

NORDIC JOURNAL OF BOTANY

Research Article

Ophiorrhiza jomyi (Rubiaceae) sp. nov. from the Vagamon Hills, southern Western Ghats, India

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Nordic Journal of Botany

2026: e05085

doi: 10.1002/njb.05085

Subject Editor: Ranee Prakash

Editor-in-Chief: Jalil Noroozi

Accepted 12 February 2026

Published 19 March 2026

A new species of *Ophiorrhiza* (Rubiaceae) is identified and described from the Vagamon hills of Kerala, Western Ghats, India. The new species is similar to *Ophiorrhiza eriantha* Wight and *Ophiorrhiza meenachilarensis* Robi and Balan, but differs in having densely hirsute hairs on young stem, petiole and peduncle; patent hirsute hairs on, above and beneath the leaf; 14.0–15.0 mm long flower; linear to falcate bracts and bracteoles; sparsely hirsute cupuliform hypanthium; triangular calyx lobes; 9.5–12.0 mm long corolla tube; stamens inserted at the middle of the corolla tube; and oblong and papillate stigma. A detailed description, colour photographs, comparison, phenology, distribution, conservation status and key to the allied taxa of the new species are provided.

Keywords: Kottayam, new species, *Ophiorrhiza jomyi*, Western Ghats



Introduction

The genus *Ophiorrhiza* is one among the largest genus in the family Rubiaceae with 384 species in the world, distributed primarily from tropical and subtropical Asia to the Pacific (POWO 2025). The members of the genus are predominantly herbaceous and belong to the tribe *Ophiorrhizeae* of the Rubiaceae family (Bremer and Manen 2000, Bremer and Eriksson 2009). Linnaeus (1747) originally described the genus in his work 'Flora Zeylanica'. According to Deb and Mondel (1997), the Indian sub-continent is home to 47 species and 9 varieties, with the northeastern states and the Western Ghats serving as the two main distribution centres. In India, 52 taxa have been recorded (Hareesh et al. 2017). The Western Ghats are home to 21 taxa and 7 varieties of this genus (Deb and Mondal 1997, Nayar et al. 2014, Hareesh et al. 2015, 2018, Balan et al. 2020, Nair et al. 2022, Nair 2023). Of these, 17 species and two varieties are endemic to the Western Ghats region (Nayar et al. 2014).



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The authors collected an interesting specimen of *Ophiorrhiza* during their botanical research in the Vagamon Hills, Kottayam district, Kerala. It shared morphological similarities with *Ophiorrhiza eriantha* Wight and *Ophiorrhiza meenachilarensis* Robi and Balan. After a thorough taxonomic examination, consultation with nomenclature types and protologues of the allied species and review of the literature (Wight 1846, Deb and Mondal 1997, Balan and Robi 2020, Nair 2023), the collected specimen was found to be a hitherto undescribed species, and it is described here as new to science.

Material and methods

Specimens of the new species were collected during March 2024–June 2025 from the Vagamon Hills, Kottayam District, Kerala. The morphological characters of the collected specimens were analysed and the descriptions were prepared based on the live collections and standard terminologies (Beentje 2016). Photographs of the specimens were taken using a Nikon D500 DSLR camera and the microphotographs were captured using a Celestron Digital Microscope. Voucher specimens were prepared based on Forman and Bridson (1991) and were deposited in MH, CALI, DSAH, FAH and STC. The conservation status of the new species was assessed using the standard IUCN Categories and Criteria (IUCN Standards and Petitions Committee 2024).

Taxonomic treatment

Ophiorrhiza jomyi Ebin, Sreehari & Joby sp. nov. (Fig. 1)

Diagnosis

This species shows close morphological resemblance with *O. eriantha* Wight, but differs in having densely ascending hirsute indumentum on stem (versus pubescent or glabrous stem), patent hirsute hairs on both sides of leaves (versus glabrous above, puberulous on the nerves beneath), densely hirsute petiole (versus glabrous or puberulous petiole), stipule acuminate to attenuate at apex (versus stipule bifid at apex), 14.0–15.0 mm long flower (versus 19.0–27.0 mm long flower), cupuliform hypanthium (versus obovoid hypanthium), triangular calyx lobes (versus subulate calyx lobes), densely puberulous hairs and with a villose ring at the middle of the corolla tube inside (versus glabrous inside without a ring of villose hairs), 2.5–3.0 mm long corolla lobes (versus 5.0–7.0 mm long corolla lobes), 1.75–2.0 mm long anthers (versus 3.0–3.5 mm long anthers), oblong stigma, obtuse at apex with papillate hairs (versus lanceolate stigma, acute at apex and glabrous), 0.4 × 0.5 mm, irregularly angled seeds (versus 0.6 × 0.5 mm, 4–6 angular seeds).

The species is also morphologically similar to *O. meenachilarensis* Robi and Balan, but varies in having leaves with patent hirsute hairs on both sides (versus sparsely appressed pilose above, densely so beneath especially along the veins),

linear-lanceolate to triangular stipule (versus ovate stipule), 3.0–5.5 cm long peduncle with densely hirsute hairs (versus 0.1–3.0 cm long peduncle with rusty villous hairs), 14.0–15.0 mm long flowers (versus 10.0–12.0 mm long flowers), bract and bracteole dissimilar (versus bract and bracteole similar), cupuliform hypanthium (versus obovoid hypanthium), triangular calyx lobes (versus lanceolate calyx lobes), stamen inserted at the middle of corolla tube (versus stamen inserted at the base of corolla tube), filaments 2.0–2.5 mm long (versus filaments 1.0–1.5 mm long), anthers 1.75–2.0 mm long (versus anthers 1.5–1.6 mm long), 4.0–4.5 mm long style (versus 6.0–8.0 mm long style), oblong and papillate stigma (versus ovate-orbicular and glabrous stigma).

Type: India, Kerala, Kottayam district, Vagamon hills, moist shady areas of an evergreen forest, 9°40'01"N, 76°53'48"E, 912 m. a.s.l., 21 May 2024, Ebin and Sreehari 2822 (holotype MH; isotype CALI, DSAH, FAH, STC).

Etymology

The specific epithet is in honour of retired Professor, Dr Jomy Augustine, Department of Botany, St Thomas College, Pala, Kottayam, Kerala, for his guidance and support in the field of taxonomy to the authors. Dr Jomy Augustine has significantly contributed to the documentation and conservation of plant diversity in the Western Ghats through his extensive field explorations, research and publications.

Description

Herbs, 20–30 cm height, erect. Stem suffrutescent, branched, terete, densely hirsute, slightly ascending when young and glabrous on maturity, green; internodes 2.7–4.5 cm long. Stipules caducous, 5.5–11.0 × 3.5–4.0 mm, linear-lanceolate to triangular, entire, midrib absent, hirsute, pale green. Petiole 1.0–1.5 cm long, hirsute, pale green. Leaf 10.5–17.2 × 2.5–5.5 cm, elliptic-lanceolate, apex attenuate-acuminate, base cuneate-attenuate, entire, margin hirsute, patent hirsute on above and below the lamina, dark green above and pale green below; margin entire, hirsute. Lateral nerves 8–10 pairs, extending to the margin. Inflorescence terminal corymbose cyme, 2.5–4.0 cm wide. Peduncle 3.0–3.5 cm, slender, terete, densely hirsute. Bracts 12.0–15.5 × 2.5–3.0 mm, linear to falcate, apex attenuate, midrib present, pale green, sparsely hirsute. Bracteoles 7.0–9.0 × 1.5–2.0 mm, linear to falcate, apex attenuate, midrib present, pale green, sparsely hirsute. Pedicels 0.75–1.25 mm long, sparsely hirsute, pale green. Flowers homostylous, 14.0–15.0 mm long, lilac. Hypanthium 1.25–1.5 × 2.00–2.25 mm, cupuliform, sparsely hirsute, pale green. Calyx lobes 1.75–2.00 mm long, triangular, apex acute, keel prominent, sparsely hirsute, pale green. Corolla tube 9.5–12.0 mm long, infundibuliform, sparsely hirsute outside, densely appressed puberulous inside, a villose ring at middle of the corolla tube inside. Corolla lobes 2.5–3.0 × 1.75–2.00 mm, broadly ovate, apex acute, sparsely hirsute outside, densely appressed puberulous inside. Stamens inserted, adnate to the middle of the corolla tube; filaments 2.0–2.5 mm, oblong-linear, glabrous; anther 1.75–2.00 mm,

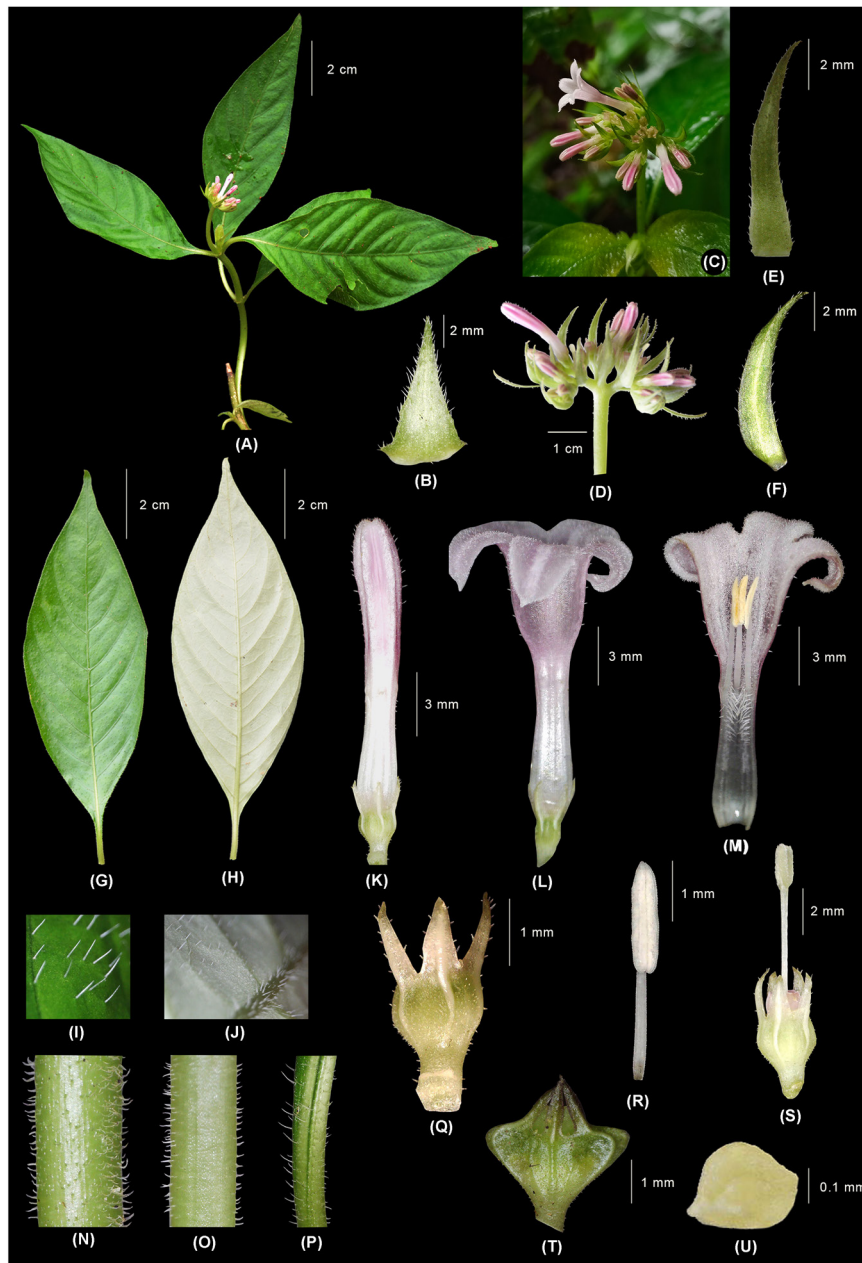


Figure 1. *Ophiorrhiza jomyi* Ebin, Sreehari & Joby sp. nov. (A) Habit, (B) stipule, (C–D) inflorescence, (E) bract, (F) bracteole, (G–H) adaxial and abaxial side of leaf, (I) indumentum on the upper surface of lamina, (J) indumentum on the lower surface of lamina, (K) flower bud, (L) single flower, (M) flower L.S., (N) indumentum on the stem, (O) indumentum on the peduncle, (O) indumentum on the petiole, (Q) hypanthium cup, (R) stamen, (S) gynoecium, (T) fruit, (U) seed.

oblong-linear, white-yellow. Stigma bilobed, 1.00–1.25 mm long, oblong, apex obtuse, papillate; style 4.0–4.5 mm long, slender, glabrous; ovary 1.00–1.25 × 1.75–2.00 mm, cupuliform; disc 0.4–0.6 × 1.0–1.3 mm. Capsule 2.5–4.5 × 4.5–6.0 mm, obcordate, bilocular, sparsely-hirsute; locules ovate. Seeds 0.4–0.7 × 0.3–0.5 mm, irregularly angled, glabrous, brown.

Phenology

Flowering and fruiting during May–June.

Distribution and ecology

Ophiorrhiza jomyi is currently known only from the type locality, the Vagamon hills, Kerala, India. The species grows in the moist shady areas of an evergreen forest at 965 m a.s.l. Only a few populations have been observed in the type locality. This species is found associated with *Hydrocotyle javanica* Thunb., *Elatostema lineolatum* Wight., *Elatostema heyneanum* (Wedd.) Hallier f., *Oreocnide integrifolia* (Gaudich.) Miq., *Ficus amplocarpa* Govind. & Masil. and *Lasianthus acuminatus* Wight.

Conservation status

This new species has so far only been collected from the type locality. The area of occupancy is estimated to be less than 4 km² and the known populations comprise a maximum of 30–35 plants. This species is currently assigned as ‘Data Deficient’ (IUCN Standards and Petitions Committee 2024). Further studies and more surveys have to be conducted for this species. The ex situ planting strategy of the species was successful.

Similar species

Ophiorrhiza jomyi is similar to *O. eriantha* Wight and *O. meenachilarensis* Robi and Balan in having erect habit, terete stem, corymbose cymose inflorescence, homostylous flower, persistent bracts and bracteoles, infundibuliform corolla, inserted stamens and brown seeds. But the new species differs from the latter by several morphological characters. The morphological comparison of the three species is summarized in Table 1.

Specimens examined

Ophiorrhiza eriantha India, Kerala: Kottayam Distr. Travancore hill range, May 1937, E. Barnes 1594 (K!, digital image); Thiruvananthapuram Distr., hill top from Athirumala, 14 Oct. 1988, N. Mohanan 4248 (CALI!, digital image). *Ophiorrhiza meenachilarensis*: India, Kerala, Kottayam district, Vagamon Hills, 1000 m, 17 June 2018, A.J. Robi and Anoop P. B. 16881 (MH!); same location, 1000 m, 6 June 2025, Ebin and Sreehari 2823 (DSAH!). *Ophiorrhiza jomyi*: India, Kerala: Kottayam district, Vagamon Hills, moist shady areas of an evergreen forest, 912 m a.s.l., 24 May 2024, Ebin and Sreehari 2824 (Paratype: DSAH!); same location, moist shady areas of an evergreen forest, 912 m a.s.l., 6 June 2025, Ebin and Sreehari 2825 (Paratype: DSAH!).

Conclusion

This study describes *Ophiorrhiza jomyi*, a new endemic species from the Vagamon hills of Kottayam District, located in the southern Western Ghats of Kerala. The species occurs

Table 1. Morphological comparison of *O. jomyi* with *O. eriantha* and *O. meenachilarensis*.

	<i>O. jomyi</i>	<i>O. eriantha</i>	<i>O. meenachilarensis</i>
Habit	herb, 20.0–30.0 cm long	subshrub, 30.0–100.0 cm long	herb, 30.0–45.0 cm long
Stem	Densely hirsute, slightly ascending	Pubescent or glabrous	Densely villous-hirsute
Leaf	10.5–17.2 × 2.5–5.5 cm, elliptic-lanceolate, attenuate-acuminate at apex, patent hirsute hairs on, above and below	4.0–19.0 × 2.0–7.5 cm, elliptic-lanceolate, acuminate at apex, glabrous above, puberulous on the nerves beneath	8.0–17.5 × 2.5–6.0 cm, obovate-elliptic, acuminate to subfalcate apex, sparsely appressed pilose above, densely so beneath, especially along the veins
Petiole	1.0–1.5 cm long, densely hirsute	0.5–3.0 cm long, glabrous or puberulous	1.2–3.5 cm long, densely hairy
Stipule	5.5–11.0 mm, linear-lanceolate to triangular, acuminate to attenuate at apex, densely hirsute	5.0–15.0 mm, lanceolate, bifid at apex, glabrous or puberulous	8.0–12.0 mm long, ovate, acuminate at apex, bristly at margin
Peduncle	3.0–5.5 cm long, densely hirsute	0.3–5.5 cm long, villous	0.1–3.0 cm long, rusty villous
Flower	14.0–15.0 mm long, liliac	19.0–27.0 mm long, white or pinkish white or red	10.0–12.0 mm long, white
Bract and bracteole	dissimilar; bract 12.0–15.5 mm long, linear to falcate; bracteole 7.0–9.0 mm long, linear to falcate	dissimilar; bract 10.0–17.0 mm long, narrowly linear; bracteole 6.0–10.0 mm long, narrowly linear	similar; bract and bracteole 6.0–8.0 mm long, linear-lanceolate
Hypanthium	1.25–1.50 × 2.00–2.25 mm, cupuliform, sparsely hirsute	2.00–2.25 × 1.75–2.00 mm, obovoid, pubescent	0.8–1.0 × 0.6 mm, obovoid, glabrous
Calyx	1.75–2.0 mm, triangular, sparsely hirsute	1.5–2.0 mm long, subulate, pubescent	2.0–2.5 mm long, lanceolate, bristly outside
Corolla tube	9.5–12.0 mm long, sparsely hirsute outside, densely puberulous and with a villous ring at the middle of the inside	16.00–24.75 mm long, villous outside, glabrous inside without a ring of hairs at the middle of the tube	6.0–8.0 mm long, hispid outside, appressed pubescent and with a ring of hairs at the middle of the tube inside
Corolla lobe	2.5–3.0 mm long, broadly ovate	5.0–7.0 mm long, broadly ovate	2.5–3.0 mm long, ovate-lanceolate
Stamen	inserted at the middle of corolla tube, filaments 2.0–2.5 mm long, anthers 1.75–2.0 mm long	inserted at the middle of corolla tube, filaments 2.0–2.75 mm long, anthers 3.0–3.5 mm long	inserted at the base of corolla tube, filaments 1.0–1.5 mm long, anthers 1.5–1.6 mm long
Style (mm)	4.0–4.5	4.0–5.5	7.0–8.0
Stigma	lobes 2; 1.0–1.25 mm long, oblong, obtuse at apex, papillate	lobes 2; 2.50–3.25 mm long, lanceolate, acute at apex, glabrous	lobes 2; 1.0 mm long, ovate-orbicular, obtuse at apex, glabrous
Capsule	2.5–4.5 × 4.5–6.0 mm, sparsely hirsute	2.50–3.25 × 7.0–8.5 mm, pubescent	4.0–5.0 × 6.0–7.0 mm, hispid
Seed	0.4–0.7 × 0.3–0.5 mm, irregularly angled	0.6 × 0.5 mm, 4–6 angular	0.4 × 0.3 mm, irregularly angled

in the moist shady areas of evergreen forests. *Ophiorrhiza jomyi* adds to the expanding list of Rubiaceae species in the region, emphasizing the botanical richness and ecological significance of the Vagamon landscape. This discovery reinforces the necessity for sustained floristic exploration in under-documented areas of the Western Ghats and calls for proactive conservation strategies. The present work enhances the taxonomy of the genus *Ophiorrhiza* and underlines the essential role of systematic field research in documenting and conserving India's rich plant diversity.

Key to similar species

1. Leaf elliptic-lanceolate; stipule linear-lanceolate or triangular; bract and bracteole dissimilar; stamens inserted at the middle of corolla tube; filaments 2.0–2.5 mm long; style 4.0–5.5 mm long 2
- Leaf obovate-elliptic; stipule ovate; bract and bracteole similar; stamens inserted at the base of corolla tube; filaments 1.0–1.5 mm long; style 7.0–8.0 mm long *O. meenachilarensis*
2. Leaves glabrous above, puberulous on the nerves beneath; stipule bifid at apex; flower 19.0–27.0 mm long; corolla without a ring of hairs at the middle of the tube inside; stigma glabrous; seed 4–6 angular *O. eriantha*
- Leaves with patent hirsute hairs on above and below; stipule acuminate to attenuate at apex; flower 14.0–15.0 mm long; corolla with a villose ring at the middle of the tube inside; stigma papillate; seed irregularly angled *O. jomyi*

Acknowledgements – All authors sincerely thank Dr Kanchi N. Gandhi, Senior Nomenclatural Registrar at the Harvard University Herbaria and Libraries, for his guidance on plant nomenclature. Sreehari Sivan Nair extends his gratitude to the Management of St. Teresa's College, Ernakulam, the Department of Botany, and the Curator of DSAH for their support. Joby Paul expresses his appreciation to the STC Herbarium and the Department of Botany, St. Thomas College, Thrissur, for their institutional support.

Funding – The authors received no specific funding for this work.

Conflict of interest – The authors declare no conflict of interest.

Author contributions

Ebin Padiyara Joy: Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Resources (equal); Software (equal); Supervision (equal); Validation (equal); Visualization (equal); Writing – original draft (equal); Writing – review and editing (equal). **Sreehari Sivan Nair:** Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Resources (equal); Software

(equal); Supervision (equal); Validation (equal); Visualization (equal); Writing – original draft (equal); Writing – review and editing (equal). **Joby Paul:** Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Resources (equal); Software (equal); Supervision (equal); Validation (equal); Visualization (equal); Writing – original draft (equal); Writing – review and editing (equal).

Data availability statement

This article has no additional data.

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