Taxonomy and distribution of Andrographis longipedunculata (Acanthaceae)

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Abstract

Andrographis longipedunculata (Sreem.) L.H. Cramer (Acanthaceae), a lesser known endemic species of India is reported here for the first time from Myanmar and twelve more states of India. Also, illustrations, colour photographs, Scanning Electron Micrographs of pollen grains and seeds and a comparative table showing differences between its allied species, A. echioides are provided to facilitate accurate identification.

Keywords: Andrographis, Distribution, Indoneesiella, Myanmar, Taxonomy

Introduction

Sreemadhavan (1967) proposed a new genus, Neesiella Sreem. (nom. illeg.) to accommodate Andrographis echioides (L.) Nees (= Justicia echioides L.) and a new species, Neesiella longipedunculata Sreem. based on the collection [K. Subramanyam 4696] from Nagpur district in Maharashtra. He later realised that his Neesiella (1967) is a later homonym of Neesiella Schiffn. (1893) and therefore provided a substitute name, Indoneesiella Sreem. in 1968. However, Cramer (1996) reduced it to a subgenus of Andrographis Wall. ex Nees and proposed a necessary combination, A. longipedunculata (Sreem.) L.H. Cramer.

The present paper is a part of a systematic study on the genus Andrographis in India (Gnanasekaran, 2015), which is primarily based on the critical examination of fresh and herbarium specimens housed at BSD, BSI, BSJO, CAL, CALI, E, G, MH, P, RHT, SKU and SUK. The examination of specimens revealed that majority of A. longipedunculata specimens have been mistakenly identified as A. echioides (L.) Nees, an allied species and also showing an extended distribution from thirteen more states of India hitherto not recorded. Further, it is reported here as an new addition to the Flora of Myanmar for the first time. Thus, detailed taxonomic account along with illustration (Fig. 1), colour and Scanning Electron Micrographs of pollen grains and seeds (Fig. 2) and a comparative table showing differences between its allied species is provided here to facilitate accurate identification.


Figs. 1, 2


Herb, to 80 cm high. Stems 4-angled, swollen at nodes, densely glandular-villous. Leaves sessile,
Fig. 1. *Andrographis longipedunculata* (Sreem.) L.H. Cramer: a. Habit; b. Close-up of indumentum on a portion of stem; c,d. Leaf surfaces; c. adaxial, d. abaxial; e. Close-up of indumentum on a portion of inflorescence; f. Corolla – Split-open; g. Pistil; h. Fruit – Split-open; i. Seed (a [s. coll. 9671, MH], b–i [J.V. Sudhakar 126914, MH]).
ovate-lanceolate, 2–7.5 × 0.5–2.5 cm, base obtuse, acute or slightly cordate, margins entire, apex acute or obtuse; midrib conspicuous beneath; lateral veins 5–7 pairs, conspicuous beneath, strigulose intermixed with long glandular hairs on both surfaces. Inflorescence racemose, axillary, 4–10 cm long, often branched; axis 4-angled, densely glandular-pubescent; flowers distantly arranged (intertices 0.8–1.5 cm long), twisted at right angles to each other, one-sided; peduncles to 3 cm long, densely glandular-pubescent; flowers distantly arranged (interstices 0.8–1.5 cm long), twisted at right angles to each other, one-sided; pedicels indistinct, stout, 0–2 mm, densely glandular-pubescent. Bracts 2, subulate-lanceolate, 1.3–2.5 × 0.2–0.3 mm, apex acute, glandular-pilose. Bracteoles 2, linear, 0.5–0.8 × 0.05–0.15 mm, apex acute to acuminate, glandular-pilose. Calyx 5-lobed; lobes linear, subequal, 5–8 × 0.3–0.5 mm, margins hairy, apex acute to sub acuminate, strigulose inside, glandular-hairy outside. Corolla 2-lipped, 1–1.3 cm across, white; tube prominently ventricose, 6–7 × 1.2–1.8 mm, glandular-hirsute above, glabrous below; upper lip spathulate-oblong, margins entire, minutely 2-lobed (c. 0.5 mm long) at apex, 3.8–4.2 × 2–2.8 mm, glabrous inside, glandular-hirsute outside, 4-veined; lower lip 3-lobed, 4.5–5.5 × 3.5–4.3 mm, margins entire, apex acute or obtuse, glabrous inside except at centre of middle lobe, glandular-hirsute outside, dark purple-striped with yellow shade at centre; middle lobe narrowly ovate, 2–2.2 × 1.5–1.7 mm, hispid at centre, 3-veined; lateral lobes oblong, 1.2–1.4 mm across, 3-veined. Stamens 2, exserted, adnate to base of ventricose portion of corolla tube; filaments 5–7 mm long, distinctly dilated at base, retrorsely pilose above, glabrous below; anthers linear-oblong, 1.8–2.2 × 0.3–0.5 mm, woolly at base, deep purple. Ovary ellipsoid, 0.8–1 × 0.5–0.7 mm, glandular-hairy above, glabrous below, green; ovules 2 in each cell; style 8–10 mm long, sparsely antrorsely bristled-hairy, pinkish; stigma linear, green. Capsules ellipsoid, 8–10 × 3–4 mm, compressed at right angles to septum with a median longitudinal groove, apiculate, glabrous below, glandular-hairy towards apex, 4-seeded; seeds narrowly elliptic-ovoid, 3–3.2 × 1.8–2 mm, base oblique, apex obtuse, very hard, lacunosus (deeply pitted), echinate, glabrous, yellowish brown.

**Flow ering & fruiting**: July–March.

**Habitat**: Plains, foothills, wastelands and barren ground; ready colonizer; occasional.

**Distribution**: India [Andhra Pradesh, Bihar, Diu and Daman, Goa, Gujarat, Haryana, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal] and Myanmar.

**Conservation Status**: *Andrographis longipedunculata* is widespread in the Indian states and is also represented by a large collection in the Indian herbaria. Therefore, it is evaluated here as of ‘Least Concern [LC]’ using the IUCN Red List Categories and Criteria version 3.1 (IUCN, 2017).

**Etymology**: The specific epithet ‘longipedunculata’ denotes the long (5 longi) peduncle of the inflorescence.

**Inter-relationship**: *Andrographis longipedunculata* is morphologically very similar to *A. echioides* and it can be distinguished from this species as given in Table 1.

**Specimens examined**: INDIA, India Orientalis, s.die, Roxburgh s.n. (E00435367, E00435368, images!); India Orientalis, s.die, V. Jacquemont 1534 (P03590506, P03590512, P03590512, images!); India Orientalis, s.die, R. Wight 2239 (P03590511, image!).

**Andhra Pradesh**: Anantapur district, NS Right Canal, 125 m, 26.9.1985, V. N. Ramakrishnaih 3558 (SKU); Danduvari palli, 356 m, 28.12.2009, B. Ravi Prasad Rao & D. Veeranjanalu 35955 (SKU); Chittoor district, Chandragiri, 26.2.1914, s.coll. 10102 (MH); Cuddapah district, Palakonda R.F., 19.1.1987, D.A. Moulali 4682 (SKU); Guntur district, Nagarjunakonda hills, 26.9.1920, V. Narayanaswami 124 (CAL); Guntur district, Nagarjunakonda hills,
Fig. 2. *Andrographis longipedunculata* (Sreem.) L.H. Cramer: a. Flowering-twig; b. Flower; c,d. SEM micrograph of pollen; e–h. Optical and SEM micrographs of seeds.
way to Moluli forest, 20.10.1964, G. Panigrahi 3604 (CAL); Kaligora, 15.12.1964, C.M. Arun 3997 (CAL); Banda district, Kalinpur, December 1902, A.S. Bell s.n. (CAL); Jansi district, Barwasagar, 8.3.1959, T.A. Rao 8342 (BSD, image!). **West Bengal**: Midnapur district, Krishnager, 11.11.1997, T.K. Das & U.P. Samder s.n. (CAL); Chiligarh, 12.11.1997, T.K. Das & U.P. Samder s.n. (CAL). **MYANMAR, Upper Burma**: 12.9.1890, Abdul Huk s.n. (CAL); Upper Burma, February 1892, Abdul Huk s.n. (CAL); Mundu, September 1892, Abdul Huk s.n. (CAL); (CAL).

**Note**: Sreemadhavan (1967) indicated that the holotype of this species is housed at CAL. However, both holotype and isotypes are available only at MH.

**Geographical Distribution**

The scrutiny of literature pertaining to the geographical distribution of the species revealed that it was hitherto reported to occur only in Maharashtra (Sreemadhavan, 1968), Tamil Nadu (Kumari, 1987), Andhra Pradesh (Moulali, 1997), Karnataka (Babu, 2011), Gujarat and Rajasthan (Tiwari & Ravikumar, 2014), and Odisha (Murugan et al., 2017) from India. A thorough examination of specimens housed at various national and international herbaria in addition to the intensive field exploration in different parts of India resulted in ascertaining the occurrence of this lesser known endemic species from thirteen more states namely Bihar, Diu and Daman, Goa, Haryana, Jammu and Kashmir, Jharkhand, Kerala, Madhya Pradesh, Odisha, Punjab, Telangana, Uttar Pradesh and West Bengal from India. Further, while examining the specimens at CAL, senior author found a few specimens of this species collected from Upper Burma (Myanmar) were mistakenly identified as *A. echioides*. Therefore, the species is no longer can be considered as an endemic to India as it is reported here for the first time as a new record for Myanmar, showing an extended distribution of the species from outside of the Indian political boundaries.

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