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Research article

CANSCORA BHATIANA (GENTIANACEAE), A NEW SPECIES FROM KERALA, INDIA

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ABSTRACT: A new species of *Canscora*, *C. bhatiana* K. S. Prasad & K. Ravi, is described from the lateritic hillocks of Kasaragod District, Kerala. It differs from the allied *C. devendrae* R. Kr. Singh and Diwakar in clear dichotomous apical branching, winged stem, farinaceous leaves, much reduced upper cauline leaves, pedicellate flowers, lanceolate bracts, two times longer filaments and much shorter ovary.
Key words: Gentianaceae, *Canscora bhatiana*, India, Kerala, New species

INTRODUCTION

The genus *Canscora* Lam. of the tribe Canscorinae is represented by 9 species in tropical Asia, Africa and Australia, of which 7 species are reported from India with the endemic *C. perfoliata* Lam. [1]. Thiv [1] in his revisionary work treated the narrow endemic *C. stricta* Sedgw. as doubtful species and was later rediscovered from Dakshina Kannada District [2] and Mookambika Wildlife Sanctuary [3] of Karnataka. Further floristic exploration of the biodiversity rich Mookambika Wildlife Sanctuary in the later years resulted in two more new species namely *C. sanjappae* Diwakar & R. Kr. Singh [4] and *C. devendrae* R. Kr. Singh and Diwakar [5].

While carrying out extensive floristic survey of lateritic hillocks of Northern Kerala, the authors collected an interesting species of *Canscora* Lam. On critical analysis and perusal of literature, it was confirmed as new species and is described here.

Canscora bhatiana K. S. Prasad & K. Ravi sp. Nov. (Fig. 1 & 2)

Type. India. Kerala, Kasaragod district, Seethangoli, 12^0 35' 20'' N & 75^0 0' 8'' E, 100 m alt., 28 August 2010, K. S. Prasad 02552 (Holotype: CAL. Isotypes: MH, CALI, MBGS).

Annual erect herbs, 12 – 24 cm long; stem quadrangular, distinctly winged; wings ca. 1 mm wide, branched dichotomously; branches quadrangular, winged. Lower cauline leaves sessile, opposite decussate, 9 – 13 × 3 – 8 mm, subcoriaceous, ovate-lanceolate, 3-nerved, farinaceous, attenuate to obtuse at base, apex acute; upper cauline leaves much reduced, sessile, 3 – 5 × 0.8 – 1.2 mm, lanceolate, broad at base, apex acute. Inflorescence terminal compound dichasial cymes; cymules 1 – 4-flowered. Flowers tetramerous, pedicellate; pedicels 8 – 15 mm long; bracts foliaceous, 2 – 3 × 0.4 – 0.6 mm, lanceolate, acute at apex. Calyx-tube membranous, 4 – 6 mm long, 5-ribbed, brownish, wings absent; lobes 4, 1.5 – 2 mm long, lanceolate, acute at apex. Corolla actinomorphic, pink; tube 3 – 4 mm long, greenish-white inside; lobes 4, all equal in size and shape, 4 – 5 × 2 – 2.5 mm, ovate. Stamens 4, all equal in size and shape, persistent; filaments pink, 3 – 4 mm long, inserted at the throat of the corolla-tube; anthers 0.8 – 0.9 mm long, dorsifixed, orange-yellow, unequal at base. Ovary oblong, 3 – 3.5 × 0.8 – 1 mm, green; style 2.5 – 3 mm long, pink; stigma bilobed, lobes 0.2 – 0.3 mm long, obovate, white. Capsules oblong, 4 – 6 × 1 – 2 mm, with persistent calyx and stamens. Seeds irregular in shape, cubical to rectangular with shallowly sunken sides, 0.2 – 0.3 × 0.15 – 0.25 mm, brown.

Diagnosis

Canscora bhatiana K. S. Prasad & K. Ravi is closely allied to *C. devendrae* R. Kr. Singh and Diwakar but differs in having dichotomous apical branching, winged stem and branches, farinaceous leaves, much reduction of upper cauline leaves, pedicellate flowers, lanceolate bracts and two times longer filaments. Eventhough it shares some resemblance with both *C. diffusa* (Vahl.) R. Br. and *C. sanjappae* Diwakar & R. Kr. Singh but differs in many features. A more detailed morphological comparison of these four species is given in Table 1 and Fig. 2. From phyletic evolutionary point of view, it seems that this taxon with actinomorphic flowers may be the connecting link between genera *Canscora* Lam., *Cracosna* Gagnep., *Hoppea* Wild. and *Schinziella* Gilg.

Distribution, habitat and ecology

Canscora bhatiana is restricted in distribution to the lateritic hills of Northern Kerala in Peninsular India. The plant grows on exposed lateritic rocks at an altitude of 75 – 150 msl. Flowering and fruiting occurs during August – October. It is found growing in association with *Neanotis hohenackeri* Daniel & Vajr., *Canscora diffusa* (Vahl.) R. Br., *Eriocaulon eurypeplon* Koernicke, *Justicia nagpurensis* Graham, *Hedyotis cyanantha* Kurz., *Polygala elongata* Klein ex Willd., *Cyanotis papilionacea* (Burm. f.) Schult. and *Polycarpaea corymbosa* (L.) Lam.

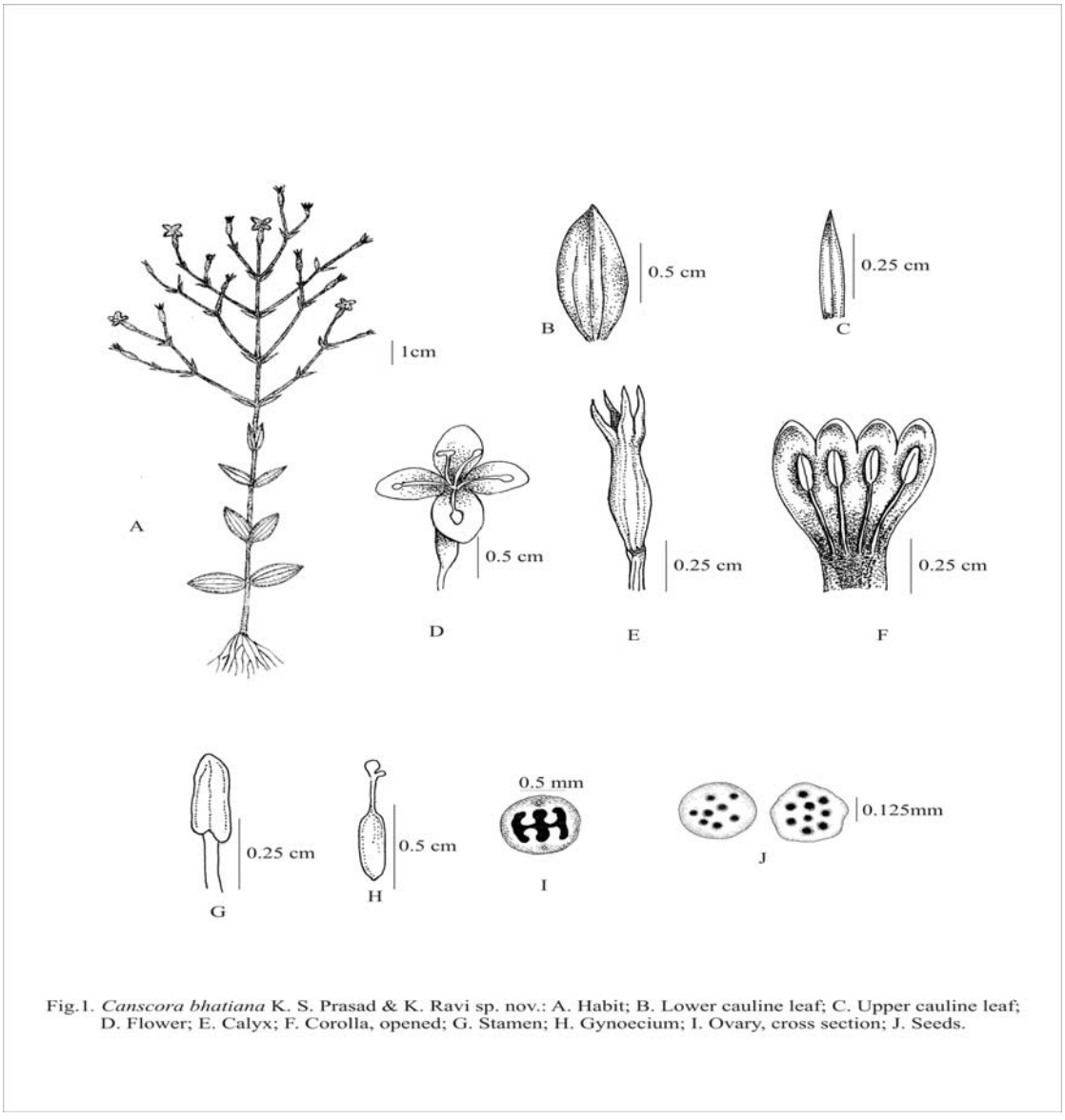

Fig.1. *Canscora bhatiana* K. S. Prasad & K. Ravi sp. nov.: A. Habit; B. Lower cauline leaf; C. Upper cauline leaf; D. Flower; E. Calyx; F. Corolla, opened; G. Stamen; H. Gynoecium; I. Ovary, cross section; J. Seeds.

Etymology

The new species is named after Prof. K. Gopalakrishna Bhat, Department of Botany, Poornaprajna College, Udupi for his contributions in the field of taxonomy and floristics.

Additional specimens examined

India, Kerala, Kasaragod District, Darmathadka, 12^0 39' 46'' N & 75^0 1' 50'' E, 150 m alt., 12 September 2011, 02852 K. S. Prasad; Kallakatta, 12^0 32' 36'' N & 75^0 2' 12'' E, 100 m alt., 21 August 2012, 03098 K. S. Prasad; Bapalipponam, 12^0 37' 30'' N & 75^0 2' 30'' E, 125 m alt., 25 August 2012, 03100 K. S. Prasad; Ukkinadka, 12^0 37' 23'' N & 75^0 5' 25'' E, 150 m alt., 4 September 2012, 03115 K. S. Prasad.

Conservation status

Many anthropogenic activities like conversion for building sites, mining, dumping of wastes, uncontrolled tourism and grazing are the major threats to the lateritic hillocks and in turn to the survival of many narrow endemic species. Hence, there is an urgent need to conserve these fragile ecosystems.

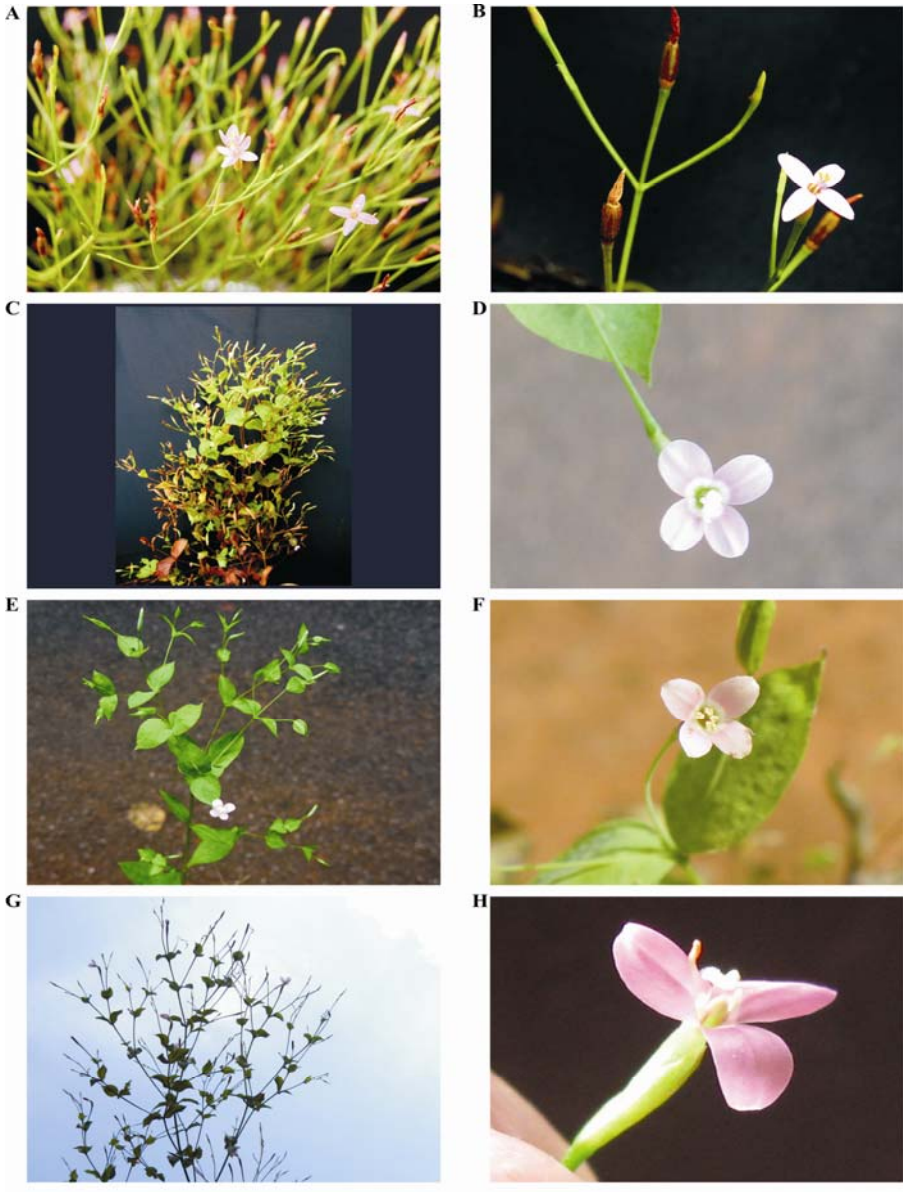

Fig. 2. Habit and flower: A, B - *Canscora bhatiana*; C, D - *C. devendrae*; E, F - *C. sanjappae*; G, H - *C. diffusa*.

Table 1. Comparison of *Canscora diffusa, C. sanjappae, C. devendrae* and *C. bhatiana*

Characters	*C. diffusa*	*C. sanjappae*	*C. devendrae*	*C bhatiana*
Stem	Profusely branched; quadrangular, wings upto 0.3 mm wide; 6 – 48 cm high	Apically branched; obscurely quadrangular, not winged; 8 – 25 cm high	Profusely branched; quadrangular, not winged; 8 – 25 cm high	Apically branched; quadrangular, wings upto 0.1 mm wide; 12 – 24 cm high
Branching	Irregular	Irregular	Irregular	Clearly dichotomous
Leaves	Lower cauline leaves deciduous; leaves coriaceous, glabrous; upper cauline leaves petiolate, elliptic-lanceolate, 12 – 39 × 7 – 27 mm, base attenuate to wedge-shaped, apex acute	Both lower and upper cauline leaves distinct; leaves membranous, glabrous; lower cauline leaves petiolate, elliptic or ovate, 14 – 26 × 5 – 15 mm, base attenuate, apex acute; upper cauline leaves sessile, broadly ovate, 7 – 14 × 4 – 11 mm, base rounded, apex acute	Both lower and upper cauline leaves distinct; leaves coriaceous, scaberulous; lower cauline leaves sessile, ovate, 15 – 21 × 4 – 6 mm, base obtuse, apex acute; upeer cauline leaves sessile, lanceolate, 5 – 14 × 2 – 3 mm, base attenuate, apex pointed	Upper cauline leaves highly reduced; leaves sub-coriaceous, farinaceous; lower cauline leaves sessile, ovate-lanceolate, 9 – 13 × 3 – 8 mm, base attenuate to obtuse, apex acute; upper cauline leaves sessile, lanceolate, 3 – 5 × 0.8 – 1.2 mm , base attenuate, apex acute
Inflorescence	Lax diffuse paniculate cymes	Compound dichasial cymes	Compound dichasial cymes	Compound dichasial cymes
Flowers	Pedicellate; pedicels 1.5 – 15 mm long	Pedicellate; pedicels 5 – 10 mm long	Only terminal flowers pedicellate; pedicels 5 – 10 mm long	Pedicellate; pedicels 8 – 15 mm long
Bracts	Broadly ovate, 1 – 4 × 0.1 – 1.2 mm	Ovate, 3 – 6 x 2 – 3 mm	Linear, 4 – 6 × 2 – 3 mm	Lanceolate, 2 – 3 × 0.4 – 0.6 mm
Calyx tube	2.9 – 6.5 mm long	5 – 7 mm long	3 – 6 mm long	4 – 6 mm long
Calyx lobes	Triangular, acute, 1 – 2.1 mm long	Triangular, acute, 2 – 3 mm long	Linear, acute, 2 – 3 mm long	Lanceolate, acute, 1.5 – 2 mm long
Corolla	Zygomorphic	Actinomorphic	Actinomorphic	Actinomorphic
Corolla tube	4 – 7 mm long, inner portion pink	5 – 8 mm long, inner portion light green	4 – 5 mm long, inner portion bright yellow	3 – 4 mm long, inner portion greenish-white
Corolla lobes	Elliptic, pink, broader lobes 1.4 – 5.6 × 0.8 – 3 mm, narrower lobes 1.3 – 3.5 × 0.7 – 1.8 mm	Oblong, pink or light pink, 4 – 7 × 3 – 4 mm	Ovate-elliptic, pink to light pink or white, 5 – 7 × 3 – 5 mm	Ovate, pink, 4 – 5 × 2 – 2.5 mm
Stamens	Anisomorphic, inserted at different levels	Anisomorphic, inserted in the middle part of the corolla tube	Isomorphic, inserted at upper part of corolla tube	Isomorphic, inserted at the throat of corolla tube
Filaments	Of lower stamens 0.5 – 1 mm long and of upper stamens 0.8 – 1.4 mm long	Of lower stamens 1.5 – 2 mm long and of upper stamens 2 – 3 mm long	1.4 – 1.8 mm long	3 – 4 mm long
Anthers	0.3 – 1.1 mm long	0.5 – 1 mm long	0.5 – 0.7 mm long	0.8 – 0.9 mm long
Ovary	Oblong, 2.8 – 6.5 × 0.5 – 2.8 mm	Oblong, 6 – 8 × 1.5 – 2.5 mm	Oblong, 6 – 7 × 1.5 – 2.5 mm	Oblong, 3 – 3.5 × 0.8 – 1 mm
Style	0.6 – 4.5 mm long	4 – 5 mm long	3 – 5 mm long	2.5 – 3 mm long
Stigma	Bilobed; lobes 0.3 – 0.7 × 0.2 – 0.5 mm	Bilobed, 0.9 – 1.2 × 0.6 – 0.7 mm	Bilobed, 0.4 – 0.6 × 0.2 – 0.3 mm	Bilobed, 0.2 – 0.3 × 0.1 – 0.15 mm
Capsule	Oblong, 3 – 7 × 1 – 3 mm	Oblong, 6 – 9 × 2 – 3 mm	Oblong, 4 – 6 × 2 – 3 mm	Oblong, 4 – 6 × 1 – 2 mm
Seeds	Irregular, cubical to rectangular, 0.25 – 0.33 × 0.17 – 0.28 mm, black	Irregular, cubical to rectangular, *ca.* 0.3 mm across, black	Irregular, subglobose, *ca.* 0.4 × 0.3 mm across, black	Irregular, cubical to rectangular, 0.2 – 0.3 × 0.15 – 0.25 mm, brown

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