SONERILA GADGILIANA, A NEW SCAPIGEROUS SPECIES OF MELASTOMATAEAE FROM INDIA

M.K. RATHEESH NARAYANAN, M. SIVADASAN1,2, C.N. SUNIL3, M.K. NANDAKUMAR4, T. SHAJU5, A.H. ALFARHAN2 AND A.S.M. AMAL TAMIMI6

Department of Botany, Payyanur College, Edath P.O., Kannur 670 327, Kerala, India

Keywords: Kerala; Melastomatoideae; New species; Sonerileae.

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. raghaviana Ratheesh et al., S. rotundifolia and S. veldkampiana Ratheesh et al., but differs from leaf, inflorescence, peduncle, hypanthium, petal, anther, capsule and seed characteristics.

Introduction

The Melastomataeae 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 turgescent 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

---

1Corresponding author. E-mail: drmsivadasan@gmail.com
2 Department of Botany & Microbiology, College of Science, King Saud University, P.O. Box 2455, Riyadh 11451, Kingdom of Saudi Arabia
3Department of Botany, S.N.M. College, Maliankara P.O., Ernakulam 683 516, Kerala, India
4M.S. Swaminathan Research Foundation, Puthoorvayal P.O., Wayanad 673 121, Kerala, India
5Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Palode P.O., Thiruvananthapuram 695 562, Kerala, India
6Department of Biology, College of Science, Princess Nora bint Abdulrahman University, P.O. Box 87991, Riyadh 11652, Kingdom of Saudi Arabia
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 scapigeroius 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).


Scapigeroius 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.
Phenology: Flowering commences from early July with peak in August; fruiting during August–September.
Fig. 2. *Sonerita 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.**

<table>
<thead>
<tr>
<th>Characters</th>
<th>Sonerila gadgiliana sp. nov.</th>
<th>S. raghaviana</th>
<th>S. rotundifolia</th>
<th>S. veldkampiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat</td>
<td>Shady wet rocks along shola margins</td>
<td>Open grasslands</td>
<td>Shady moist rocky places</td>
<td>Exposed rocky grasslands</td>
</tr>
<tr>
<td>Leaf</td>
<td>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</td>
<td>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</td>
<td>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</td>
<td>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</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>Usually 2 per plant, unbranched scorpioid cymes with about 6–12 flowers</td>
<td>Usually 5 or 6 per plant, unbranched scorpioid cymes with more than 12 flowers</td>
<td>Usually 1, unbranched scorpioid cymes with 1–4 flowers</td>
<td>Usually 1–3 per plant, branched or unbranched scorpioid cymes with about 35 flowers</td>
</tr>
<tr>
<td>Peduncle</td>
<td>Quadrangular, up to 15 cm long, sparsely glandular hairy</td>
<td>Quadrangular, up to 15 cm long, densely glandular bristly</td>
<td>Angular, up to 8 cm long, sparsely non-glandular hairy</td>
<td>Terete, up to 30 cm long, glabrous</td>
</tr>
<tr>
<td>Bract</td>
<td>Not prominent</td>
<td>Not prominent</td>
<td>Not prominent</td>
<td>Prominent, persistent, linear lanceolate</td>
</tr>
<tr>
<td>Hypanthium</td>
<td>Obscurely ridged, sparsely glandular hairy</td>
<td>Obscurely ridged, densely glandular bristly</td>
<td>Not ridged, glabrous</td>
<td>Obscurely ridged, glabrous</td>
</tr>
<tr>
<td>Petals</td>
<td>5–6 mm long, elliptic to obovate-acuminate, 2–4 glandular hairs on the midrib below</td>
<td>7–9 mm long, broadly obovate, 3–5 glandular hairs on the midrib below</td>
<td>8–9 mm long, orbicular-obovate, glabrous</td>
<td>9–10 mm long, broadly obovate, glabrous</td>
</tr>
<tr>
<td>Anthers</td>
<td>Shortly acuminate, non-beaked, deeply cordate at base</td>
<td>Shortly acuminate, non-beaked, deeply cordate at base</td>
<td>Shortly acuminate, non-beaked, deeply cordate at base</td>
<td>Long acuminate, beaked, deeply cordate at base</td>
</tr>
<tr>
<td>Capsule</td>
<td>Obcampanulate, crowned by a narrow margin, sparsely glandular hairy</td>
<td>Obcampanulate, crowned by a broad margin, densely bristly</td>
<td>Hemispheric, crowned by a narrow margin, glabrous</td>
<td>Obcampanulate, crowned by a broad margin, glabrous</td>
</tr>
<tr>
<td>Seeds</td>
<td>Minutely tubercled; raphae non-excurrent</td>
<td>Prominently tubercled; raphae not prominent</td>
<td>Not tubercled; raphae non-excurrent</td>
<td>Minutely tubercled; raphae sub-excurrent</td>
</tr>
</tbody>
</table>
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. raghaviana 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).

Acknowledgements
The authors are grateful to the President and Principal of the Payyanur College, Payyanur; Manager, S.N.M. College, Maliankara; Director, M.S. Swaminathan Research Foundation (MSSRF), Chennai; and the Director, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram. Sincere thanks are expressed to Dr. J.F. Veldkamp, for critical remarks on the manuscript, and to Ms. V. Mini, Mr. Prajeesh Parameshwaran, Mr. Jayesh P. Joseph and Mr. K.T. Satheesh of the Community Agrobiodiversity Centre, MSSRF, Wayanad for their help. The second and sixth authors thankfully acknowledge the encouragements and support extended by the Deanship of Scientific Research, King Saud University, through the research group project no. RGP-VPP-135.

References
SONERILA GADGILIANA, A NEW SPECIES


(Manuscript received on 6 March 2015; revised on 3 May 2015)