>
<td>Flower</td>
<td>1-3 at a time 1</td>
<td>5-9 flowered racemes</td>
<td>3-5 in racemes</td>
</tr>
<tr>
<td>Floral parts</td>
<td>Sepals 5 veined, 14 x 5 (dorsal) &amp; 9 (lateral) mm. Petals 7 veined, 15 x 10 mm lip 15 x 12 mm</td>
<td>Sepals 5 veined 12.5 x 4.5 (dorsal) &amp; 8 (lateral) mm. Petals 7 veined, 13.5 x 9 mm lip 13 x 11 mm</td>
<td>Sepals 3 veined, 10 x 2.5 (dorsal) &amp; 3 (lateral) mm. Petals 3 veined, 8 x 2 mm lip 11 x 3-6 mm</td>
</tr>
</tbody>
</table>
Eponymy: — The specific epithet named for the location in which first collected, and perhaps confined.

Phenology: — Flowering & fruiting occur during October-February.

Conservation status: — The new taxa is seen in undisturbed wet rock strewn pockets of montane grass lands in Kallar valley and Pulikkayam of Achankovil belongs to Agasthyamala Biosphere Reserve. A total of 300 individuals were scattered on this environs.

Additional specimen examined: — INDIA. Kerala: Kollam District, Kanayar, 9° 11’ 06” N, 77° 13’ 04” E, +1200 M, November 29th 2011, Jose Mathew & K.V.George CMS 02787 (Flowering).

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REFERENCES


