

# A new species of *Argyreia* (Convolvulaceae) from the southern Western Ghats, Tamil Nadu, India

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**Abstract:** *Argyreia lakshminarasimhanii* S.Shalini, Sujana, Arisdason & D.Maity a new species of Convolvulaceae from the southern Western Ghats of Tamil Nadu is described and illustrated here. The new species is morphologically different from its closely related species *A. involucrata* C.B.Clarke especially in its habit, shape, apex and texture of leaves, attachment of the stamens and in the length of the filaments. The micro-morphological features of pollen grains are provided.

**Keywords:** *Argyreia lakshminarasimhanii*, Climber, Megamalai, Pollen morphology, Taxonomy.

## Introduction

*Argyreia* Lour. (Convolvulaceae) comprises c. 140 species and is distributed predominantly in the tropics of Asia (Staples & Traiperm, 2017; Traiperm & Suddee, 2020), except for four species with disjunct distribution in Madagascar (Derooin, 2001). The genus is represented by 44 species and 3 varieties in India (Shalini *et al.*, 2017) and the country can therefore be considered to be one of its centres of diversity. In India, especially the Western Ghats in Kerala and Tamil Nadu, accounts for the discovery of a number of new species and distributional records in *Argyreia*. The occurrence of a high degree of morphological polymorphism in *Argyreia* has generally led to misidentification of species in the past. Many species that are confined to Peninsular India of a number of complex groups

could possibly be described as new, if circumscription of every species in a complex group is carried out carefully.

During revisionary studies on the genus *Argyreia* in India, a few specimens were collected from the foothills of Megamalai (High Wavy Mountains) in Theni district of Tamil Nadu during July and September 2018. Critical study of the relevant literature (Clarke, 1883; Cooke, 1908; Gamble, 1922), and comparison with specimens and digital images of closely allied species, *A. involucrata* C.B.Clarke deposited in Indian (BSI, CAL, MH) and foreign herbaria (BM, E, K, P) revealed that the specimens of the present collections are clearly distinct from hitherto hence described here as a new species, with detailed description, illustration, and information on flowering and distribution. In addition, the pollen morphology of the new species and *A. involucrata* is compared (Fig. 3). The new species also shows similarity with *A. boseana* Santapau & V.Patel and *A. bracteata* Choisy by their foliaceous bracts. A comparison of morphological characters between the new species and its closely allied species is provided in Table 1.

***Argyreia lakshminarasimhanii*** S.Shalini, Sujana, Arisdason & D.Maity, **sp. nov.** **Figs. 1 & 2**

This new species most closely resembles *A. involucrata* C.B.Clarke in leaf shape (ovate, longer than broad), sub-capitate cymes, large bracts but can easily be distinguished from the latter by densely tomentose abaxial leaf surface, retuse leaf apex, and short stamens, adnate to basal part of corolla tube.



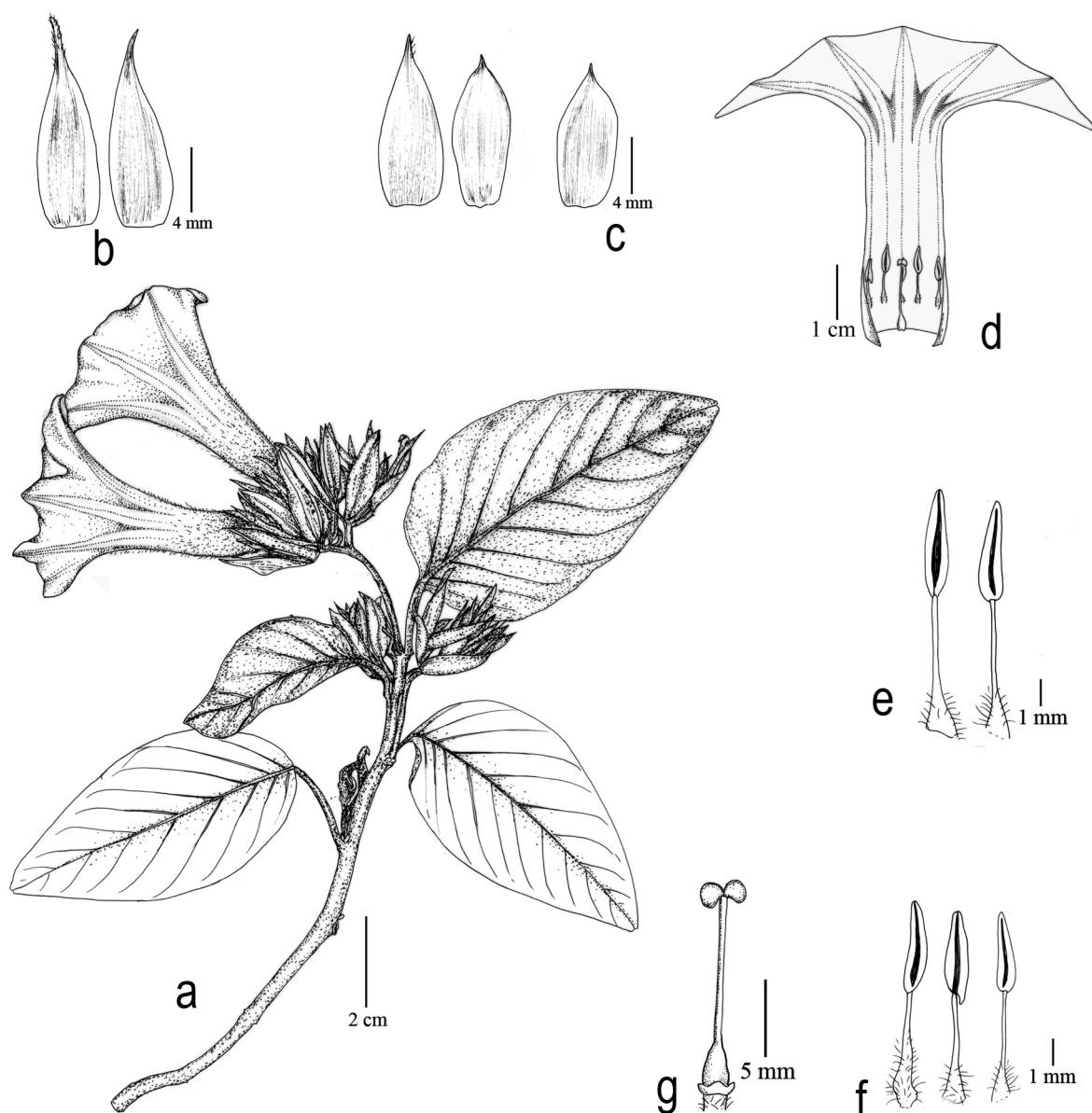
Fig. 1. *Argyreia lakshminarasimhanii* S.Shalini, Sujana, Arisdason & D.Maity: **a.** Habitat; **b.** Habit (part); **c.** Flower (photos by K.A. Sujana).

*Type:* INDIA, **Tamil Nadu**, Theni district, foothill of Megamalai, on the ghat road, N 9°43–34", E 77°25'11", 999.5 m, 11.07.2018, *K.A. Sujana & S. Shalini* 70527 (holo CAL!; iso MH!, CUH!).

Woody, robust climber. Stems hollow, terete, white

tomentose. Leaves ovate, elliptic-ovate or ovate-lanceolate, 7–10.6 × 4.8–6 cm, obtuse or rounded or sometimes truncate at base, entire along margins, shortly obtuse, blunt or retuse at apex, leathery, adaxial surface glabrous, brownish green, abaxial

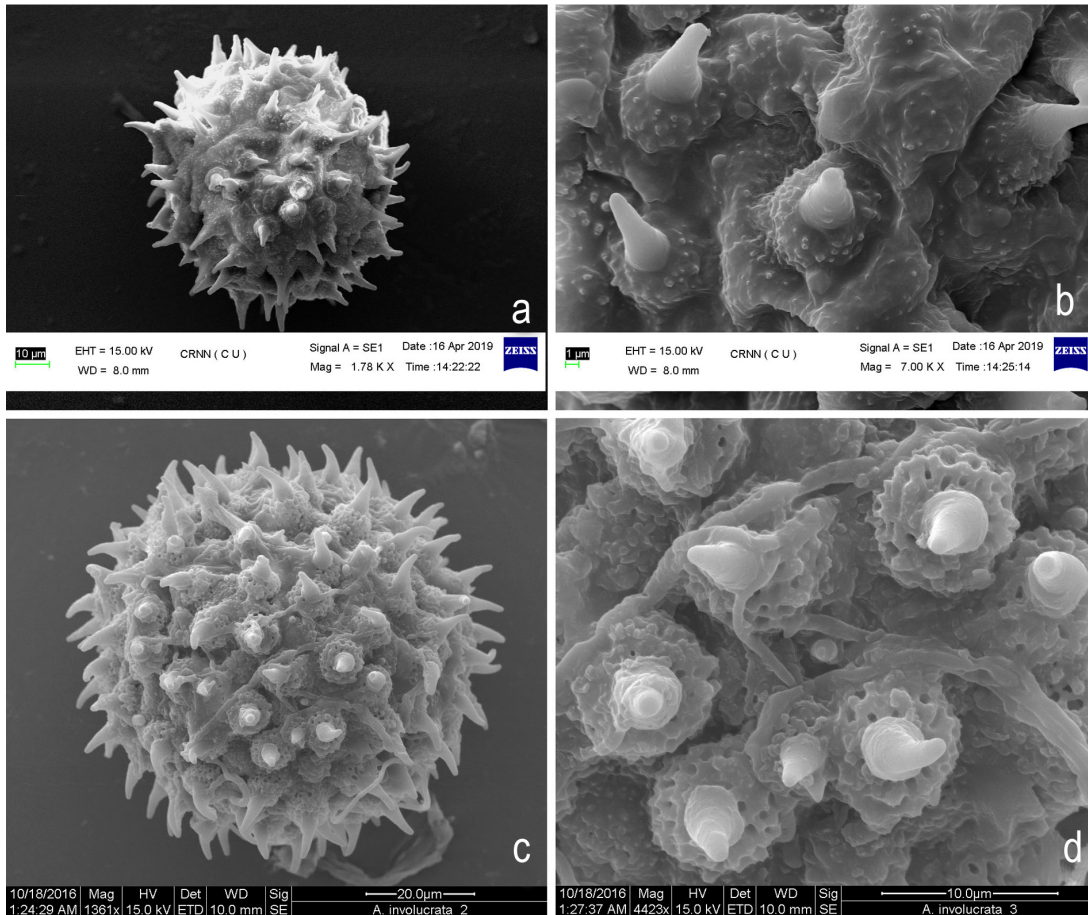




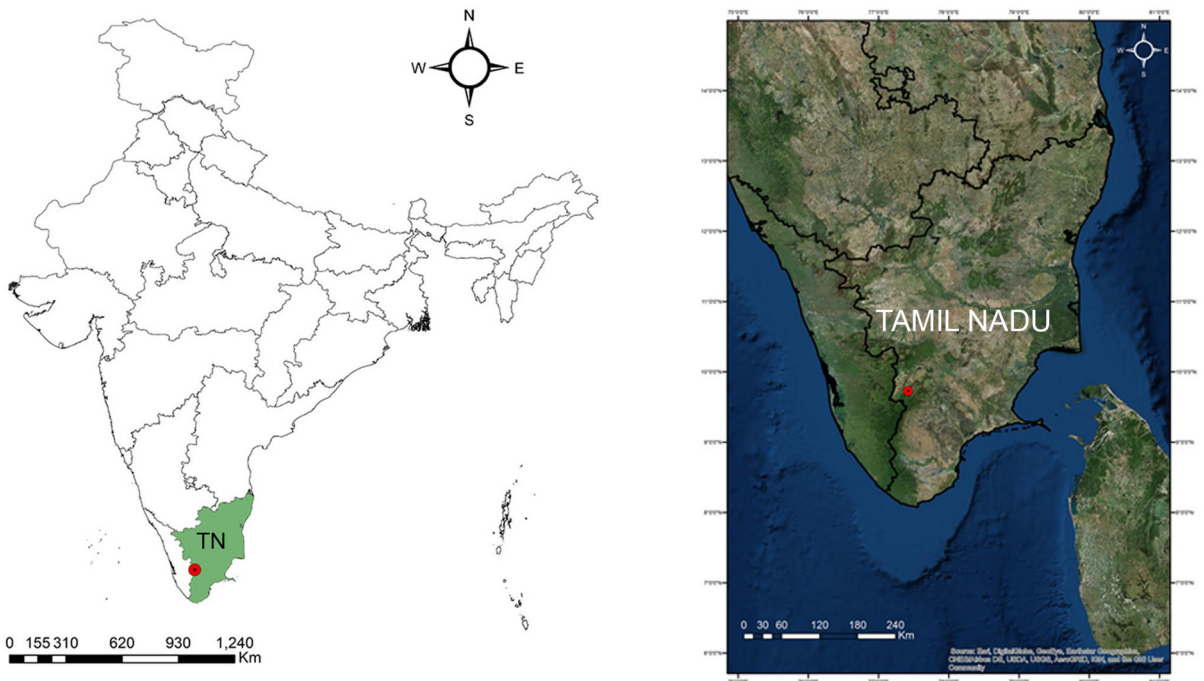
**Fig. 2.** *Argyreia lakshminarasimhanii* S. Shalini, Sujana, Arisdason & D. Maity: **a.** Flowering branch; **b.** Outer sepals; **c.** Middle and inner sepals; **d.** Corolla split-open; **e.** Longer stamens; **f.** Shorter stamens; **g.** Gynoecium (from K.A. Sujana & S. Shalini 70527; **a–c** and **e–g** drawn by D.K. Sah, and **d** by M. Middy).

surface densely white-tomentose; midrib and lateral veins conspicuous on both surfaces but more prominent and raised on abaxial surface, canaliculate above, thick towards base, densely tomentose; lateral veins 9–11 pairs; petioles terete, stout, 2–3.5 cm long, curved and swollen at base, densely tomentose. Inflorescence axillary, densely sub-capitate cymes, 10–12-flowered; peduncles stout, terete, equaling the petioles or exceeding, 2–7 cm long, densely tomentose. Bracts foliaceous,

green; outer bracts elliptic or elliptic-lanceolate, 2.5–4 × 0.5–1 cm, tapering at base, obtuse or retuse at apex, 6-veined, glabrous inside, white-tomentose outside; inner bracts longer, narrower, elliptic-oblong or linear-oblong, 1.5–3 × 0.3–0.8 cm, acute with a short mucro at apex, 5-veined, densely white tomentose outside, glabrous inside; pedicels 2–3 mm long, densely tomentose. Sepals 5, unequal; outer 2 ovate, 11.5–13 × 3.8–4 mm, with thick long acuminate, sometimes slightly curved at apex,



**Fig. 3.** SEM micrographs of pollen grains: **a & b.** *Argyreia lakshminarasimhanii* S.Shalini, Sujana, Arisdason & D.Maity: **a.** Entire pollen grain; **b.** Close-up of exine ornamentation; **c & d.** *A. involucrata* C.B.Clark: **c.** Entire pollen grain; **d.** Close-up of exine ornamentation.



**Fig. 4.** Distribution of *Argyreia lakshminarasimhanii* S.Shalini, Sujana, Arisdason & D.Maity (red dot indicates type locality) [drawn using the software ArcGIS 10.5].

slightly scarious at margins; middle one ovate, *c.* 10.8 × 4.8–5 mm, with thick short acuminate at apex, scarious on one margin, hairy outside only on exposed portion except on scarious margin; inner 2 ovate or ovate-oblong 9–10 × 3.5–4 mm, with a sharp mucro at apex, hairy on midrib outside, glabrous inside in all sepals. Corolla infundibular, 5–5.5 cm long, pink, midpetaline bands with white trichomes, mouth slightly lobed; tube *c.* 4 cm long, hairy outside. Disk annular, *c.* 2 × 1 mm, slightly lobed. Stamens 5, included, adnate at 3–5 mm above the base of corolla tube; filaments unequal, longer two, 4–5 mm, shorter three 3–4 mm, glandular indumentum and dilated at base; anthers oblong, 3–4 mm long. Pollen grains pantoporate, oblate-spherical; exine spinous, bulbous bases of spines with minute tubercles (**Fig. 3a & b**). Ovary conical, 1–2 × *c.* 0.5 mm, glabrous; style inserted, 0.8–1 cm long, glabrous; stigma bi-globose. Fruits not seen.

*Flowering & fruiting:* Flowering from July to September; fruiting is not observed.

*Habitat:* Semi-evergreen and moist deciduous forests at an elevation of about 1000 m.

*Etymology:* The species epithet refers to Dr. P. Lakshminarasimhan, former senior scientist of Botanical Survey of India and research supervisor of the first author, for his significant contributions to Indian taxonomy.

*Distribution:* Presently known only from the type locality, Megamalai, Theni district, Tamil Nadu, southern India, possibly endemic (**Fig. 4**). Found climbing on trees along the ghat roads on the way to the entrance of Megamalai Wildlife Sanctuary.

*Specimens examined:* INDIA, **Tamil Nadu**, Theni district, foothill of Megamalai, N 9°43'43" E 77°25'11", 999.5 m, 12.07.2018, *K.A. Sujana & S.*

**Table 1.** Comparison of morphological characters between *A. lakshminarasimhanii* and its closely allied species.

Characters		<i>A. boseana</i> Santapau & V.Patel	<i>A. bracteata</i> Choisy	<i>A. involucrata</i> C.B.Clarke	<i>A. lakshminarasimhanii</i> , S.Shalini, Sujana, Arisdason & D.Maity
Leaf shape		Ovate to orbicular (broader than long)	Ovate to broadly ovate, sometimes broadly cordate-ovate	Cordate-ovate or broadly ovate, or elongate-ovate (longer than broad), rarely ovate-lanceolate	Ovate, elliptic-ovate or ovate-lanceolate
Leaf apex		Acute, acuminate or apiculate	Acute-retuse or emarginated	Acute or acuminate	Shortly obtuse, blunt or retuse
Leaf base		Cordate to truncate	Deeply to shallowly cordate	Cordate or rounded	Rounded or truncate
Leaf adaxial surface		Glabrous	Sparingly hairy to glabrous	Strigose to glabrous	Glabrous
Leaf abaxial surface		Sparingly hairy to glabrous	Silky-sericeous	Sparingly hairy to sericeous	Densely white-tomentose, not shining
Sepals	Size	Unequal	Subequal	Unequal	Subequal
	Apex	Acuminate	Acute	Caudate	With a thick long acuminate
	Outer sepals	Outer two abruptly long acuminate	Outer two acute	Outer two long-caudate	Outer two abruptly short acuminate
Stamens	Adnation (attachment)	Below the throat of the corolla tube	Below the throat of the corolla tube	At the throat of the corolla tube	Base of the corolla tube
	Length	1–1.4 cm	1.2–1.5 cm	1–1.5 cm	0.6–0.9 cm

Shalini 70531 (CAL); *ibid.*, 21.09.2018, K.A. Sujana & S. Shalini 70575 (MH).

**Notes:** The adnation (attachment) of stamens at the base of the corolla tube is the most important diagnostic feature of this novel taxon. In all the known species of *Argyreia* in India, the stamens are always adnate to the corolla either at the throat or just below it, whereas in *A. lakshminarasimhanii* the stamens are very short and adnate to the basal part of the corolla tube. The pollen exine architecture in the new species is different from its closest relative *A. involucrata*. The swollen bases of the spines possess minute tubercles in *A. lakshminarasimhanii* whereas in *A. involucrata* the swollen bases of the spines possess perforated polygonal pits (**Fig. 3c & d**). The complete absence of perforations in the exine wall immediately separates the new taxon from its closest relative. Furthermore, the leaves of the new species are leathery with glabrous upper surface while the leaves of *A. bracteata* and *A. involucrata* are not leathery but hairy to sparingly hairy on both surfaces and in *A. boseana* they are glabrous on both surfaces.

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