



A new species of *Striga* section *Polypleurae* (Orobanchaceae) from southern Western Ghats of India

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Abstract

A new species of *Striga* from Tamil Nadu parts of Western Ghats of India is described and illustrated as *Striga kamalii* sp. nov. The new species shows similarity with *S. densiflora* in having a densely hispid stem, linear leaves, bracts longer than calyx, and oblong fruit shorter than calyx lobes, but differs in the 10-ribbed calyx, the glandular hairs on calyx and corolla tube, and the obovate-rounded petals. A detailed description, with data on distribution and parasitism together with relevant taxonomic notes and colour photographs are provided.

Key words: New species, Orobanchaceae, *Striga kamalii*, Tamil Nadu, Western Ghats

Introduction

The genus *Striga* Loureiro (1790: 22) belongs to the family Orobanchaceae (broomrape family), and has its centre of diversity in tropical Africa. Earlier the genus was accommodated in the family Scrophulariaceae, but based on morphological and molecular data the genus was transferred to Orobanchaceae (Olmstead *et al.* 2001). The genus comprises about 42 species with the highest diversity in tropical Africa (Jayanthi *et al.* 2014), where 28 taxa have been recorded of which 22 are endemic (Mohamed *et al.* 2001; Fischer *et al.* 2011). Only few taxa extend to the Arabian Peninsula and Asia, e.g. *S. lutea* Loureiro (1790: 22) and *S. gesnerioides* (Willdenow 1800: 338) Vatke (1875: 11) (Musselman & Parker 1981). Seven species were recorded so far from South India including the recent addition of two new species, viz. *Striga indica* Prabhu *et al.* (2013: 284) and *S. scottiana* Jeeva *et al.* (2012: 79).

All species of *Striga* are obligate root hemiparasites, and require some specific host plants for their survival (Botanga & Timko 2005). *Striga gesnerioides*, parasitizes on a variety of hosts belonging to the family Fabaceae, Convolvulaceae, Solanaceae, Vitaceae and Euphorbiaceae (Mohamed *et al.* 2001) and *S. indica* parasitic on *Euphorbia antiquorum* Linnaeus (1753: 450) (Jayanthi *et al.* 2014). The rest of the species are mostly parasitic on various members of Poaceae. Wettstein's (1895) treatment of *Striga* in Engler and Prantl's "Die Natürlichen Pflanzenfamilien", divides the genus into two sections based on the number of ribs on the calyx tube, viz. *S. sect. Pentapleurae* with 5-ribbed calyx and *S. sect. Polypleurae* with 10–15-ribbed calyx.

During recent field studies in Tamil Nadu, we encountered an unknown *Striga* species, parasitic on some Poaceae members at the campus of Bharathiar University, Coimbatore, Tamil Nadu during August 2011. Later we collected the specimen after one year from the same locality. The critical studies on the collected material have revealed that the species is related to *Striga densiflora* (Bentham 1836: 363) a species endemic to India, but differs in many characters. Detailed taxonomic studies with the perusal of relevant literature (Hooker 1884, Gamble 1924, Saldanha 1963, Matthew 1980) and critical comments from experts proved this to be a species hitherto unknown to science, which is described here.

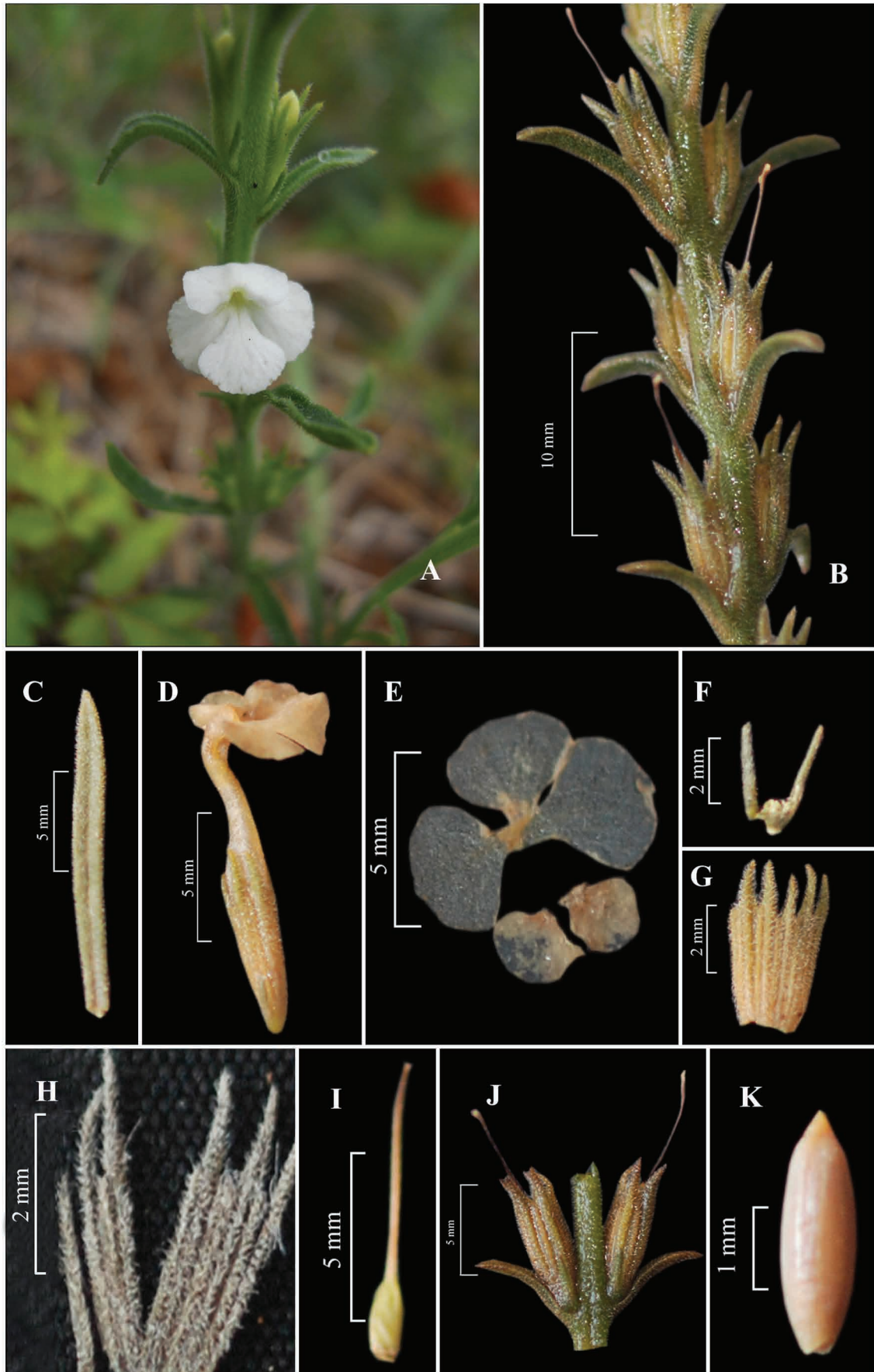


FIGURE 1. *Striga kamalii* sp. nov. A. Habit; B. Fruiting twig; C. Leaf; D. Flower; E. Corolla lobes; F. Bracteole; G. & H. Calyx; I. Ovary with style; J. Fruit with persistent calyx; K. Fruit (Photos: KM Prabhu).

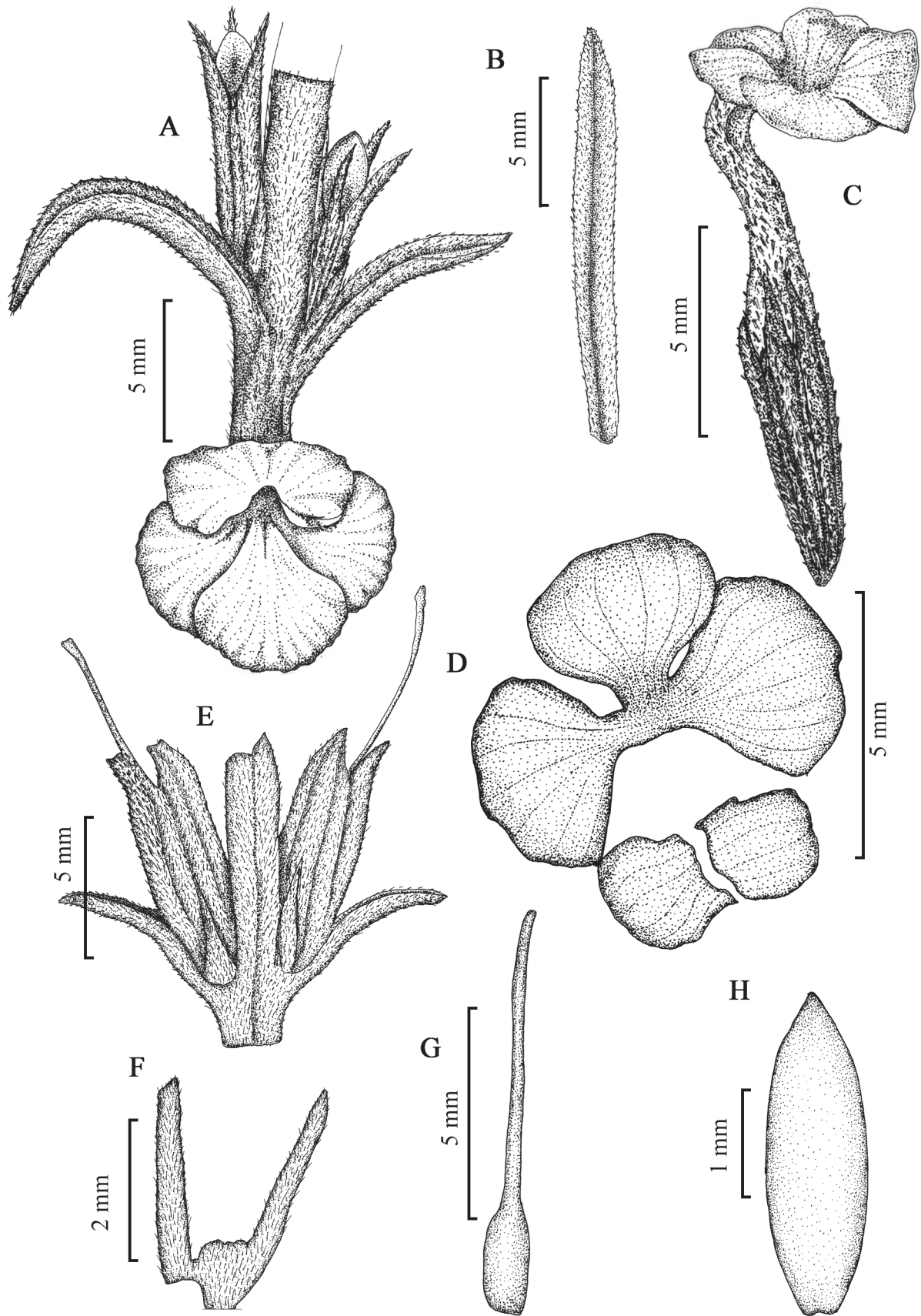


FIGURE 2. *Striga kamalii* sp. nov. A. Habit; B. Leaf; C. Flower; D. Corolla lobes; E. Fruit with persistent calyx; F. Bracteole; G. Ovary with style; H. Fruit.

Description of the new species

Striga kamalii Omalsree, K. M. Prabhu, M. Sabu *et* Sunojkumar *sp. nov.* (Fig. 1)

Similar to *S. densiflora* but differs from it in having a 10 ribbed calyx, glandular hairs on calyx and corolla tube, and obovate-round petals.

Type:—INDIA. Tamil Nadu: Coimbatore district, Bharathiar University Campus, ±450 m, 10 August 2011, *K. M. Prabhu Kumar CU88154* (holotype CALI!; isotype MH!, CALI!).

Perennial, erect chlorophyllous plant, 20–35 cm tall. Stem densely hispid, green. Leaves green, linear with acute apex, opposite to alternate, sessile, appressed to the stem, hispid on abaxial and adaxial sides, 16–20 × 1–3 mm. Bract one, longer than the calyx, ovate-linear, acute at apex, 6–6.5 × ca. 1 mm, hispid on both sides. Bracteoles 2, equal, lanceolate, shorter than the calyx lobes, hispid at both sides, 4–5 mm long. Flowers opposite or alternate, sessile 11–12 mm long, white. Calyx 10-ribbed; lobes 5, 5–5.2 mm long, one rib in between the lobes and ending in the sinuses, equal, calyx teeth linear, hispid on upper surface, lower part glabrous. Corolla tube tubular, fully covered with glandular hairs, inner region of the tube densely pubescent, 8.5–9 mm long, 1/2 portion enclosed by the bracts; lobes obovate-round, white, slightly recurved, lower lip tripartite; upper lip bilobed, 2.2–2.4 × 2.2–2.5 mm. Stamens 4, attached to distal end of the tube, just below the throat. Ovary 2 mm long, glabrous; style long, up to 7 mm long, glabrous, a brown colour at the tip. Capsule oblong, 3–4 mm long, acute at apex, shorter than the calyx (Fig. 1).

Flowering & Fruiting:— June–February.

Etymology:—The new species is named in honour of Professor Kamal Mohamed, State University of New York Oswego, Oswego, New York, who revised the genus *Striga* in Africa and also for his valuable contribution to the field of Plant Taxonomy.

Habitat & Ecology:—The University is situated at the foothills of Maruthamalai, a mountain that forms part of the Western Ghats Range, in a sprawling campus of 1000 acres, 12 km away from the city of Coimbatore. The area has a predominant red soil impregnated with organic matter and granite bedrock is overlaid with shallow, sandy loam and glacial soils are moderately to well drained. The environment is mixed dry deciduous type of plain area at an altitude of 250–450 MSL, 11.04°E of longitude and 76.93°N latitude. Temperature begins increasing after March and April is the hottest month with a near daily maximum temperature of 38.2°C and maximum of 25–6°C (Sarvalingam *et al.* 2013).

Distribution:—The type locality of the new taxon is the disturbed grass land in the Bharathiar University Campus, Coimbatore. Except this locality the authors observed few more population in the same campus in a distance of 2 km from the type locality.

Parasitism:—The new species is parasitic on the roots of *Apluda mutica* Linnaeus (1753: 82) and *Aristida adscensionis* Linnaeus (1753: 82).

Taxonomic Affinity:—*Striga kamalii* *sp. nov.* shows similarity with *S. densiflora* Benth. in having densely hispid stem, linear leaves, longer bracts than calyx, oblong fruit shorter than calyx lobes, but differs in 10 ribbed calyx, glandular hairs on calyx and corolla tube, obovate-round petals.

Conservation Status:—The new species is rare at the locality. Collected only from four different areas, the extent of occurrence is estimated to be less than 10 km². So far, in all these habitats we could locate only a few populations with ca. 100 individuals, that too prone to destruction in the near future due to various human activities. The status is assessed here as Data Deficient (DD) pending further study. Emergency conservation methods are recommended (IUCN, 2010).

Additional specimens examined (paratypes):—INDIA. Tamil Nadu: Coimbatore district, Bharathiar University Campus, 10 August 2011, *K. M. Prabhu Kumar 88154*; 11 August 2012, *K. M. Prabhu Kumar & M. Omalsree 88161*; Foot hills of Maruthamali hills, 19 August 2013, *K. M. Prabhu Kumar & M. Omalsree 95816* (CALI!).

Key to the *Striga* spp. distributed in South India

1. Calyx 4–5 ribbed2
- Calyx 10–15 ribbed5
2. Leaves scale like; parasitic on dicots.....3
- Leaves linear; parasitic on monocots *S. densiflora*
3. Stem greenish yellow, round, flowers creamy white, bracts as long as or smaller than the calyx, corolla tube 5–7 mm long.....

-	Stem purple, terete to quadrangular, flowers pink, bracts longer than the calyx, corolla tube 8–14 mm long.....	4	<i>S. indica</i>
4.	Leaves minutely puberulent to almost glabrous, bracts puberulous, upper lobes of corolla indistinctly bi-lobed or emarginate	6	<i>S. gesnerioides</i>
-	Leaves densely appressed strigose hairy, bracts densely strigose, upper lobes of corolla clearly 2-lobed	6	<i>S. scottiana</i>
5.	Calyx 10-ribbed.....	6	<i>S. angustifolia</i>
-	Calyx 15-ribbed.....	6	<i>S. asiatica</i>
6.	Corolla lobes obovate, calyx and corolla tube pubescent, tube 11–14 mm long, petals yellow, white or red	6	<i>S. kamalii</i>
-	Corolla lobes obovate-round, calyx and corolla tube glandular hairy, tube 8.5–9 mm long, petals white	6	<i>S. kamalii</i>

TABLE 1. Diagnostic morphological comparison of *Striga kamalii* with *S. densiflora*

<i>Characters</i>	<i>S. densiflora</i>	<i>Striga kamalii</i>
Stem	Scabrid or strigose	Densely hispid
Bracts	Linear, hairy	Ovate-linear, hispid on both sides
Flower	Densely arranged on inflorescence	Not densely arranged
Bracteoles	Linear, hairy	Lanceolate, densely hispid
Calyx	Strongly 5-ribbed, lobes sub equal, teeth lanceolatesubulate, hairy, ciliate	Strongly 10-ribbed; lobes equal, teeth linear, hispid on upper surface, lower part glabrous
Corolla	Lobes orbicular, obtuse, hairy	Lobes obovate-round, fully covered with glandular hairs

Acknowledgements

The authors are thankful to Professor Kamal Mohamed, State University of New York Oswego, Oswego, New York for his valuable comments and suggestions on the identity of this new taxon. Thanks also due to Mr. VS Hareesh for his excellent illustrations.

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