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RESEARCH ARTICLE

***Cinnamomum agasthyamalyanum* sp. nov. (Lauraceae) from Kerala, India**

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Abstract

Cinnamomum agasthyamalyanum Robi, Sujanapal & Udayan a new species of *Cinnamomum* Schaeff. from Kollam and Thiruvananthapuram district in Kerala, India is described and illustrated. The new species resembles with *Cinnamomum dubium* Nees in its leaves and inflorescence, but differs in having inner bark and leaves with strong odor of camphor, chartaceous to thinly coriaceous glabrous leaves with acute or cuneate base; 5–10 cm long inflorescence and inner whorl of stamens with 2-locular anther lobes.

Introduction

The genus *Cinnamomum* Schaeff. was established by Schaeffer (1760) based on *Cinnamomum verum* J. Presl from Ceylon. As currently estimated, *Cinnamomum* contains about 200–350 species (Rohwer, 1993), most of them in the Old World tropics, mainly in southeastern Asia. Kostermans revised the genus in southern India, Australia, and the islands of the Pacific region (Kostermans, 1983, 1986 & 1995). The genus is not represented from Africa. In India, a total of 40 species are distributed mainly in the Western Ghats and adjoining areas, the Andaman Islands and the eastern Himalayas (Barua & Nath, 2008; Remya *et al.*, 2014). A total of 18 species are recorded from southern India, out of which 16 are endemic to this region (Geetha Kumary *et al.*, 2007). The genus is distinguished from the other genera of Lauraceae by its strong aromatic bark, opposite or occasionally alternate, tripli-nerved or pinnately nerved leaves with bisexual flowers, panicles axillary or sub-terminal inflorescence, 9 perfect stamens, 4- or 2-locular anthers, fruits inserted on the expanded slightly or scarcely enlarged cupular or 6-lobed perianth tube, tepals deciduous from the base or from the middle. Several species are cultivated commercially for cinnamon, cassia, and camphor (Nirmal Babu *et al.* 2003). In course of revision of the family Lauraceae from South India, the authors encountered an interesting specimen of *Cinnamomum* from Agasthyamala and Rosemala, Kerala, which resembled that of *Cinnamomum dubium* Nees by the habit and leaves. However, critical studies of the plant material revealed that the species is different from latter, especially in its camphor smell of inner bark and leaves, glabrous leaves with acute base, sparsely sericeous flowers, inner whorl of stamens with 2-locular anther lobes. A detailed description and illustration are provided here to facilitate its identification in the field.

***Cinnamomum agasthyamalyanum* Robi, Sujanapal, Udayan sp.nov.** (Figure 1; Plate 1).

The new species is closely similar to *Cinnamomum dubium*, but differs in having inner bark and leaves with the strong odor of camphor; glabrous branchlets; chartaceous to thinly coriaceous, glabrous leaves with acute or cuneate base; sparsely minutely appressed sericeous flowers; 5–10 cm long inflorescence and inner whorl of stamens with 2-locular anther lobes (Table 1).

Type:—INDIA, Kerala, Thiruvananthapuram dist.: Agasthyamala, ±850 m, 22 February 2012, A.J. Robi & P. Sujanapal 23350 (Holotype: MH; Isotypes: KFRI, CMPR, CALI).

Trees to 8 m tall; bark smooth or somewhat rough; inner bark light to dark brown with strong odor of camphor; branchlets slender, smooth, terete, glabrous; terminal buds not perulate, small, densely sericeous. Leaves simple, opposite or sub-opposite, estipulate, tri-nerved; petioles *ca.* 1 cm long, slender, shallowly grooved above, glabrous; lamina 7–14×2–5 cm lanceolate to elliptic-lanceolate, base acute, apex attenuate or sub-acuminate, glabrous, glaucous below, smooth and glossy above, chartaceous to thinly coriaceous; midrib slightly raised above, prominent below; lateral veins 2, paired, opposite or sub-opposite, *ca.* 1 cm, sub-basal and terminate near the tip of lamina, filiform and glabrous on both sides; major intercostal veins scalariform, prominent abaxially; minor intercostal veins finely reticulate, prominent abaxially and faint adaxially. Inflorescences sub-terminal, cymose-panicle, 5–10 cm long, slender, few flowered; peduncles slender, sparsely sericeous. Flowers greenish-yellow, sparsely minutely appressed sericeous; pedicels *ca.* 7 mm long, slender, greenish-yellow, sparsely sericeous; tepals 6 in 2 whorls of 3 each, equal, 3×1.5 mm, ovate or elliptic, acute or obtuse at apex, thick, minutely appressed sericeous outside, densely tomentellous inside, caducous, greenish-yellow, margin ciliate; stamens 9 in 3 whorls of 3 each, *ca.* 3 mm long; outer whorl 3, anthers ovate or sub-rectangular, base slightly chordate, apex obtuse, 4-locular, fleshy, introrse; filaments *ca.* 1 mm long, minutely pilose, eglandular; middle whorl almost same as the outer; inner whorl 3, anthers ovate, obtuse with 2-locular, latrorse; filaments with 2-glands attached near the basal portion; sessile glands, ovate-oblong, obtuse at apex, pilose; staminodes 3, *ca.* 1 mm long, semi-sagittate, shortly stipitate, sparsely pilose; ovary *ca.* 2 mm long, obovoid, glabrous; style 1.5 mm long, glabrous, stigma small, peltate.

Flowering & Fruiting:— January–May.

Distribution:— Endemic to Southern Western Ghats (Kerala: Rosemala of Kollam district and Agasthyamala of Thiruvananthapuram district).

Ecology:— It is growing in dense wet evergreen forests at an altitudinal range 500–1400 m.

Etymology:—The specific epithet “*agasthyamalayanum*” is named after the type locality Agasthyamala hills.

Relationships:— The species shows similarities with *C. capparucoronade* Thwaites due to camphor smell in bark and leaves; venation and inflorescence and also resembles with *Cinnamomum dubium* in its leaves and inflorescence. But, *C. agasthyamalayanum* is characterized by the chartaceous to thinly coriaceous, glabrous leaves; sparsely pubescent flowers; 5–10 cm long inflorescence and inner whorl of stamens with 2-locular anther lobes.

Conservation status:—The new taxon is distributed in the windward evergreen forests of Agasthyamalai phytogeographical region of southern Western Ghats. In almost all the localities the population is very low. The main distribution range is Attayar to Chemungi. Isolated population is observed in Rosemala area also.

Notes:— According to the current knowledge, there are only two species with camphor smell *viz.*, *C. camphora* (L.) Presl, and *C. capparucoronade*. The preceding one is widely cultivated and the latter is restricted to the forests of Sri Lanka. The new species is economically important, since it is the only native species with strong smell of camphor, probably due to the high content of volatile oil.

Additional specimens examined (Paratypes):— INDIA, Kerala, Kollam dist.: Rosemala, ±650 m, 11 February 2008, P.S. Udayan *et al.* 4672 (CMPR!); Thiruvananthapuram dist.: Attayar, ±800 m, 21 September 2011, A.J. Robi 26541 (KFRI!).

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Table 1. Comparison between *C. dubium* and *C. agasthyamalyanum*

Characters	<i>C. dubium</i>	<i>C. agasthyamalyanum</i>
Habit	Trees, to 12 m tall	Small trees, to 8 m tall
Bark	Red-brown, slimy, odorless or slightly mango-scented	Pale brown, with strong smell of camphor
Branchlets	Grey-tomentellous	Glabrous
Leaves	Rigidly coriaceous, minutely appressed pubescent below, base rounded or obtuse	Chartaceous to thinly coriaceous, glabrous below, base acute or cuneate
Inflorescence	Panicles 2–7 cm long, pilose	Panicles 5–10 cm long, glabrous
Flowers	Densely sericeous	Sparsely sericeous
Stamens	Inner whorl three with 4-locular anther lobes.	Inner whorl three with 2-locular anther lobes.



Plate 01. *Cinnamomum agasthyamalyanum* Robi, Sujanalpal & Udayan *sp.nov.* A. Habit; B. Bark & inner bark; C. Leaves-abaxial view; D. Leaves-adaxial view; E. Inflorescence; F. Flower-enlarged

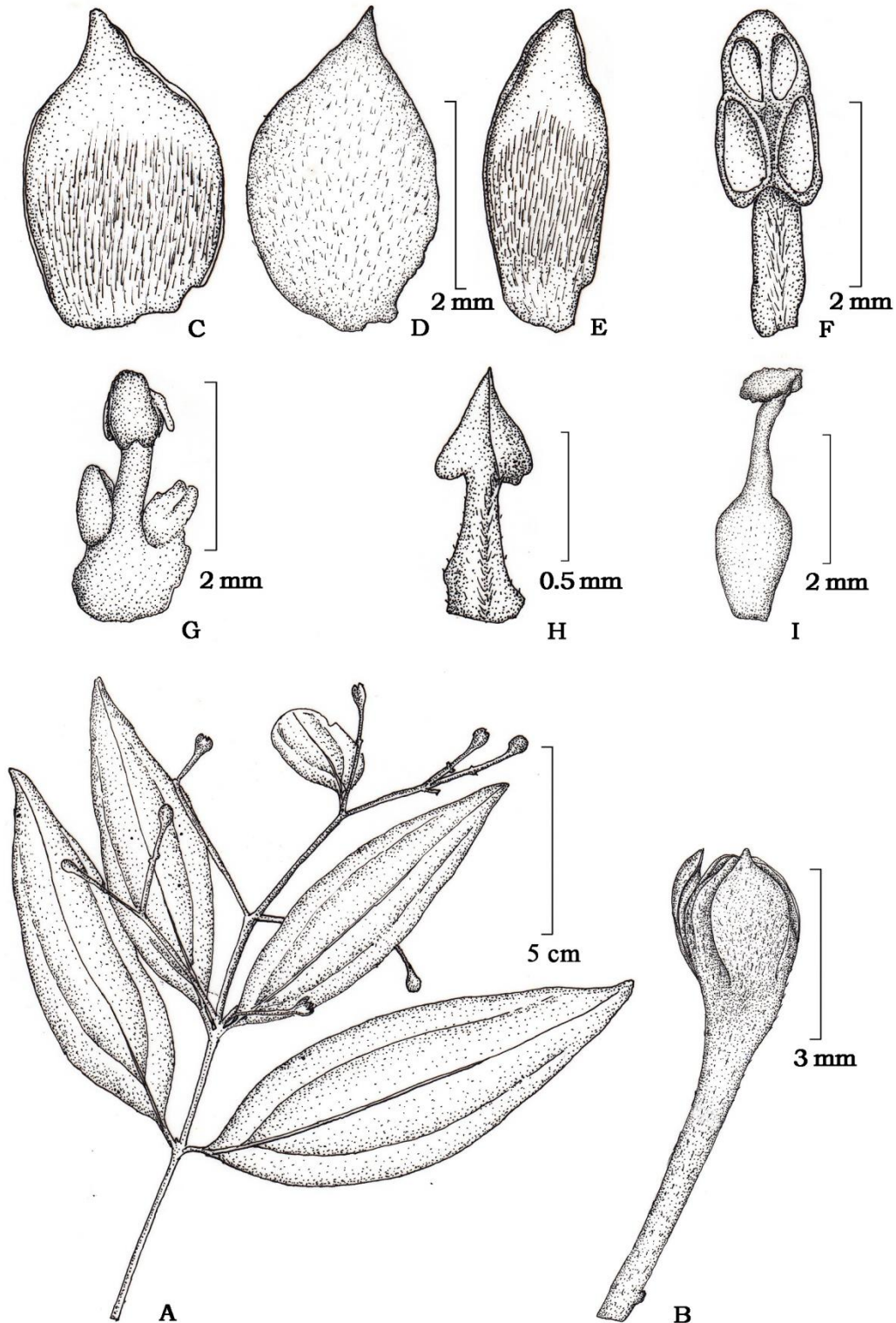


Figure 1. *Cinnamomum agasthyamalanum* Robi, Sujanapal, Udayan *sp. nov.* A. Habit; B. Flower; C. & D. Tepals inside and outside view; E. Inner tepal; F. Stamen without glands; G. Stamen with glands; H. Staminode; I. Pistil

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