

**SONERILA GADGILIANA, A NEW SCAPIGEROUS SPECIES OF
MELASTOMATACEAE FROM INDIA**

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Abstract

Sonerila gadgiliana, a new species collected from high altitude moss-covered dripping rocks of grassland-shola margins in Wayanad district, Kerala, India is described and illustrated. The species resembles *S. raghavana* Ratheesh *et al.*, *S. rotundifolia* Bedd. and *S. veldkampiana* Ratheesh *et al.*, but differs from leaf, inflorescence, peduncle, hypanthium, petal, anther, capsule and seed characteristics.

Introduction

The Melastomataceae Jussieu is a large family of about 188 genera with around 5,100 species, mainly distributed in tropics and also in subtropics, out of which about 1,550 species occur in the Old World (Stevens, 2012). The members of this family are easily recognized among dicots by having leaves with a characteristic acrodromous venation (Hickey, 1973) and numerous small, exalbuminous seeds. The family appears to be the largest clade of flowering plants characterized by this type of venation; only a few isolated taxa, e.g. *Heterocentron* Hook. & Arn., *Sonerila* Roxb., *Loreya nigricans* Triana and *Macairea rufescens* DC. have pinnate venation (Renner, 1993; Clausing and Renner, 2001).

The tribe Sonerileae (Melastomatoideae) occurs mainly in Southeast Asia and Madagascar, with a few species in the neotropics (Renner, 1993). Most of the Asiatic Sonerileae species belong to the taxonomically very poorly understood genus *Sonerila*, represented by caulescent and acaulescent herbaceous plants of shady habitats, often with basal rosettes of large, somewhat turgescens leaves, sometimes with tubers. Uniparous (scorpioid) cymes are particularly frequent in Sonerileae as commonly seen in *Sonerila*. Lundin and Nordenstam (2009) estimated the genus to have about 175 species distributed from Sri Lanka and India to the Indo-Pacific (Cellinese, 1997). Subsequent to later publications of additional new species, the genus is now with about 180 species and represents the largest and the only consistently trimerous genus in Sonerileae (except for the monotypic *Stussenia* C. Hansen and *Lithobium* Bongard) with the flowers having one or rarely two whorls of stamens, and as such easily differentiated.

Clarke (1879) in Hooker's Flora of British India recognized 43 species of *Sonerila* and provided names of three doubtful species. Out of the 43 species, eight species were treated as "stemless or almost stemless species" and only three, viz. *S. wallichii* Benn., *S. scapigera* Dalzell

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and *S. rotundifolia* Bedd. were from Peninsular India. Gamble (1919) also recognized the above three acaulescent species among the total 13 species of *Sonerila* in his Flora of the Presidency of Madras. Lundin (1998) made an extensive study of Melastomataceae with special emphasis on *Sonerila* of South India after his taxonomic study of the genus in Ceylon (Lundin, 1983). After Gamble's (1919) treatment, many new species were described and the genus is presently represented by about 50 species in India with high species diversity in the Western Ghats having 33 species and two varieties (Nayar, 1976; Giri and Nayar, 1985, 1986a, b, c, 1987a, b; Prakash and Mehrotra, 1988; Gopalan and Henry, 1989; Giri *et al.*, 1992; Ravikumar, 1999; Murugan and Manickam, 2002; Josephine *et al.*, 2003; Lundin and Nordenstam, 2009; Murugesan and Balasubramaniam, 2011; Ratheesh Narayanan *et al.*, 2013, 2014; Deepthikumary and Pandurangan, 2014; Sunil *et al.*, 2014).

During the field exploration for systematic studies in *Sonerila* of the Western Ghats, an interesting scapigerous herb was collected from Banasuramala, Wayanad District, Kerala, at altitude about 1700 m. Detailed observations and study revealed its novelty and distinctness from the hitherto known species, and is described and illustrated here as a new species.

***Sonerila gadgiliana* Ratheesh & Sivadasan, sp. nov.**

(Figs 1 & 2).

Diagnosis: *Sonerila gadgiliana* differs from *Sonerila rotundifolia* by having inflorescence with up to 12 flowers, an obscurely ridged hypanthium with sparsely glandular hairs, deeply cordate anthers, and tubercled seeds, and from *S. veldkampiana* Ratheesh *et al.* by having angular glandular hairy peduncle, sparsely glandular hairy hypanthium, petals with 2–4 glandular hairs along the midvein on abaxial side, shortly acuminate non-beaked anthers, and glandular hairy capsule. The new species differs from *S. raghaviana* Ratheesh *et al.* by having sparsely glandular hairy plants with non-overlapping basal-lobed green leaves, usually 2 inflorescences per plant, and seeds with prominent raphe.

Types: India, Kerala: Wayanad District, Banasuramala, moss-covered moist rocks in grassland-shola margins, about 1700 m, 16 Sep 2012, M.K. Ratheesh Narayanan MSSH 2388 (*Holotype:* CAL; *Isotypes:* MH, TBGT).

Paratypes: India, Kerala: Wayanad District, Kurichiarmala, about 1600 m, 18 Aug 2014, M.K. Ratheesh Narayanan & M.K. Nandakumar MSSH 1966 (TBGT).

Scapigerous herbs, attaining up to 15 cm high; rhizome small, up to 0.5 cm diameter, orbicular, white. Leaves radical, 3–5; petiole 3.5–5.5 cm long, adaxially grooved, glabrous; lamina ovate, 5–6 × 4–6 cm, base cordate, without overlapping margins, green with pink tinge below, leathery, margins distantly serrate, acute to shortly acuminate at apex, hairy above, glabrous below, pinnately veined, main nerves 3 pairs from base, prominent below, pinkish. Inflorescence unbranched scorpioid cyme, usually 2 per plant, 6–12-flowered; peduncle quadrangular, 8–15 cm long, sparsely hairy, hairs gland-tipped, light green; bract and bracteoles not prominent. Flowers 3-merous, light pink, pedicel angular, 0.4–0.5 cm long, longer than hypanthium, sparsely glandular hairy, light pink with green tinge; hypanthium c. 0.3 cm long, light pink with green tinge, glandular hairy, obscurely ridged. Calyx lobes 3, c. 0.1 cm long, broadly triangular, glabrous, greenish. Petals 3, elliptic to broadly obovate, pink, 0.5–0.6 × 0.4–0.5 cm, glabrous, shortly acute, mucronate at apex, midrib prominent with 2–4 glandular hairs on abaxial side. Stamens 3; filaments c. 0.3 mm long, filiform, glabrous, pinkish; anthers yellow, cordate at base, shortly acuminate at apex, non-beaked, glabrous. Style 0.7–0.8 cm long, deep pinkish at base; stigma capitate, glabrous. Capsules obcampanulate, pedicellate, 0.3–0.4 cm long, sparsely glandular hairy, green with pink tinge. Seeds many, minute, tubercled, greenish yellow, broadly oblong, raphe prominent, non-excurrent.

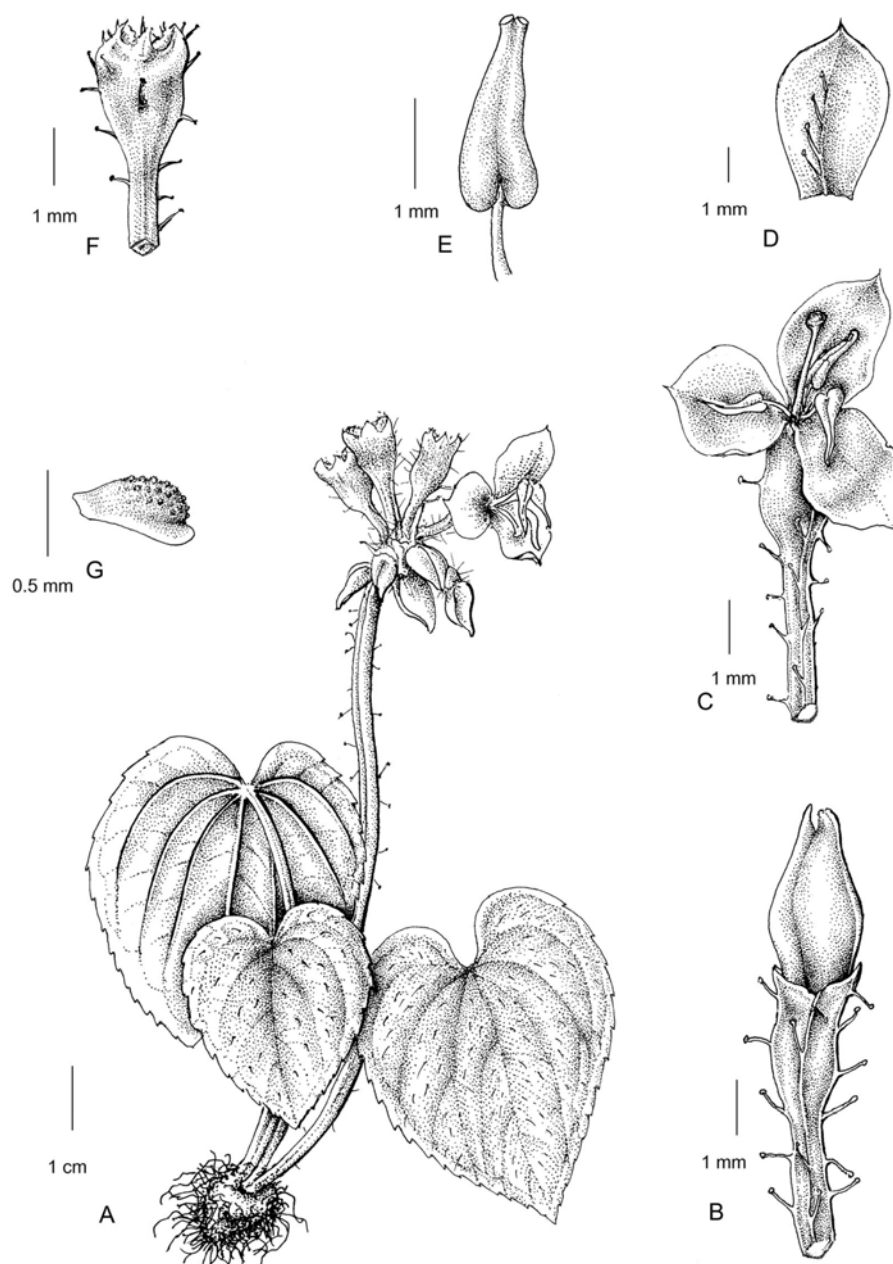


Fig. 1. *Sonerila gadgiliana* Ratheesh & Sivadasan, **sp. nov.** A. Habit; B. Flower bud; C. Mature flower; D. Single petal - abaxial side; E. Stamen; F. Young fruit; G. Seed. (Drawings by T. Shaju from live specimens)

Phenology: Flowering commences from early July with peak in August; fruiting during August–September.

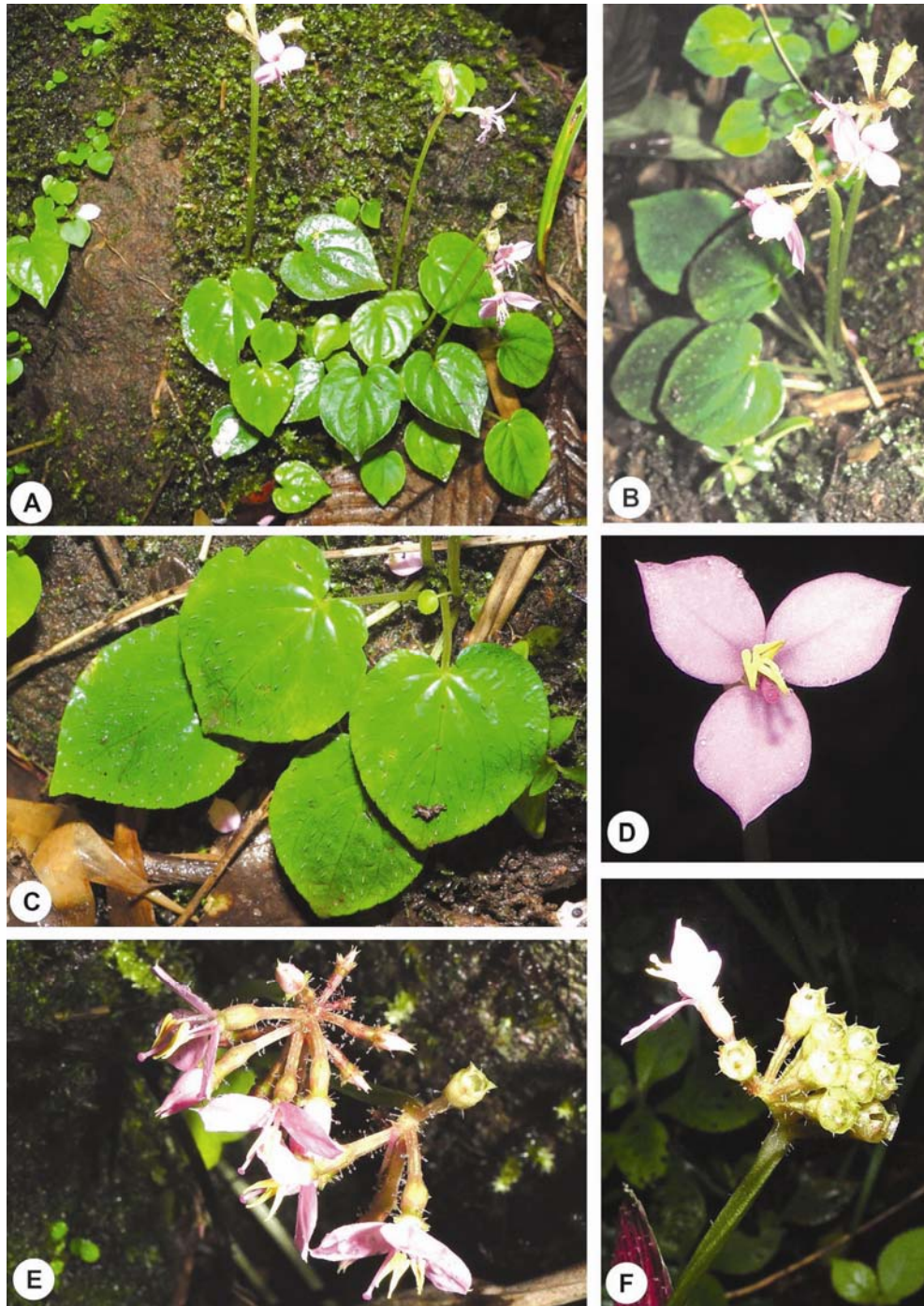


Fig. 2. *Sonerila gadgiliana* Ratheesh & Sivadasan, **sp. nov.** A. Habit; B. Plant with inflorescence; C. Leaves; D. Single flower; E. Flowers, flower buds and young fruit; F. Single flower and fruits - mature and young.

Comparison of morphological characters of *Sonerila gadgiliana* and the related species are provided in Table 1.

Table 1. Comparison of characters of *Sonerila gadgiliana* sp. nov. and related species.

Characters	<i>Sonerila gadgiliana</i> sp. nov.	<i>S. raghaviana</i>	<i>S. rotundifolia</i>	<i>S. veldkampiana</i>
Habitat	Shady wet rocks along shola margins	Open grasslands	Shady moist rocky places	Exposed rocky grasslands
Leaf	4–6 cm wide, green, basal lobes not overlapping, 8–10-nerved, 3 pairs of nerves arising from base and 1 or 2 pairs from the midrib, sparsely glandular hairy above, glabrous below	3–6 cm wide, brownish, basal lobes overlapping; 14-nerved, 3 pairs of nerves arising from base of the leaf and 4 pairs from the midrib, densely hairy above, sparsely hairy below	1.5–3.0 cm wide, pinkish, basal lobes not overlapping, 3 or 4 pairs of nerves from near the base, glabrous on both sides	5–7 cm wide, pinkish, basal lobes overlapping, 12-nerved, 4 pairs of nerves arising from base and 2 pairs from the midrib, sparsely hairy on both sides
Inflorescence	Usually 2 per plant, unbranched scorpioid cymes with about 6–12 flowers	Usually 5 or 6 per plant, unbranched scorpioid cymes with more than 12 flowers	Usually 1, unbranched scorpioid cymes with 1–4 flowers	Usually 1–3 per plant, branched or unbranched scorpioid cymes with about 35 flowers
Peduncle	Quadrangular, up to 15 cm long, sparsely glandular hairy	Quadrangular, up to 15 cm long, densely glandular bristly	Angular, up to 8 cm long, sparsely non-glandular hairy	Terete, up to 30 cm long, glabrous
Bract	Not prominent	Not prominent	Not prominent	Prominent, persistent, linear lanceolate
Hypanthium	Obscurely ridged, sparsely glandular hairy	Obscurely ridged, densely glandular bristly	Not ridged, glabrous	Obscurely ridged, glabrous
Petals	5–6 mm long, elliptic to obovate-acuminate, 2–4 glandular hairs on the midrib below	7–9 mm long, broadly obovate, 3–5 glandular hairs on the midrib below	8–9 mm long, orbicular-obovate, glabrous	9–10 mm long, broadly obovate, glabrous
Anthers	Shortly acuminate, non-beaked, deeply cordate at base	Shortly acuminate, non-beaked, deeply cordate at base	Shortly acuminate, non-beaked, truncate at base	Long acuminate, beaked, deeply cordate at base
Capsule	Obcampanulate, crowned by a narrow margin, sparsely glandular hairy	Obcampanulate, crowned by a broad margin, densely bristly	Hemispheric, crowned by a narrow margin, glabrous	Obcampanulate, crowned by a broad margin, glabrous
Seeds	Minutely tubercled; raphae non-excurrent	Prominently tubercled; raphae not prominent	Not tubercled; raphae non-excurrent	Minutely tubercled; raphae sub-excurrent

Etymology: The epithet is named in honour of Prof. Madhav Dhananjaya Gadgil, a renowned Indian ecologist, in recognition of his valuable research on ecology of Western Ghats and contributions to conservation of biodiversity.

Distribution and habitat: *Sonerila gadgiliana* grows on high altitude moss-covered moist rocks in grassland-shola margins at altitudes of 1600–1700 m in contrast to *S. raghavana* which grows in open grasslands. It is known only from the Banasuramala-Kurichiarmala hill ranges of the Wayanad district, Kerala. Small populations of this species are distributed at shady shola-grassland merging areas of the locality. The species appears during the onset of the South-West monsoon (June–July). Some of the associated species are *Argostemma courtallense* Arn., *Eria nana* A. Rich., *Impatiens lawsonii* Hook. f., *I. scapiflora* B. Heyne ex Roxb., *Peristylus spiralis* A. Rich. and *Strobilanthes* sp.

Conservation status: Only two well-separated populations of the species were noticed, one in Kurichiarmala and the other in Banasuramala at altitudes of 1600–1700 m and each population was with less than 50 individuals. Both the habitats were interspersed with patches of grasslands rendering the populations prone to forest fire. Effective efforts are essential to protect the existing populations. In the absence of any detailed observations and data on populations, the species is categorized as ‘Data Deficient’ (DD) (IUCN, 2012).

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