



A new species of *Ardisia* (Primulaceae) from the Anamalai Hills of Western Ghats, India

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Abstract: *Ardisia ramaswamii* (Primulaceae) is described as a new species from the Anamalai hills of Western Ghats, India. On account of the presence of axillary and extra axillary umbellate cymes with peduncles shorter than the foliage and longer than petiole, slender pedicels, non-overlapping calyx lobes etc., the species is included under the subgenus *Akosmos* following Mez (1902). Detailed description, illustrations, colour photographs, phenology, distribution details and significant ecological notes are provided along a comparison with its closely related species, *A. pauciflora* Heyne ex Roxb.

Keywords: New species; *Ardisia*; *Akosmos*; Primulaceae; Anamalai Hills; Western Ghats; India.

Introduction

Ardisia Swartz (Primulaceae) is a pantropical genus with more than 500 species of shrubs and trees (Chen & Pipoly, 1996), spread throughout the warmer regions of Africa, Madagascar, the Americas, Asia and Australasia (Strijk *et al.*, 2013). The genus is represented with more than 400 species in Asia (Hu, 1999; Mao & Hu, 2013). In India, the genus is represented by 28 species including eight species endemic to the Western Ghats region (Nazarudeen *et al.*, 2018; Rajkumar *et al.*, 2017, 2015; Nayar *et al.*, 2014; Barbhuiya *et al.*, 2012; Viswanathan *et al.*, 2002; Nayar, 1996; Sasidharan & Sivarajan, 1994). Some of the species are extremely rare due to their habitat specificity and paucity of occurrence.

Fischer (1921), on the authority of M. S. Ramaswami had mentioned the occurrence of a presumably new species closely allied to *Ardisia pauciflora* Heyne ex Roxb. in the Iyerpadi forests of Anamalai Hills. While conducting botanical explorations as part of the survey and documentation of the floristic wealth of Western Ghats, the authors came across with an

interesting specimen of *Ardisia* from the Anamalai Hills particularly from the evergreen forests of Akkamalai at an altitude 1768 m (Map 1) which is a continuum of the Iyerpadi forests coming under the Anamalai Tiger Reserve of the State of Tamil Nadu. Detailed taxonomic analysis of the specimen has proved to be identical with the doubtful species recorded by M. S. Ramaswami, hence proposed as a new species, described and illustrated.

On account of the axillary and extra axillary umbellate cymes, short peduncles slightly shorter than the foliage and style shortly protruding above anthers, the new species falls under the subgenus *Akosmos* as per criteria set by Mez (1902), just like *Ardisia blatteri* Gamble, *A. depressa* C. B. Clarke, *A. pauciflora* Heyne ex Roxb. *A. rhomboidea* Wight and *A. agasthyamalayana* Nazarudeen *et al.* A simplified taxonomic key is provided to distinguish the species from the allied relatives. Including the proposed species, the number of *Ardisia* species in India comes to 29.

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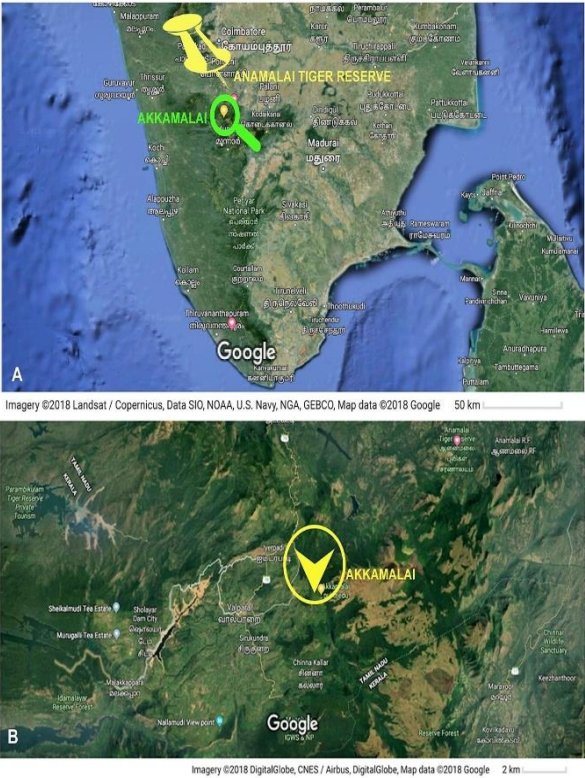
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Taxonomic treatment

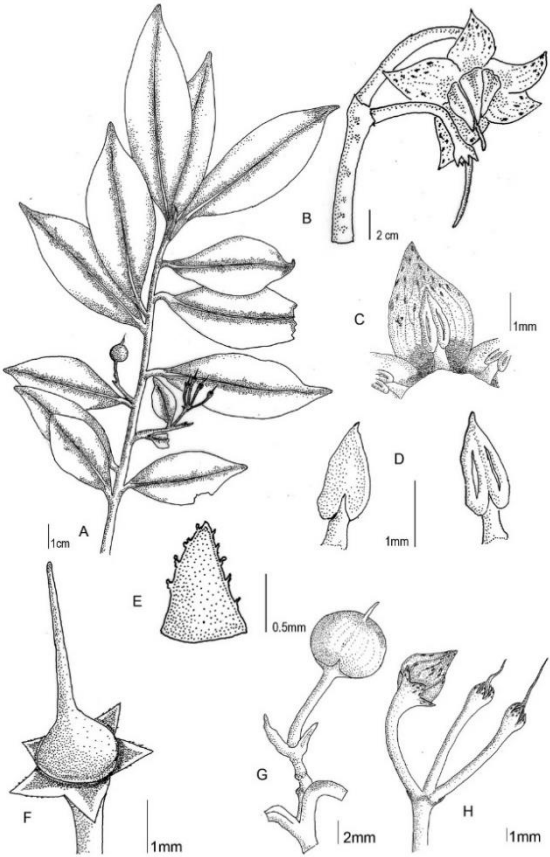
Ardisia ramaswamii Nazarudeen, Rajkumar & Prakashkumar sp. nov. (Fig. 1 & 2; Table 1).

Map 1. *Ardisia ramaswamii* Nazarudeen, Rajkumar & Prakashkumar sp. nov. - Location map;



A - Southern part of India, locating Anamalai Tiger Reserve and Akkamalai, B - Akkamalai forests.

Figure 1. *Ardisia ramaswamii* Nazarudeen, Rajkumar & Prakashkumar sp. nov.

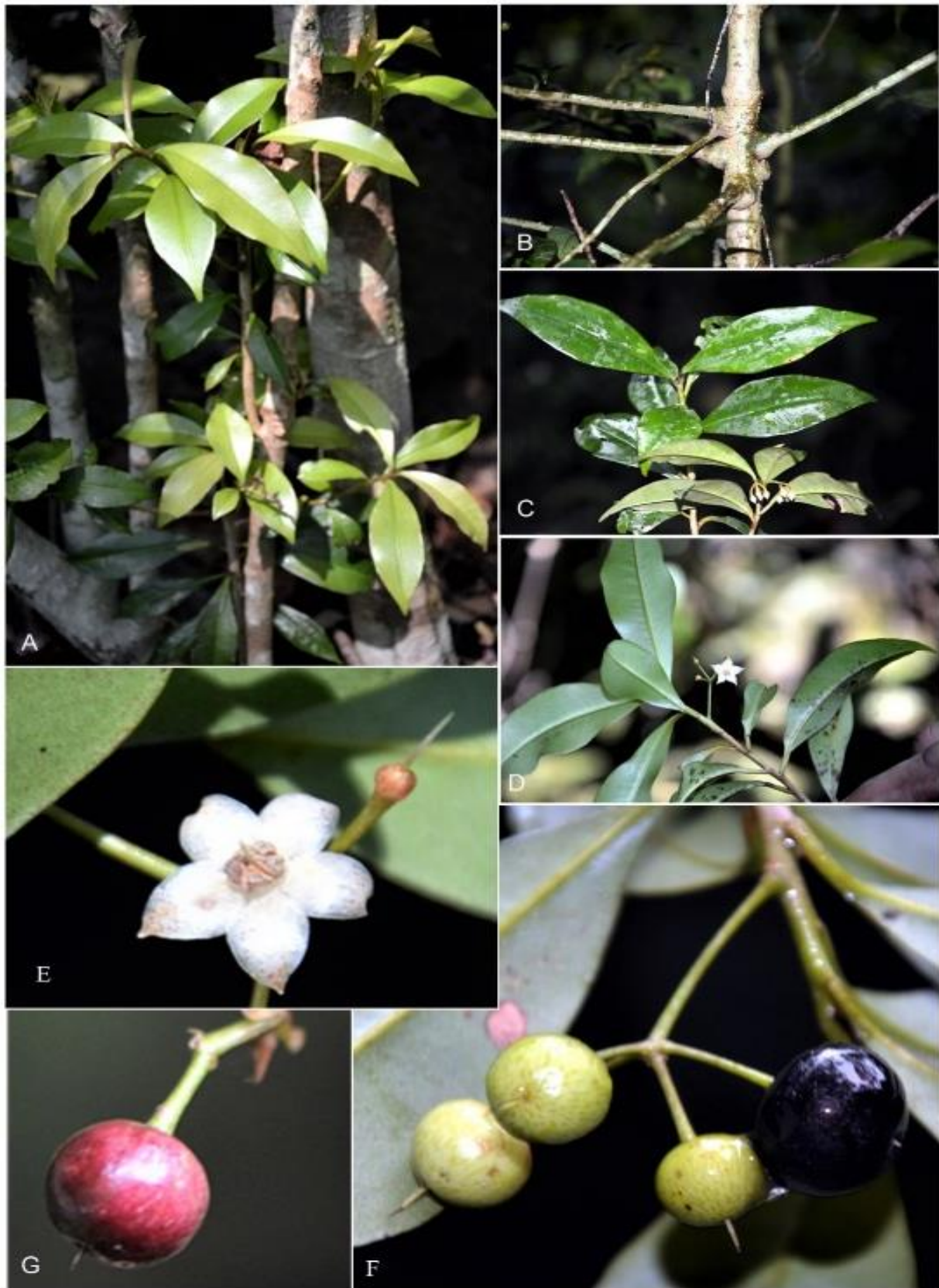


A - Flowering twig, B - Flower, C - Portion of corolla split open, D - Anther (dorsal & ventral sides), E - Calyx lobe, F - Pistil, with calyx & pedicel, G - Fruit, H - Flower bud

Table 1. Comparison of *Ardisia ramaswamii* sp. nov. with *A. pauciflora* Heyne ex Roxb.

Characters	<i>A. ramaswamii</i> sp. nov.	<i>A. pauciflora</i>
Habit	Up to 5 m tall	Up to 11 m tall,
Branches	Nearly horizontal	Slightly ascending
Leaves	Elliptic	oblong lanceolate
Leaf size	2.5-9 × 1.2-3 cm	8-16 × 3-5 cm
Leaf texture	Subcoriaceous, closely punctate	Chartaceous, less punctate
Leaf margins	Entire	Entire but surface undulate
Leaf tip	Acute to shortly acuminate	Long acuminate
Leaf base	Cuneate to attenuate	Tapering
Inflorescence	Compact with more flowers towards tip	Less flowers towards tip
Flower colour	Pinkish white	Creamy white
Corolla lobes	Broad, thick and abruptly pointed with orange yellow mosaic blotches, blotches more on the outer side	Narrow, thin and long pointed, slightly translucent, lobe narrow, blotches few
Fruit	Globose, 0.5-0.6 cm diam.	Globose, 1-1.5 cm diam.

Figure 2. *Ardisia ramaswamii* Nazarudeen, Rajkumar & Prakashkumar sp. nov.



A - Habit, B - Branching pattern, C - Twig with flower buds, D - Flowering twig, E - Single flower, F - Green mature and fully ripe fruits, G - Half ripe fruit.

Figure 3. *Ardisia pauciflora* Heyne ex Roxb.**A - Habit, B - Fruiting branch, C - Flower.**

Ardisia ramaswamii shares certain characters similar to *A. pauciflora* Heyne ex Roxb. but distinct with some morphological features necessitating it to recognize as a new species *Ardisia ramaswamii* can be easily recognized by its comparatively smaller elliptic leaves with non-wavy margins, pinkish white flowers with orange yellow blotches on the inner side of the corolla and comparatively smaller fruits.

Type: INDIA. Tamil Nadu: Coimbatore district, Anamalai Tiger Reserve, Akkamalai, ± 1768 m, 28.11.2018, A. Nazarudeen & G. Rajkumar 93921 (Holotype, TBGT; Isotype, MH).

Small tree, ± 5 m tall, branchlets hardly pubescent, tips of branchlets rusty scaly. Leaves elliptic-lanceolate, $2.5-9 \times 1.2-3$ cm, subcoriaceous, glabrous, black punctate, base attenuate, apex shortly caudate with a blunt tip, margin entire,

lateral veins obscure, midrib prominent below; petiole 0.5-0.7 cm long. Inflorescence umbellate cyme, 3-5 flowered axillary and extra axillary. Flowers 1-1.3 cm across; peduncles slender, 1-1.5 cm long; pedicels slender, 1.3-1.6 cm long, glabrous; bracts small; calyx lobes triangular, subacute, punctate, not overlapping, $1-1.5 \times 0.75-1$ mm, with ciliate or lacinate margins, cilia hyaline; corolla lobes 5, twisted to right in bud, basally joined, tip acute, c. 5×3 mm, 3-6 nerved, nerves clear on the dried specimens, deflexed, light pink to pinkish white punctate, with orange yellow mosaic blotches, more towards tip; stamens 5, opposite to petals, 0.25-0.3 cm long, filaments short but broader, 0.05 cm long, attached on the corolla at the base, anthers 0.3-0.35 cm long, 0.1- 0.13 cm broad, sagitate, ditheous, dehiscence longitudinal, introrse; ovary globose, glabrous, 0.1-0.15 cm long, equally broad, style cylindric, tapering, 0.2-0.25 cm long. Fruits depressed globose, 0.5-0.6 cm diam., smooth, glossy, with persistent style, fruit style 0.3-0.4 cm long, fruits light green, glabrous, smooth, ripening red to black. Seed single, 0.5-0.6 cm diam., globose, testa thin.

Flowering and Fruiting: October – January

Etymology: The species is named after Mr. M. S. Ramaswami, one of the leading botanists of the early 20th century who along with C.C. Calder and V. Narayanaswami had listed species and genera of Indian Phanerogams left unlisted in Sir J. D. Hooker's Flora of British India.

Ecology and Distribution: Known only from the type locality, Akkamalai hills of Anamalai Tiger Reserve, Coimbatore District, Tamil Nadu, India. Dispersed in the closed ever-green forests at an altitude above 1700 m., in association with *Ardisia pauciflora* Heyne ex Roxb., *A. rhomboidea* Wight, *Antistrophe serratifolia* (Bedd.) Hook. f., *Psychotria anamallayana* Bedd., *Micrococca beddomei* (Hook. f.) Prain, *Rauvolfia vertici-*

llata (Lour.) Baill., *Strobilanthes anamallaica* J. R. I. Wood, *Litsea deccanensis* Gamble, *Antidesma montanum* Blume, *Miliusa montana* Gardner ex Hook. f. & Thoms., *Lasianthus rostratus* Wight, *Salacia fruticosa* Wall., *Cullenia exarillata* A. Robyns., *Meiogyne pannosa* (Dalzell) J. Sinclair etc.

Conservation status: This species has been recorded only from the type locality and repeated surveys could locate only less than 25 mature individuals and that too are found growing scattered in less than a 10 km² area with severely fragmented population. On the basis of the present study it is concluded that the species qualify itself to be included in the Critically Endangered (CR) category as per IUCN Red List Categories and Criteria, version 3.1, B2a and D of IUCN (2014). The species needs special conservation measures due to possible degradation of the habitat (version 3.1, B2b).

Notes: *Ardisia ramaswamii* exhibits a very low population, restricted and localized in the type locality and further, the very existence of the species is in danger due to high degree of anthropogenic disturbances as the area borders tea plantations. It is on the authority of M. S. Ramaswami that Fischer (1921) in his 'Flora of the Anamalai Hills', mentioned the occurrence of this taxon in the evergreen forests of Iyerpadi at about 4000' elevation. It was Ramaswami who for the first time had noticed the species (but not published) in the Iyerpadi forests of Anamalai Hills and had related the species close to *Ardisia pauciflora* Heyne ex Roxb. (Fig.3). He referred his collection (Coll. No. 3299) to Kew (*n.v.*) for confirming identity but unfortunately nothing was materialized further and, Ramaswami could not follow much till his demise. As a mark of respect, the present species is named after Ramaswami who made remarkable contributions to the floristic studies of Tamil Nadu in the early 20th century.

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