



# Rediscovery of *Crotalaria digitata* (Fabaceae) from Madurai district, Tamil Nadu, India

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## Abstract

*Crotalaria digitata* Hook., an endemic and rare species has been collected after 178 years from its type locality. A detailed description, illustration and information on its habitat and threats are provided based on field survey. Confusion on its distribution due to misidentification of few collections from Coorg district in Karnataka also resolved.

Keywords: *Crotalaria*, Endemic, India, Rediscovery, Western Ghats

## Introduction

*Crotalaria* L. includes c. 700 species, distributed in the tropics and subtropics (Mabberley, 2008) mostly in Africa and America. In India, it is represented by 93 species, 1 subspecies, 17 varieties and 2 formae and larger proportion of them are found in peninsular India (Ansari, 2008). Totally there are 38 endemic species in this genus and 36 have been identified by Ansari (2008) as conservation priority species. During quantitative and mapping study of potential plant bioresource species in southern Western Ghats, a *Crotalaria* plant with more than 3 leaflets was collected. It did not match with the other two multi-foliolate species, viz., *C. grahamiana* Wight & Arn. and *C. quinquefolia* L. Further detailed study lead to *C. digitata* Hook., which was never collected since 1829 and listed as priority species for conservation by Ansari (2008).

*Crotalaria digitata* Hook. was first collected by Robert Wight from Madura Hills (Madurai, Tamil Nadu) in 1829 and named as *C. tomentosa*. Later in 1830, Wight sent his specimen to W.J. Hooker who found that the name *C. tomentosa* Rottler was already existing for another simple-leaved species hence he renamed it as *C. digitata* (Hooker, 1831). Wight & Arnott (1831) citing the specimen Wight Cat. No. 705 followed the name *C. digitata* given by Hooker. Gamble (1918) mentioned Carnatic, Kollaimalai Hills (Kolli Hills) of Salem district (presently Namakkal district), Tamil Nadu as the place of collection for this species by citing Wight.

The reason for this confusion could not be traced though Gamble vouched the identity of specimen (Wight 705) available at K. In Flora of Tamil Nadu, Malathi (1983) mentioned its distribution as Madurai and Salem districts of Tamil Nadu based on earlier literature. Ansari & Thothathri (1988) mentioned Kolli and Palani hills of Tamil Nadu (in addition to Karnataka) as its distribution. But neither are there any herbarium specimens at MH nor authentic report of its occurrence from either of these locations in spite of these districts been intensively explored by subsequent collectors (Subramanyam & Henry, 1959; Britto, 1983; Ravikumar, 1993; Matthew, 1999; Pallithanam, 2001; Pullaiah & Ramamurthy, 2002).

Saldanha (1984) and Keshavamurthy & Yoganarasimhan (1990) refer to its distribution in Kodagu (Coorg) district based on A.S. Rao's collections (75081 – Sept. 11, 1961 and 94812 – Oct. 18, 1963) from Gundukatti estate, Sunticoppa, Coorg, Karnataka. Ansari (2008) though has not seen the specimens, cited Saldanha (1984) with reference to distribution of *C. digitata* in Karnataka. In the present study said collections deposited at BSI, Pune, have been identified as *C. grahamiana* Wight & Arn.

However, the earlier report on the occurrence of *C. digitata* Hook. from Madurai district is now confirmed and the present collection is a rediscovery

after a lapse of 178 years from its type locality. This study highlights the need for intensive exploration with a focus on rare and threatened plants. Detailed description and illustrations (Fig. 1) are provided based on recent collection for locating and identifying this rare species.

***Crotalaria digitata*** Hook., Bot. Misc. 2: 354, suppl. t. 16. 1831; Wight & Arn., Prodr. Fl. Ind. Orient.: 194. 1831; Baker in Hook.f., Fl. Brit. India 2: 85. 1876; Gamble, Fl. Madras: 301. 1918; Malathi in A.N. Henry *et al.*, Fl. Tamil Nadu 1: 96. 1983; A.A.

Ansari & Thoth. in M.P. Nayar & Sastry, Red Data Book Ind. Pl. 2: 109. 1988; Sanjappa, Leg. India: 119. 1992; A.A. Ansari, *Crotalaria* India: 295. 2008.

Shrubs, to 2 m high. Stems slender, few branched, ribbed, silky white-tomentose (turning golden brown when dry). Leaves digitately compound, alternate, stipulate; stipules 2, filiform, subulate, 8–10 mm long, reflexed and clasping the stem, tomentose, persistent; leaflets 5 (rarely 7 as mentioned by Hooker and other workers, but our specimens has only 5 leaflets), unequal or few are underdevel-

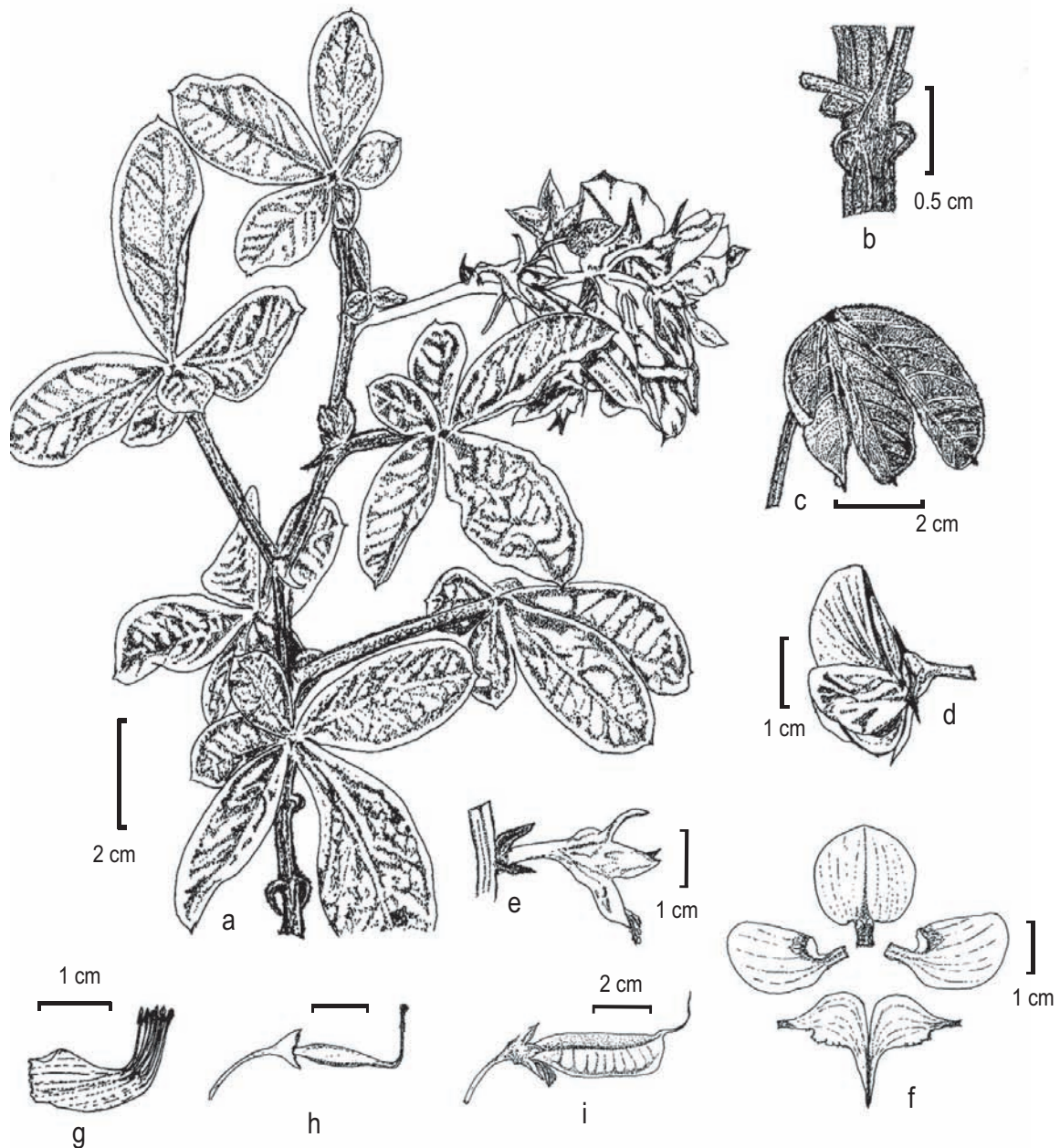


Fig. 1. *Crotalaria digitata* Hook.: a. Habit; b. Nodal part of stem; c. Leaf; d. Flower; e. Calyx; f. Petals; g. Staminal tube; h. Pistil; i. Pod.

oped, obovate, 4.5 – 6 × 2 – 3.5 cm, acute at base, obscurely retuse with a prominent mucro, silky white-tomentose; petioles 5.5 – 8.5 cm long, white-tomentose; lateral veins 5 – 7 pairs, obscure above, prominent below; petiolules 1 – 2 mm long, silky-tomentose. Inflorescences a raceme, terminal, rarely lateral, 10 – 26 cm long. Flowers bisexual, 5-merous, zygomorphic, 2 – 2.5 × 1 – 1.5 cm, closely arranged; bracts lanceolate, 10 – 13 × 2 – 3 mm, glabrous inside, velvety outside; bracteoles linear-oblong, 5 – 8 × 1 – 2 mm, glabrous inside, tomentose outside; pedicels 1.5 – 1.8 cm long (but elongating in fruits to 2.2 cm), glabrous, declinate. Calyx tube campanulate, c. 1.5 × 1 cm, glabrescent, glabrous later, greenish brown when dry; teeth subequal, ovate, c. 1.5 × 5 mm, abruptly acuminate at apex, glabrous. Corolla exserted, yellow; vexillum suborbicular, 2.3 – 2.5 × 2 – 2.8 cm, auricled and with 2 prominent calli at base, entire at margins, retuse-emarginate at apex, glabrous; wings 2, oblong, 18 – 20 × 8 – 10 mm, auricled and clawed at base, entire at margins, obtuse at apex; claw 5 – 7 × c. 2 mm; keels falcate, c. 2.8 × 1.2 cm, auricled and clawed at base, entire but crisply wavy towards base at margins, acuminate at apex, glabrous; claw c. 5 × 1 mm. Stamens 10, monadelphous; staminal column free above, connate to c. 1.2 cm, white; anthers dimorphic, alternate, basifixed, orange-yellow; larger 5, linear-oblong, c. 5 mm long; smaller anthers 5, ovoid, c. 1 mm long. Ovary oblong, 5 – 7 × c. 3 mm, glabrous; style geniculate, 1.5 – 1.8 cm long, glabrous; stigma terminal, subcapitate. Pods stipitate, oblong, 4 – 5.5 × 1.5 – 1.8 cm, mucronate with persistent style base at apex, inflated, glabrous, pale yellow, dehiscent; stipes to 7 mm long; seeds 15 – 25, orbicular, c. 5 mm, marginal, brown.

*Flowering & Fruiting:* October – December.

*Habitat:* Crevices with soil on barren rock faces and huge boulders.

*Distribution:* A stenoendemic species confined to Western Ghats of Madurai district, Tamil Nadu.

*Specimens examined:* INDIA, **Tamil Nadu**, Madurai district, Pulipatti, Alagar Hills, 189 m, 19.11.2007, R. Ganesan & R. Kottaimuthu 50588; Pulipatti, Alagar Hills, 205 m, 10.12.2007, R. Ganesan & R. Kottaimuthu 50625 (Herbarium ATREE, Bengaluru).

*Ecology & Threat Status:* The other associated plant species found in the habitat are species of grasses such as *Themeda cymbaria* Hack, *Cymbopogon flexuosus* (Nees ex Steud.) Will. Watson, *Chrysopogon fulvus* (Spreng.) Choiv., shrubs such as *Canthium parviflorum* Lam. and ferns such as *Actiniopteris radiata* (Sw.) Link, *Hemionitis arifolia* (Burm.f.) Moore and

*Cheilanthes mysurensis* Wall. ex Bedd. These plants are found precariously holding on to the soil found in the crevices of bald rocks on a hillock. The hillock is surrounded by cashew and mango plantations and dry farmlands. During the present study only 10 mature individuals are seen in the locality along with few saplings. Using IUCN guidelines it has been categorized as a Critically Endangered (CR) species, based on B2(a)(civ); D.

*Notes:* The digital images of two collections from Kew under the name *C. digitata* were also referred. One collection designated as type referred to Bot. Misc. 2: 354 must have been studied by Hooker (*l.c.*) to describe the species. The second collection bearing Wight Cat. No. 705 must have been originally collected by Wight and referred by Wight & Arnott (1831). Based on an annotation, “Hooker’s type originally *C. tomentosa* in Bot. Misc. 2: 354 came from seeds sent from Madeira” at the bottom of the Wight’s collection, it is evident that Hooker described *C. digitata* from the plant raised from seeds sent by Wight from ‘Madeira’ (Madurai) during 1830. Hooker’s (1831.) note “this very handsome species of *Crotalaria*.....”, confirms that he had seen the live plant. This species is generally mixed-up with *C. grahamiana* and *C. quinquefolia*. These three species are the only Indian *Crotalaria* grouped under the subsection *Polyphyllae* of Section *Crotalaria* as their leaf is digitately compound. However, *C. grahamiana* can be distinguished based on its linear obovate leaf with hairs on the undersurface. *Crotalaria quinquefolia* has comparatively more linear leaf with obtuse or faintly emarginate apex.

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