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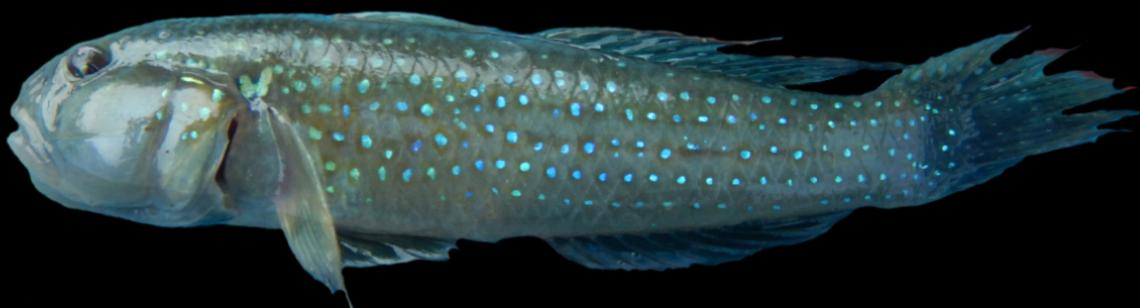
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Cover: Fish species recorded in the Gowthami-Godavari Estuary, Andhra Pradesh: *Lutjanus johnii* (top left), *Triacanthus biaculeatus* (top right), *Acentrogobius cyanomos*, *Elops machnata*, *Trypauchen vagina*, *Oxyurichthys microlepis*. © Paromita Ray.



Range extension of lesser-known orchids to the Nilgiris of Tamil Nadu, India

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Abstract: The present paper records the extended distribution of orchids, viz., *Oberonia chandrasekharanii* V.J.Nair, V.S.Ramach. & R.Anbari, *Peristylus plantagineus* (Lindl.) Lindl., *Porpax exilis* (Hook.f.) Schuit., Y.P.Ng & H.A.Pedersen, and *P. jerdoniana* (Wight) Rolfe, to the Nilgiris of Tamil Nadu.

Keywords: Endemics, epiphytes, new record, Orchidaceae, *Porpax*, Western Ghats.

Orchids, one of the highly evolved or advanced flowering groups in the Plant Kingdom are known for their shape, structure, colour and everlasting flowers. The diversity of orchids is extensive; they are distributed all the way from tropics to alpine meadows with varied habits for their survival like epiphytes, lithophytes, saprophytes, and terrestrials. "The Orchids of India" accounts with 1,256 taxa belonging to 155 genera with 307 endemic species; while the Western Ghats is represented by 305 species under 75 genera among which 128 species are endemic to the region; whereas from Tamil Nadu state, 215 species under 62 genera are documented of which 92 species are endemic (Singh et al. 2019). From the Nilgiris district of Tamil Nadu 113 species were reported by Sharma et al. (1977), later Joseph (1982) documented 116 species under 49 genera.

Recently, Jeevith et al. (2019) recorded 37 species belonging to 23 genera from the shola and grasslands of the Nilgiris.

Naturally, plants distribute or migrate through seed dispersal by various kinds of agents, viz., wind, water, insects, birds, and animals. Sometimes, their dispersion is enhanced through environmental disasters like cyclone, flood, torrential rain, causing translocation to an extended distance or range extension. Thus, previously distributed floral elements grow with the new associations. The regional flora workers should significantly document the new invasion of native or exotic species. It facilitates to compare the floristic assessment of an area on different time periods.

Although the flora handbook and pictorial guide of the Nilgiris is available, its flora is being continuously updated by new distribution records (Kiruthika et al. 2018; Kaliamoorthy & Saravanan 2019). The present paper highlights the range extension of four lesser-known orchids from the Nilgiris district of Tamil Nadu. Each species is supplemented with description, photographs, and other relevant details for easy identification (Image 1).

Editor: Anonymity requested.

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MATERIALS AND METHODS

Study area

The Nilgiris district of Tamil Nadu is geo-positioned between 11.2–11.61°N latitude and 76.5–76.91°E longitude and ranging in altitude between 300 to 2,637 m. It lies phytogeographically in the Western Ghats covering total forest cover with 1,731.01 km² of which 466.72 km², 629.85 km², and 634.44 km² area with dense forest, moderate dense forest, and open forest respectively (India State Forest Report 2019). The hilly district is surrounded by Karnataka in the north, Kerala in the west, Coimbatore in the south, and Erode in the east.

Methods

After studying the indigenous medicinal plants in the Nilgiris district of Tamil Nadu (2016–2018), the authors collected a few species of orchids. The survey was supported with recording the field data, geo position and photograph of the species. The orchids were identified and studied using national and regional flora (Ansari & Balakrishnan 1990; Kumar & Manilal 1994; Fischer 1928, 2004; Misra 2007; Singh et al. 2019) and specimen examined in CAL, FRC, MH, and virtual herbarium of K. The voucher specimens are deposited at PSGR Krishnammal College for Women, Coimbatore, Tamil Nadu.

TAXONOMIC TREATMENT

1. *Oberonia chandrasekharanii* V.J.Nair, V.S.Ramach. & R.Anasari, Blumea 28: 361. 1983; C.S. Kumar & Manilal, Cat. Indian Orch. 81. 1994; S. Misra, Orchids India 309. 2007; S.K. Singh et al., Orchids of India - A pictorial guide 382. 2019; Ganesan et al. Endemic Flora of Western Ghats – Anamalais 1: 182. 2019. (Image 2).

Epiphytes up to 38 cm long. Acaulescent. Leaves ca. 15.0 x 1.5 cm, articulate at base, ensiform, acute. Scape ca. 9.0 x 0.6 cm, flattened. Inflorescence raceme, ca. 22 cm long, verticils. Flowers ca. 2 x 1 mm, pale brownish, pedicelled. Bracts ca. 2.0 x 1.25 mm ovate or lanceolate, acuminate, irregularly denticulate along margins, gland-dotted. Sepals & petals reflexed, sparsely gland-dotted; dorsal sepal ca. 1.25 x 1.0 mm, ovate-oblong, obtuse, entire; lateral sepals ca. 1.25 x 1.0 mm, ovate-oblong, obtuse, induplicate. Petals ca. 1.25 x 0.5 mm, linear, denticulate, distantly denticulate along margins. Lip antrorse, ca. 1.5 x 2.0 mm, semi-orbicular or reniform in outline, papillose, gland-dotted, 3-lobed; lateral lobes cuneate and auriform, folded upwards round the column by the proximal end; midlobe ca. 0.5 x 0.75 mm, 2-lobuled with a broad sinus in between; lobules

orbicular; disc ovate, concave and sac-like. Pedicel with ovary ca. 2 mm long. Column ca. 0.39 x 0.45 mm, cylindric; clinandrium apical, orbicular, winged around; operculum sub-orbicular, rounded; rostellum retuse, shorter than the clinandrial wings; stigma sub-orbicular, saccate. Pollinia ca. 0.3 x 0.18 mm, obovoid.

Flowering & Fruiting: July–October.

Habitat: The species is distributed in the Wilson Plantation of Eucalyptus sp.

Specimen examined: 81B (PSGR Krishnammal College for Women), 15.vii.2017, India, Tamil Nadu, Nilgiris district, Wilson Plantation – Naduvattam, 11.491339°N & 76.525112°E, 1,515 m, coll. K. Kiruthika & M. Sulaiman.

Distribution: India (Karnataka, Kerala & Tamil Nadu).

Note: *Oberonia chandrasekharanii* can be easily identified from other *Oberonia* species by papilose nature of lip. Recently, the species has been reported from the Anamalai hills of Tamil Nadu (Ganesan et al. 2019). More than 20 individuals of the species observed in Wilson Plantation, Naduvattam.

2. *Peristylus plantagineus* (Lindl.) Lindl., Gen. Sp. Orchid. Pl. 300. 1835; C.E.C. Fisch. in Gamble, Fl. Madras 3(8): 1475. 1928; J.Joseph & R.Anasari in A.N.Henry et al., Fl. Tamil Nadu, Ind. Ser. I: Analy. 3: 22. 1989; C.S. Kumar & Manilal, Cat. Indian Orch. 83. 1994; C.E.C. Fisch., Flora of the Anamalai Hills 2nd reprint 176. 2004; S. Misra, Orchids India 312. 2007; S.K. Singh et al., Orchids of India - A pictorial guide 421. 2019. *Herminium plantagineum* Lindl., Edwards's Bot. Reg. 18: t. 1499. 1832. *Habenaria wightii* Trimen, Syst. Cat. Fl. Pl. Ceylon: 91. 1885; Hook.f., Fl. Brit. India 6: 162. 1890. (Image 3).

Terrestrial up to 90 cm tall. Tuber 2, 2–3 cm long, oblong or ellipsoidal, terete. Stem 25–30 x 1.5–4.0 mm, erect, terete, glabrous, sheaths broad, tubular, acuminate. Leaves 3–8, 6–15 x 2–5 cm, clustered about middle of stem, closely sheathing at the base, sessile, broadly elliptic to elliptic-ovate, acute, entire, minutely papillose, mid-nerve prominent, 5–7-veined. Inflorescence a raceme, terminal spike, 9–22 cm long, erect, densely many flowered; peduncle 4–10 cm long, bracteate; stem bracts 1.5–2.0 x 0.4–0.6 cm, ovate-lanceolate, acuminate, entire, papillose, glabrous, dirty brownish-green with a yellow margin. Flowers greenish-white, 5–7 mm long, sessile, resupinate. Bracts 9–14 x 2–3 mm, pale brownish-green, lanceolate, longer than the pedicel and ovary, lanceolate, acuminate, 1-nerved. Sepals sub-smilar, very minutely denticulate, glabrous, strongly 1-nerved; dorsal sepals 2.0–4.5 x 2.0–3.0 mm, concave, oblong-ovate, obtuse, forming a hood with petals; lateral sepals 2.5–5.0 x 1.5–2.5 mm, spreading,

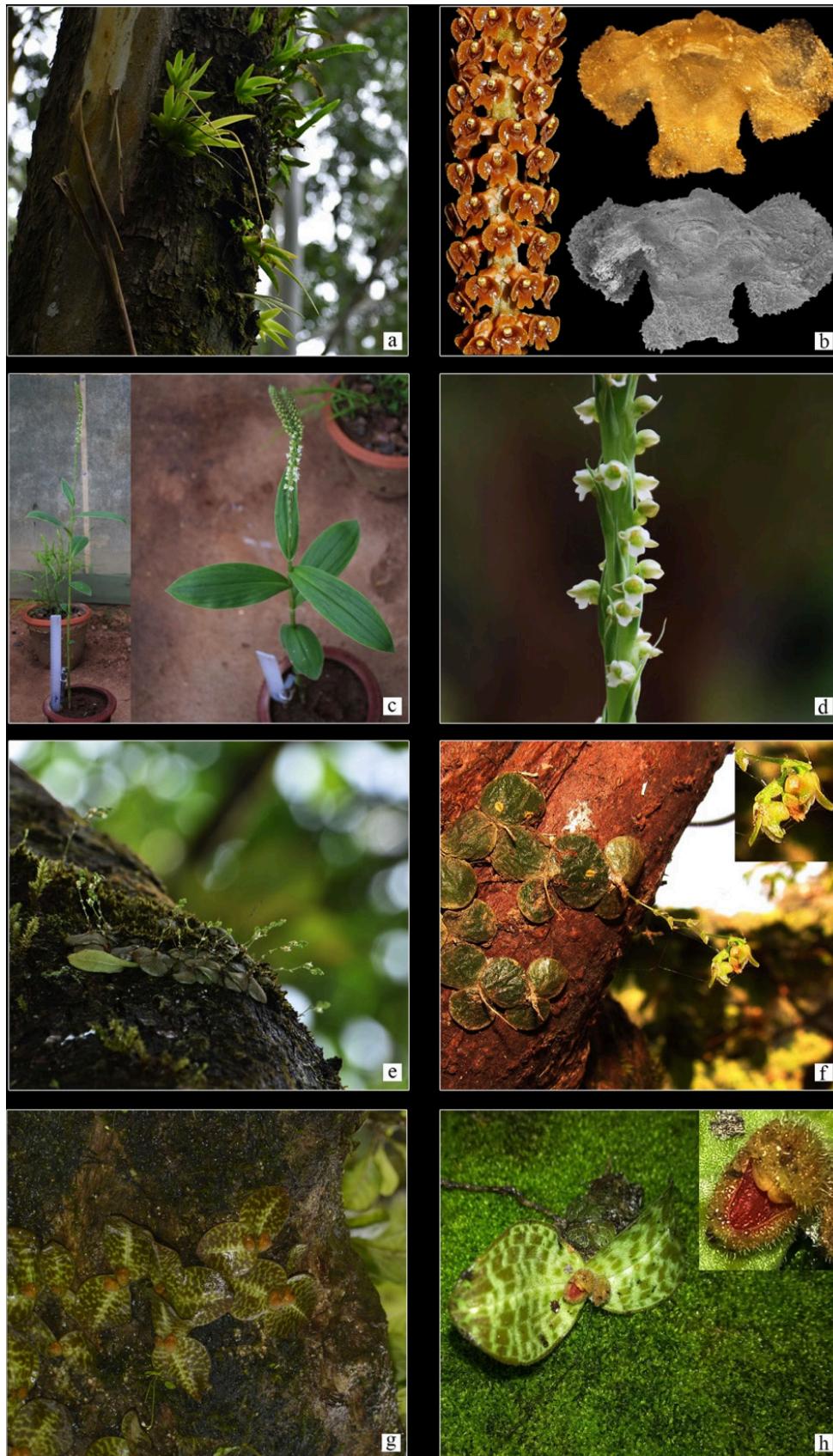


Image 1. a,b—*Oberonia chandrasekharanii* (Habit & Inflorescence along with labellum of the flower) | c,d—*Peristylus plantagineus* (Habit & Inflorescence) | e,f—*Porpax exilis* (Habit & Flowers close view) | g,h—*P. jerdoniana* (Habit & flower close view). © M. Sulaiman.



Image 2. *Oberonia chandrasekharanii* herbarium sheet preserved at PSGRKCW.



Image 3. *Peristylus plantagineus* herbarium sheet preserved at PSGRKCW.

oblong, margins incurved, often overlapping, sub-oblong, apex at acute. Petals 2.5–4.0 x 2.0–3.0 mm long, obliquely oblong-elliptic, obtuse, entire, glabrous, glands dotted, 1-nerved. Lip 2.0–3.5 x 2.0–3.5 mm, smaller than the lateral sepals, faintly white, gland-dotted, broadly ovate, oblong, obtuse, shortly 3-lobed, base of the lip sub-concave, 3-nerved, mid nerve running straight from the base to the apex, the two lateral ones slightly sinuate, meeting below the apex at to form a loop across the mid-nerve; spur much shorter than sepals. Column short, pale green. Anther rounded, short recurved; tubes, divergent at the base; pollinia 2, clavate, caudicles very small with a small orbicular gland. Stigmatic lobes short, stout convex. Pedicel with ovary ca. 10 x 2 mm, stout, curved at apex, ribbed.

Flowering & Fruiting: July–December.

Habitat: Tropical evergreen forests and grasslands.

Specimen examined: 39A (PSGR Krishnammal College for Women), 28.viii.2016, India, Tamil Nadu, Nilgiris district, Allurkoodamoola – Gudalur, 11.51723°N & 76.519669°E, 964 m, coll. K. Kiruthika & M. Sulaiman.

Distribution: India (Chhattisgarh, Odisha, West Bengal, Madhya Pradesh, Andhra Pradesh, Gujarat,

Maharashtra, Goa, Karnataka, Kerala, & Tamil Nadu), Nepal, and Sri Lanka.

Note: *Peristylus plantagineus* can be easily recognised by having obscurely lobed lip and long floral bracts which exceed to the pedicel and ovary. It is found growing under moist Bamboo forests in Allurkoodamoola, Gudalur and previously recorded only from Anamalai and Tirunelveli hills of Tamil Nadu.

3. *Porpax exilis* (Hook.f.) Schuit., Y.P.Ng & H.A.Pedersen, Bot. J. Linn. Soc. 186: 199. 2018. *Eria exilis* Hook.f., Hooker's Icon. Pl. 19: t. 2074. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3(8): 1425. 1928; C.S. Kumar & Manilal, Cat. Indian Orch. 73. 1994; S. Misra, Orchids India 297. 2007; Karuppusamy & Ravichandran, Biosci. Disc. 4(1):12. 2013; S.K. Singh et al., Orchids of India - A pictorial guide 261. 2019. *Porpax chandrasekharanii* Bhargavan & C.N. Mohanan, Curr. Sci. 51: 990. 1982. *Eria chandrasekharanii* (Bhargavan & C.N. Mohanan) C.S.Kumar & Manilal, Taxon 35: 720. 1986. (Image 4).

Epiphytic, up to 3 cm tall. Pseudobulbs 0.3–1.0 cm across, 0.1–0.2 cm thick, button like, dorsi-ventrally compressed pushing the apex at to a lateral position,

always in pair or triplet, with white epidermal venation; scape 1.5–2.8 cm long, arise from the side of matured pseudobulbs. Leaves 2, 1.0–2.5 x 0.4–0.9 cm, deciduous, from the top of the scape, sub-opposite, unequal, obovate-elliptic to oblanceolate-oblong, entire, minutely serrulate towards apex, acuminate-apiculate, 7–9-veined, base sheathing, channeled, articulate, leaves fall before flowering. Inflorescence a raceme, 1.5–2.5 cm long, laxly 5–16-flowered, glabrous; peduncles slender, erect, terete, base at covered by the sheathing leaf-bases and sheath; rachis 1.0–1.3 cm long, slender, strongly flexuous. Flowers minute, 2.5–4.0 mm long, not fully opening, glabrous, white to greenish-yellow, lip purple. Bracts 1.0–1.5 x 1.0–1.5 mm, persistent, equal or shorter than pedicel and ovary, clasping, membranous, ovoid, cymbiform, entire, acuminate, 1-veined. Dorsal sepal ca. 2.0 x 1.2 mm, ovate-oblong, entire, obtuse, 1-veined; lateral sepals 2.0–2.2 x 1.5–2.0 mm, ovate, falcate, entire, sub-acute to obtuse, 1-veined; mentum ca. 1.0 x 1.5 mm, saccate, broadly orbicular, curved outwards. Petals 1.3–1.8 x 0.5–0.7 mm, elliptic-lanceolate, falcate, entire, acute, 1-veined. Lip 1.5–1.8 x 0.8–0.9 mm, enclosed within the lateral sepals and mentum, simple, fleshy, conduplicate,

strongly recurved at the middle, entire to slightly undulate, 3-veined, veins ending well behind the apex; disc with 2-oblong calli along the margins from base to apex. Column 0.3–0.5 mm long, erect; foot 1.2–1.5 mm long, elongated, curved; clinandrium widely 2-grooved; rostellum reflexed, tongue-shaped; stigmatic cavity orbicular. Anther ca. 0.3 x 0.4 mm, broadly orbicular, slightly emarginate, 2-lobed, each lobe 4-chambered; pollinia 8, in 4 unequal pairs, ca. 0.2 mm long, oblong-clavate, united by caudicles. Pedicel with ovary 1–1.15 mm long, slightly curved. Capsules 2.5–5.0 mm long, broadly ovate to obpyriform, ridged.

Flowering & Fruiting: January–May

Habitat: *Porpax exilis* is found in colonies on the host of *Litsea* sp.; it is associated with *Pinalia mysorensis* (Lindl.) Kuntze Lindl. and *Bulbophyllum* sp. in the tropical evergreen forests.

Specimen examined: 166 (PSGR Krishnammal College for Women), 16.i.2017, India, Tamil Nadu, Nilgiris district, Puliyanmbara – Gudalur, 11.503091°N & 76.416058°E, 975 m, coll. K. Kiruthika & M. Sulaiman.

Distribution: India (Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu).

4. *Porpax jerdoniana* (Wight) Rolfe, Orchid Rev. 16: 8. 1908; C.E.C. Fisch. in Gamble, Fl. Madras 3(8): 1422. 1928; J.Joseph & R.Anvari in A.N.Henry et al. Fl. Tamil Nadu, Ind. Ser. I: Analy. 3: 23. 1989; C.S. Kumar & Manilal, Cat. Indian Orch. 84. 1994; S. Misra, Orchids India 315. 2007; Uthayakumari Kalavathy, Taxonomic studies of the Monocots of Tirunelveli hills 71. 2004. S.K. Singh et al., Orchids of India - A pictorial guide 457. 2019. *Lichenora jerdoniana* Wight, Icon. Pl. Ind. Orient. 5: t. 1738. 1851. *Eria lichenora* Lindl., J. Proc. Linn. Soc., Bot. 3: 46. 1858; Hook.f., Fl. Brit. India 5: 787. 1890. (Image 5).

Epiphytes. Pseudobulb 0.5–1.0 cm diam., discoid, enclosed by reticulated sheath. Leaves 1.5–2.0 x 1.0–1.5 cm, 2-per pseudobulb, pale brown or green, orbicular or ovate, hairy on both surfaces, with reticulate veins and persistent during flowering. Flowers 1–2, reddish-brown, arise between leaves, sessile. Sepals connate, tube 2-lipped, lobes unequal, oblong, pubescent; dorsal sepal ca 1.5 x 1.0 mm; lateral sepals ca 2 x 1 mm, fused. Petals ca 2.0 x 0.7 mm, linear, fused, obtuse, 3-veined. Lip ovate-cordate, sides toothed, tip subulate, gland dotted. Anther 2-celled, ca. 1.5 x 1.0 mm, orbicular; pollinia 8, ca. 0.8 mm long clavate, waxy. Pedicel with ovary 3–4 cm long, densely hairy.

Flowering & Fruiting: July–October.

Habitat: The species is found growing on *Careya arborea* trees in association with *Dendrobium*



Image 4. *Porpax exilis* herbarium sheet preserved at PSGRKCW.

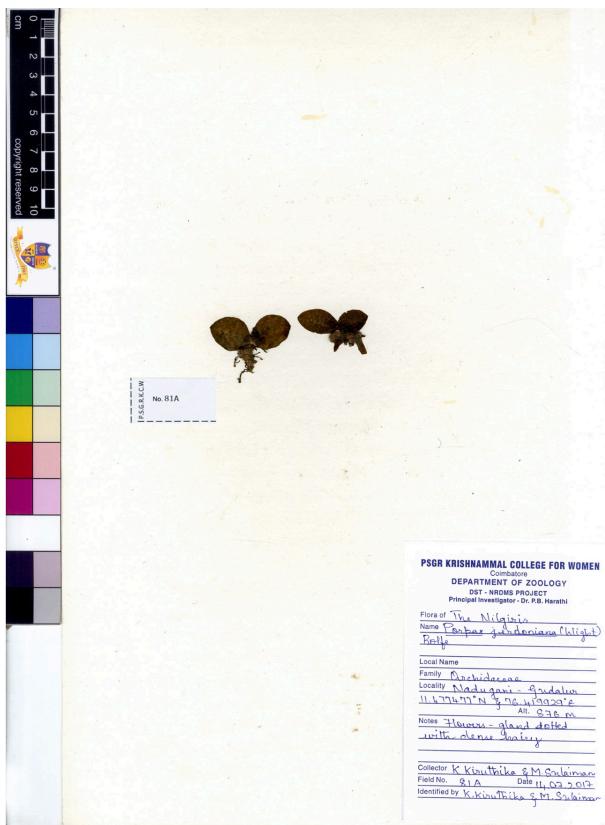


Image 5. *Porpax jerdoniana* herbarium sheet preserved at PSGRKCW.

macrostachyum in tropical evergreen forests.

Specimen examined: 81A (PSGR Krishnammal College for Women), 14.vii.2017, India, Tamil Nadu, Nilgiris district, Nadugani – Gudalur, 11.477477°N & 76.419929°E, 876 m, coll. K. Kiruthika & M. Sulaiman.

Distribution: India (Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andaman & Nicobar Islands).

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