

Crawfordia delavayi (Gentianaceae): a new record for India and its typification

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Abstract: *Crawfordia delavayi* Franch. (Gentianaceae), a species hitherto known only from China, has been collected from Lal Ane Hills of Arunachal Pradesh, India in 2022, which makes a new addition to the Indian flora. Furthermore, a lectotype for this name has been designated here.

Keywords: Arunachal Pradesh, Lal Ane Hills, Lectotype, Indian Himalayan Region (IHR)

Introduction

The genus *Crawfordia* Wall. belongs to the subtribe Gentianinae under the tribe Gentianeae (Struwe *et al.*, 2002; Chen *et al.*, 2005) in the family Gentianaceae. It comprises of about 19 species worldwide (Mabberly, 2017) with mostly twining herbs, and are found in South to Southeast Asia. In India, this genus is represented by 5 species (Jayanthi, 2020) confined in Eastern Himalayas and northeastern states. Arunachal Pradesh representing a major part of the Indian Eastern Himalayas, is bestowed with 4 species of *Crawfordia*, namely, *C. angustata* C.B. Clarke, *C. arunachalensis* S.S. Dash *et al.*, *C. campanulacea* Wall. & Griff. ex C.B. Clarke, and *Crawfordia speciosa* Wall. (Giri *et al.*, 2008; Dash *et al.*, 2011; Jayanthi, 2020).

During field survey at Lal Ane Hills and adjoining areas in Arunachal Pradesh in 2022, some specimens of *Crawfordia* were collected by

the first author. Scrutiny of relevant literature (Wallich, 1826; Clarke, 1885; Franchet, 1899; Merrill, 1923; Ridley, 1923; Smith, 1965; Liu & Kuo, 1978; Ubolcholaket, 1987; Ho & Pringle, 1995; Zheng & Yao, 1998; Aitken 1999; Hul, 2002; Giri *et al.*, 2008; Dash *et al.*, 2011), revealed the identity of one of the collected specimens as *Crawfordia delavayi* Franch., hitherto only known from China. This collection of *C. delavayi* makes a new addition to the Indian flora. A detail description and illustration are provided here for its easy identification along with an artificial key for the *Crawfordia* species found in Arunachal Pradesh. It was also found that the name *C. delavayi* Franch. is yet to be typified. Therefore, a lectotype has been designated here for this name in the present communication.

Materials and Methods

The herbarium specimens were prepared following Jain & Rao (1977). Dried plant material was studied using Nikon SMZ1500 stereo-zoom microscope. The flowers were dissected, illustrated and the identity was confirmed with the relevant literature (Smith, 1965; Ho & Pringle, 1995), as well as by consulting digital images of specimens from E, K, KUN (acronyms of Herbaria follow Thiers, 2025, continuously updated).

Taxonomic treatment

Crawfordia delavayi Franch., Bull. Soc. Bot. France 46: 306. 1899. *Lectotype* (designated here):

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CHINA, “La Chine Occidentale, sur le mont Tsang-chan, au dessus de Tali, parmi les Bambous nains, alt. 3500 m.”, 26.09.1886, *Delavay* n. 143 (P [P00354080, digital image!]); residual syntypes: *ibid.*, 26.09.1884 (A [A00072167, digital image!], P [P00354081, P00354083, P00354084, digital images!], UPS [V-089224, V-1155359, digital images!]; 26.08.1886 (P [P00354082, digital image!]), 20.08.1887 (P [P00354085, digital image!]); 29.09.1889 (P [P00354086, digital image!]).

Figs. 1-2

Twining herbs. Stems terete, spirally twisted, glabrous to glabrescent. Leaves opposite, coriaceous, sessile to shortly petiolate; petiole slightly flattened, up to 0.5 cm long, grooved towards stem, slightly broadened towards base; lamina lanceolate to ovate, 1–4.5 × 0.3–2 cm, base acute to cuneate, sometimes rounded, margin entire to slightly crenate, apex acute to

acuminate, glabrous on both surfaces, bright green adaxially, dull green abaxially; venation multicostate, reticulate, basal nerves 3–5, prominent. Inflorescence axillary, 1–2-flowered at each axil; pedicels terete, up to 1 cm long, glabrous. Bracts mostly caducous, very minute, linear to narrow lanceolate, 0.1–0.2 cm long, green–purple. Calyx campanulate to tubular, 5-lobed at apex; lobes linear to lanceolate, 0.1–0.4 cm long, margins entire, apex acute, glabrous, green; tube 0.8–1.2 cm long, slit at one side, apex without intracalycular membrane, glabrous, green. Corolla campanulate, 3–3.5 cm long, glabrous, blue–purple; tube ventricose, lobes broadly ovate, 0.2–0.5 × 0.3–0.4 cm, apex acute, plicae slightly semi-circular to bluntly triangular, 0.1–0.3 × 2–4 cm, margins erose, pale than lobes. Stamens 5, inserted at the middle of the corolla tube; filaments linear, free portion 0.7–0.9 cm long, all equal, glabrous; anthers ellipsoid, 0.2–0.3 cm long, glabrous, white. Gynoecium almost equalling or slightly shorter than corolla tube, pale green, glabrous; ovary oblong, 0.8–1.1 cm long; gynophore 0.7–1.5 cm long, slender with oval nectary glands at base; style linear, stout, 0.5–0.8 cm long; stigma bifid, often recurved, creamy-white. Fruits not seen.

Flowering & fruiting: Flowering from August to September; Fruiting from September–October (Ho & Pringle, 1995).

Habitat: *Crawfordia delavayi* was found in the open subalpine *Rhododendron* scrubs at elevations of 3000–3200 m. This species was also found to be often associated with *Rosa* sp. or *Cotoneaster* sp. in the similar area where abundant light is available.

Distribution: India (Arunachal Pradesh) [Fig. 3], China (North-West Yunnan; Ho & Pringle, 1995).

Specimen Examined: INDIA, **Arunachal Pradesh**, Papum Pare District, Lal Ane Hills, near Abe Jering, 3200 m, 20.09.2022, *R. Maity & S.S. Dash* 46436 (CAL).



Fig. 1. Lectotype of *Crawfordia delavayi* Franch. (P00354080) © Muséum National d'Histoire Naturelle (P), Paris.

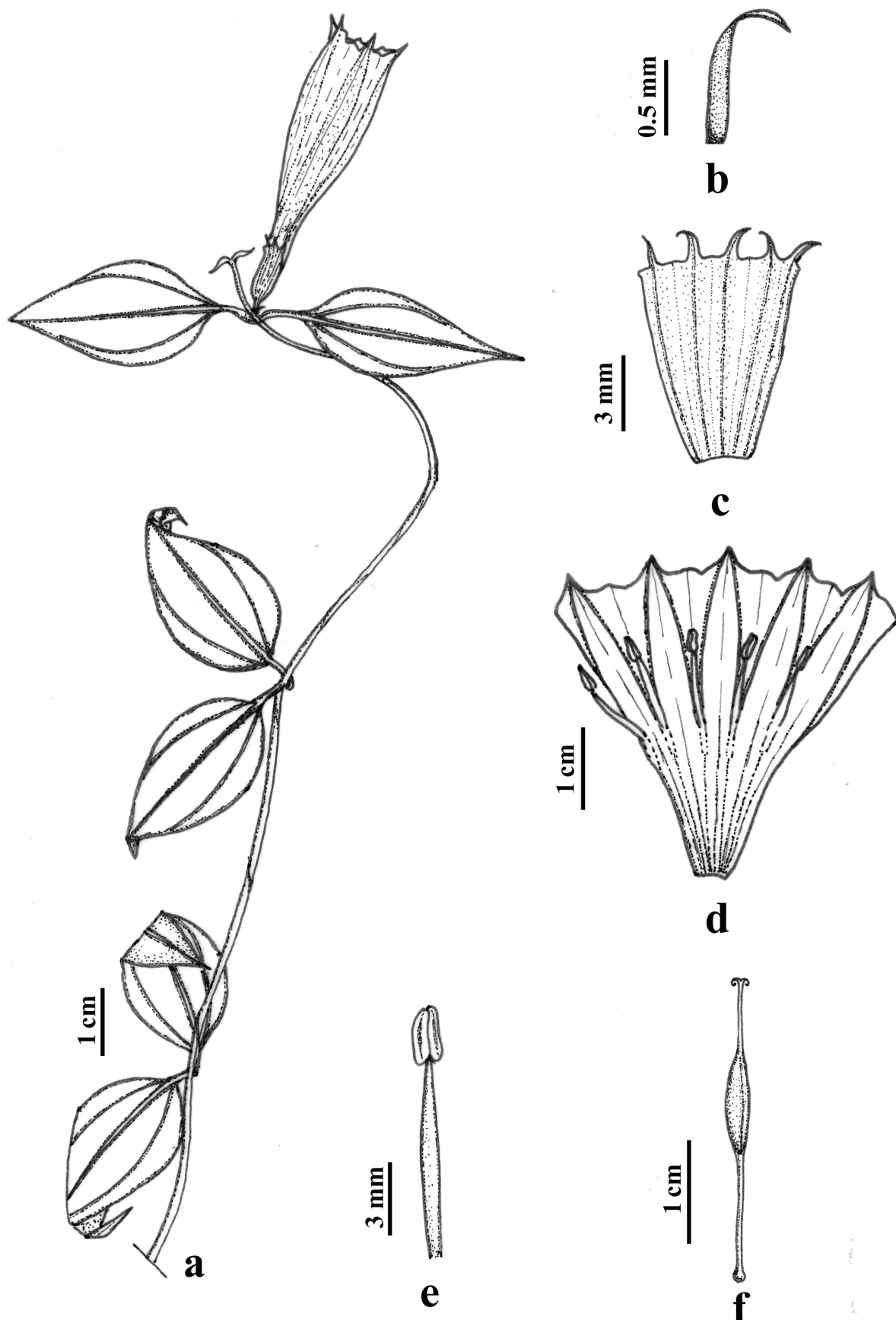


Fig. 2. *Crawfordia delavayi* Franch.: a. habit; b. bract; c. calyx split open; d. corolla split open; e. stamen; f. gynoecium [drawn by Rohan Maity].

Notes on typification

Crawfordia delavayi is morphologically very similar to *C. speciosa* Wall. in having blue to bluish-purple flowers of nearly similar size. Though corolla of *C. speciosa* tend to be slightly longer than *C. delavayi*. However, *C. delavayi* can easily be differentiated from *C. speciosa* by its smaller, sessile to sub-sessile, lanceolate-ovate leaves with entire margin (*vs.* much bigger, petiolate, broadly ovate leaves with crenulate margin), and most characteristic calyx having much smaller linear to narrow-lanceolate calyx lobes without any intra-calycular membrane on the apex of tube (*vs.* calyx having bigger triangular to ovate lobes with an intra-calycular membrane on the apex of tube). During scrutiny of literature to identify the collected specimens of *Crawfordia*, authors came across that the name *C. delavayi* Franch. is not yet typified. Franchet (1899) described *C. delavayi* based on Delavay's specimen with the number 143, from Mountain Tsang-chan in China. However, Delavay's collections of "n. 143" were found to be comprising of different gatherings collected on 26 Sept. 1884, 26 Aug. 1886, 26 Sept. 1886, 20 Aug. 1887, and 29 Aug. 1889 and therefore all are to be treated as syntypes *vide* Art. 9.6 of the *Shenzhen*

Code (Turland *et al.*, 2018). Therefore, a lectotype has been chosen amongst the available syntypes present in P, HUH and UPS in accordance to Art. 9.3, 9.4, 9.12 of the *Shenzhen Code*. The specimen in P (P00354080) has been designated as the lectotype of the name *C. delavayi* due to its better preservation and complete agreement with the protologue.

Key to the taxa of *Crawfordia* in Arunachal Pradesh

1. Calyx lobes connate 2
1. Calyx lobes free 3
2. Capsule included or slightly excluded of corolla *C. campanulacea*
2. Capsule completely excluded from corolla *C. arunachalensis*
3. Calyx tube without intra-calycular membrane at apex *C. delavayi*
3. Calyx tube with intra-calycular membrane at apex 4
4. Corolla pink to white, more than 5 cm long; lobes long, narrow triangular *C. angustata*
4. Corolla blue to bluish-purple, sometimes faded to white with purple tinge, less than 5 cm long; lobes short broadly triangular *C. speciosa*



■ Reported State of *Crawfordia delavayi* Franch. in India

📍 Present collection locality of *Crawfordia delavayi* Franch.

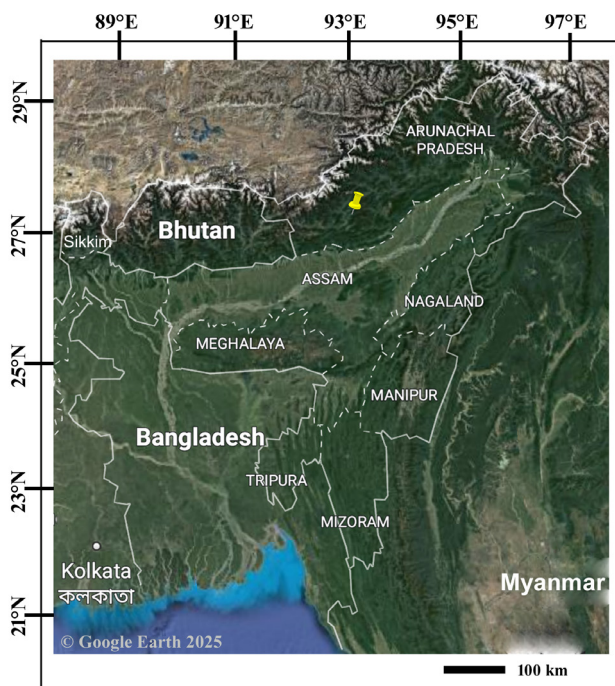


Fig. 3. Distribution map of *Crawfordia delavayi* in India.

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