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Stemodia L. (Plantaginaceae): A New Generic Record to the Flora Andaman and Nicobar Islands, India

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Abstract

The genus *Stemodia* L. (Plantaginaceae) is reported and described here as new record, with a single species *Stemodia verticillata* (Mill.) Hassl. for the Andaman and Nicobar Islands. A detail description, phenology, distribution along with photo plate has been provided to facilitate its easy identification.

Key words: *Andaman Nicobar Islands, New record, Plantaginaceae, Stemodia, Taxonomy*

Introduction

Andaman and Nicobar Islands (ANI) is a unique region of rich plant diversity with a higher rate of endemism in India and constitute a recognized hotspot of biodiversity (Singh *et al*., 2014, Singh and Ranjan, 2021). It is located about 1200 km from the mainland, India, comprising 572 islands and islets with tropical hot and humid climate impact. The floral elements of these Islands often show a close affinity with that of Indonesia, Malaysia, Myanmar, Thailand, and Sri Lanka.

Stemodia L. is a well recognized genus in the family Plantaginaceae with 53 species, distributed in the tropical and subtropical parts of the world (POWO, 2024). It is native to tropical America, naturalized in Sri Lanka and Java of South East Asian countries (Cramer, 1981). During floristic explorations in Andaman group of Islands, specimens of *Stemodia* L. (Plantaginaceae) were collected, after critical examination of those was identified as *Stemodia verticillata* (Mill.) Hassl. The perusal of relevant literature revealed that this genus has not been reported from ANI so far. The members of the genus prefer marshy habitats. In India the genus is distributed throughout the country and represented by three species *viz. Stemodia viscoa, S. serrata* and *S. verticillata* of them *S. verticillata* (Mill.) Hassl. is recorded here for the first time from ANI. Besides, this species is recorded only in six states of mainland India which includes Andhra Pradesh, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, and Tamil Nadu (Ramachandran *et al.* (1984); Sivarajan and Babu (1984); Betty and Ramachandran (2014); Bachulkar and Yadav (2000); Mahesh *et al.* (2021). Currently *S. verticillata* (Mill.) Hassl. is the only species representing the genus *Stemodia* L. of family Plantaginaceae from the ANI.

Materials and Methods

To verify the identity of the specimens critical analysis of morphological characters was carried out by comparing our collections with the herbarium specimens from Indian herbaria (CAL, PBL), online taxonomic databases and digital herbaria (POWO 2023; JSTOR 2023; The Herbarium Catalogue 2023) relevant taxonomic literature was also consulted. The floral parts were dissected and observed under the stereo zoom microscope (Leica S8APO) for detailed macro and micro-morphology. Field photographs of the species has been for easy identification. Specimens were processed and made into herbarium followed by standard methodology (Jain and Rao, 1977). The voucher specimens of the same were deposited at the Herbarium of the Andaman Nicobar Regional Centre, BSI, Port Blair (PBL).

Taxonomic Treatment

Stemodia verticillata (Mill.) Hassl. in Trab. Mus. Farmacol. 21: 110. 1909. (Fig.-1)

Annuals or short lived perennials, decumbent to prostrate, 15 cm high, stem branched from the base, branchlets round, densely hairy with gland tipped hairs. Leaves simple, lower opposite, upper whorled; lamina ovate, 0.5-1.5 × 0.3-1.2 cm, base cuneate, pinnately veined, sparsely hairy above, prominent below, especially along the veins; margin coarsely crenate to double crenate, acute at apex; petiole 0.6-1.2 cm long, slender, slightly winged. Flowers axillary, solitary, 2-3-flowers per node, pedicel c. 2 mm long; calyx persistent, deeply 5-lobed, lobes subequal, linear to lanceolate, acute at apex, 3-4.5 mm long with glandular hairs; corolla ca. 0.5 cm long, tube ca. 0.35 cm long, glandular pilose, violet with dark purplish nerves, bilabiate, lobes 5, unequal, sparsely hairy outside; upper lip slightly 2-lobed with clavate hairs at base, lobes broadly ovate; lower lip 3-lobed, lobes ovate to broadly ovate, inner corolla tube pubescent at lower side. Stamens 4, inserted, didynamous, fertile stamens 2, filament ca. 1.5 mm long, anther ca. 0.5 mm long; staminodes 2, longer than fertile stamens, filament ca. 2 mm long, glabrous; ovary bicarpellary, ellipsoid, slightly compressed, ca. 1.2 mm long, glabrous; style short, ca. 2 mm long, stigma slightly curved. Capsule orbicular to ovoid, glabrous, slightly compressed, ca. 3 mm, shorter than the calyx, brownish when mature, 4-valved, loculicidal. Seeds numerous, obovate, gray, with 8- longitudinal ribs.

Flowering and fruiting: September - November

Distribution: Distribution in India Andaman Islands, Andhra Pradesh, Arunachal Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu. **Global prevalence:** Tropical and Sub tropical parts of the world.

Specimen examined: India**,** South Andaman Port Blair, Nayagaon, Near DRDO Campus, 11.06522 N, 92.74372E, 18m, 21.10.2023 *RMK, PAD, MAK* 34501 (PBL).

Habitat and Ecology: Growing Marshy habitats in the association of *Mecardonia procumbens* (Mill.) Small and *Cynodon dactylon* (L.) Pers.

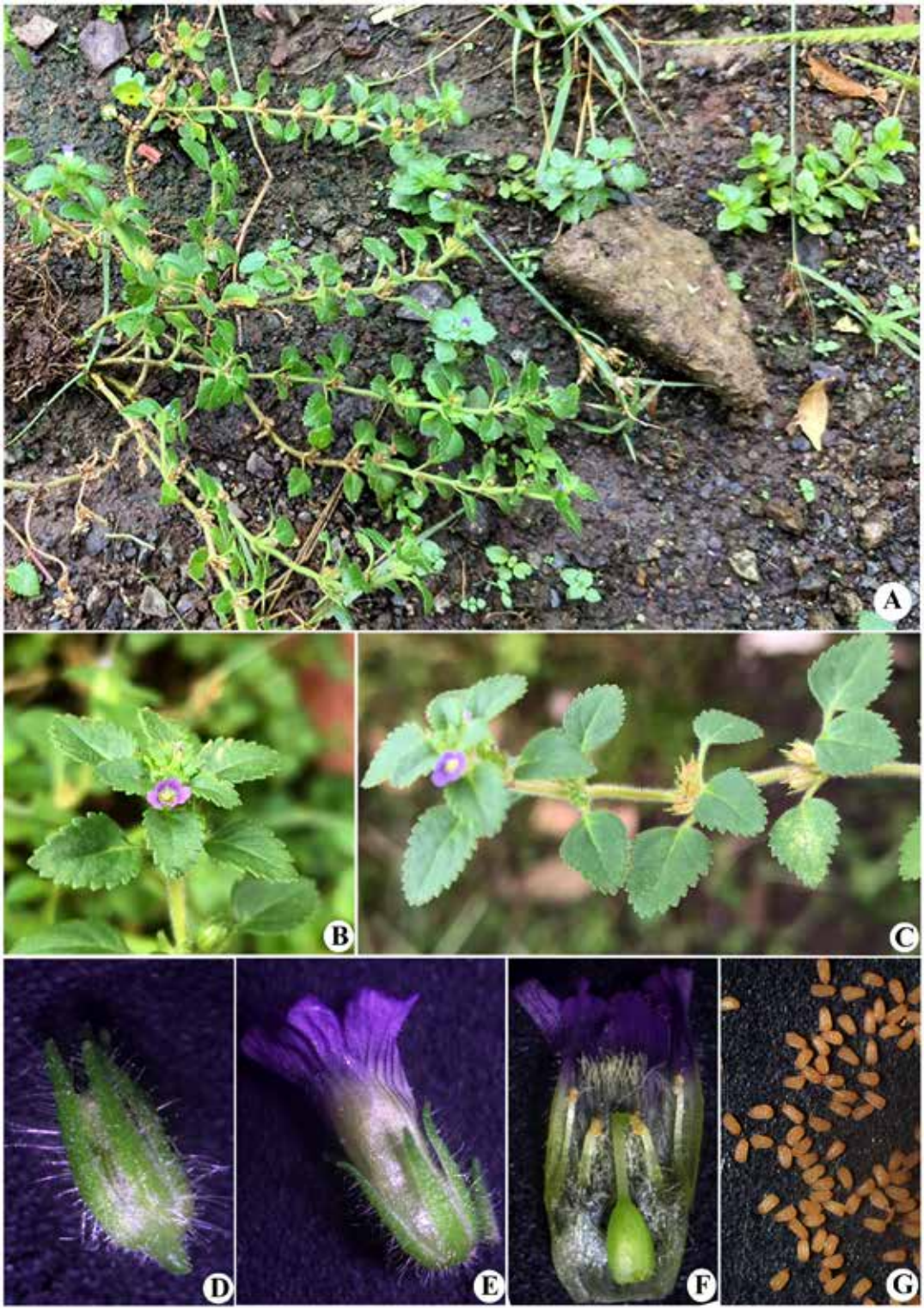

Fig.1. ***Stemodia verticillata*** **(Mill.) Hassl. A. Habit; B. Twig showing flower close up; C. Twig showing glandular hairs; D. Flower bud; E. Flower; F. L.S. of Flower; G. Seeds**

Conservation status

Stemodia verticillata (Mill.) Hassl. is currently known from a few localities of South Andaman such as Nayagaon, DRDO campus, but the identity of the other sporadic populations in the vicinity of the locality is yet to be confirmed. As part of a conservation program, it is presently under *ex-situ* conservation at Dhanikhari Experimental Garden-cum-Arboretum (DEGCA), Botanical Survey of India, Andaman and Nicobar Regional Centre, an excellent centre for collection and *ex-situ* as well *in situ* conservation of wild species in the Andaman and Nicobar Islands (Singh and Murugan, 2014; Singh *et al*., 2014).

Remarks

This species recorded only from few localities of South Andaman Islands and prefers moist habitats. It is noticeable that it always grows in the close association with *Mecardonia procumbens* (Mill.) Small, and confused with its morphology, it might be a reason this species is not easily spotted and recognized during field studies.

Discussion

ANI is one of the richest and unique phytogeographical region in India with higher number of endemism (Singh 2021; Singh et al. 2020a,b, 2021a,b; Singh and Ranjan 2021) where as Plantaginaceae (earlier Scrophulariaceae) need to be explored in more depth to understand the diversity. The genus was traditionally belonged to Scrophulariaceae *s.l.* However, based on recent molecular systematic researches, this genus together with other genera, i.e. *Bacopa*, *Digitaris*, *Dopatrium*, *Limnophila*, *Mecardonia*, *Scoparia*, *Veronica* etc. were suggested to be transferred into Plantaginaceae s. l. (APG IV, 2016). During the plant explorations carried out in Andaman group of Islands, authors spotted the genus *Stemodia* L. and described here as new generic record for the flora of ANI with single species.

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