



Rediscovery of *Phlogacanthus jenkinsii* (Acanthaceae) from India after 140 years

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Abstract

Phlogacanthus jenkinsii C.B. Clarke (Acanthaceae: Andrographideae), a poorly known species in India, is recollected after 140 years from Mizoram. A detailed taxonomic description along with a photo plate, illustration and comparative diagnostic characters with closely allied species are provided in the present communication.

Keywords: Andrographideae, Mizoram, North-East India, *Phlogacanthus*, *Cystacanthus*

Introduction

The genus *Phlogacanthus* Nees von Essenbeck (1832: 76, 99) is a genus of Acanthaceae placed in the tribe Andrographideae and comprises of about 40 species worldwide (Hu *et al.* 2011, Hai *et al.* 2018). The genus is closely related to *Cystacanthus* Anderson (1867: 457) but differs only in the corolla shape and indumentum. The genus *Cystacanthus* is recognized by many authors (Scotland 1992, Scotland & Vollesen 2000, Hu 2002, Wu *et al.* 2003, Hu & Fu 2005) and it is considered to be the closest ally of the genus *Phlogacanthus* placed into the tribe Ruellieae. Molecular phylogeny indicated that species of *Cystacanthus* are nested within *Phlogacanthus* and a single genus, *Phlogacanthus*, could be accepted (Xia & Deng 2013). Deng (2020) divided the genus into three sections, *viz.* *Phlogacanthus* sect. *Cystacanthus* (T. Anderson) Deng (2020: 320), characterized by the corolla tube usually bent almost at 90° and abruptly inflated near throat; sect. *Pubinervia* Deng (2020: 325) characterized by having cylindrical and slightly curved corolla on axillary cymes or thyrse with exerted stamens; and sect. *Phlogacanthus* characterized by the corolla similar to sect. *Pubinervia*, but mostly on terminal inflorescences, with inserted stamens. The genus is mainly distributed in South and South-East Asian countries (Mabberley 2017, Hai *et al.* 2018). Currently, 13 taxa in genus *Phlogacanthus* are recognized from India (Maity & Dash 2021b), with highest concentration in North-East Indian states (Maity & Dash 2021a).

Phlogacanthus jenkinsii Clarke (1885: 511) described by Clarke based upon Jenkin's collection from British Assam and can be easily recognized by its many-flowered, compact axillary thyrse inflorescence. This species is closely allied to *P. pubinervius* Anderson (1867: 508) which differs in having 1–5-flowered, lax axillary cyme. This is the only member in sect. *Pubinervia* not found in entire Himalayan Region. This species was previously collected from India during colonial period probably in 1829, by Jenkins. Subsequently the species was collected during 1881–82 by G. Watt from Manipur. Kanjilal *et al.* (1934) reported this species in Flora of Assam based on Clarke (1885). Since the last collection, this species has never been recollected from India till recent, the present collection during 2022. During our study on the genus *Phlogacanthus* in India, *P. jenkinsii*, has been recollected from Mizoram after a gap of almost one and a half century.

The detailed taxonomic account of this little-known species is presented here. Colored photographs, line drawings of *Phlogacanthus jenkinsii* and its comparative diagnostic characters with closely allied species are also provided for easy identification. A map showing the new collection locality has also been supplemented.

Materials & methods

The voucher specimens were collected following standard protocols. Digital photographs were taken in field using Sony HX 400 camera. Flowers from dried materials were dissected, studied under Nikon SMZ1500 stereo-zoom microscope and illustration was prepared. Herbarium specimen was prepared following standard protocols and deposited in herbarium of Botanical Survey of India, Arunachal Pradesh Regional Centre, Itanagar (ARUN). Available literatures (Wallich 1830, 1831; Nees 1832; Anderson 1867; Beddome 1872; Clarke 1884; Kanjilal *et al.* 1934; Wood 1994; Maity & Dash 2020) were also consulted for confirming the identity of the species. Specimens housed in the herbaria ARUN, ASSAM, CAL, GUBH and digital images of specimens from various international herbaria were also consulted for comparison.

Taxonomic treatment

Phlogacanthus jenkinsii C.B. Clarke (1885: 511) [Figs. 1,2].



FIGURE 1. *Phlogacanthus jenkinsii* C.B.Clarke A. Habit, B. Inflorescence close up (photos by M. Sawmliana).

Lectotype:—(designated by Maity & Dash 2020): INDIA. Assam: *s.d.*, *Jenkins s.n.* (K, barcode K000950015, digital image!).

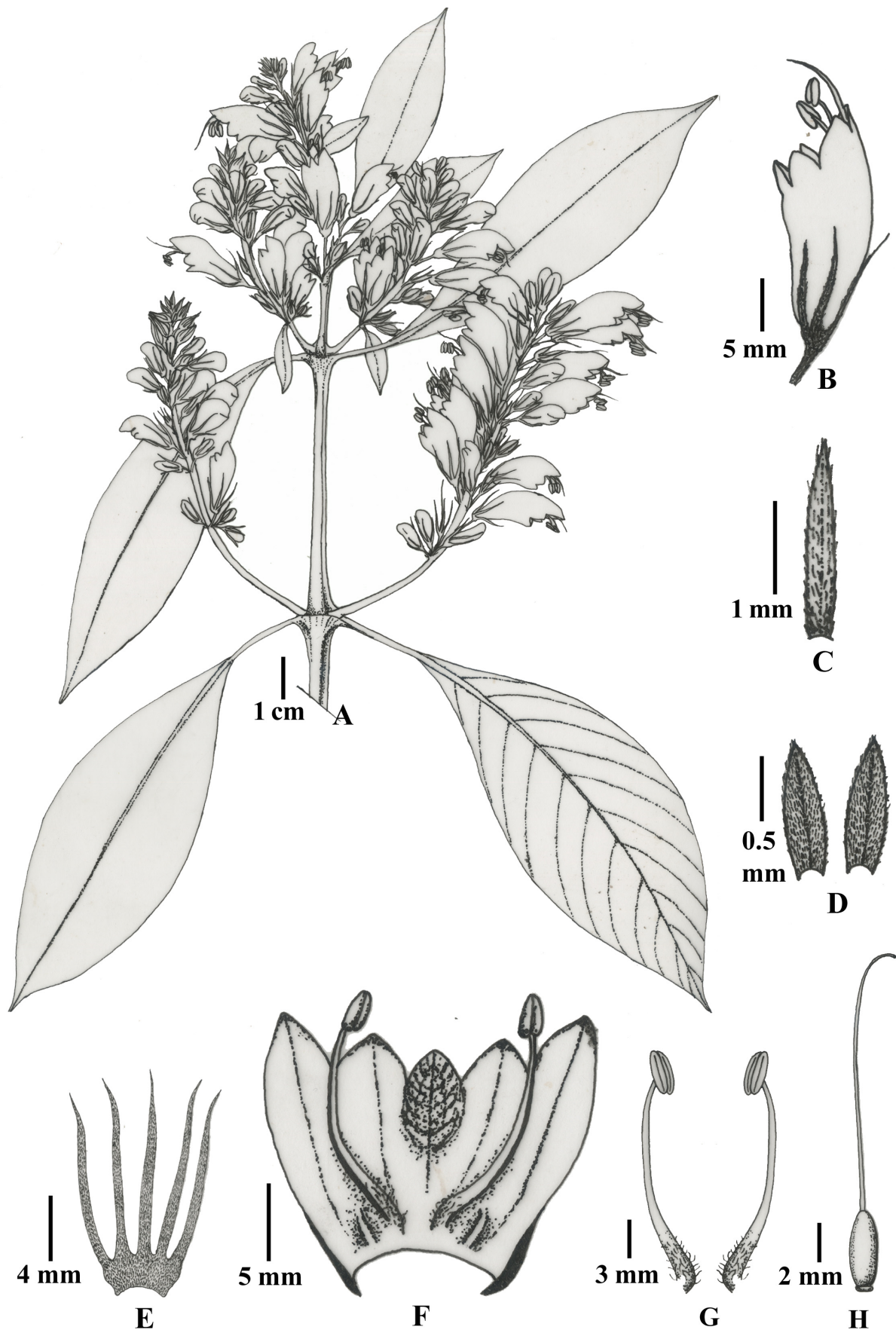


FIGURE 2. *Phlogacanthus jenkinsii* C.B.Clarke A. Habit, B. Mature flower-side view, C. Bract, D. Bracteoles, E. Calyx-split open, F. Corolla-split open, G. Stamens, H. Gynoecium (Illustrations by R. Maity)

Description:—Shrubs, up to 3 m tall; stem stout, quadrangular, sometimes ridged, pubescent when young, glabrous on maturity, green–red; leaves elliptic–lanceolate, 4–17(20) × 1.5–4.5(7) cm, apex acute–caudate, entire, cuneate, green, glabrous on both surface, petiolate; petiole ca. 4 cm long; inflorescence axillary, compact thyrse, ca. 7 cm long, many-flowered, peduncled; peduncle up to 4 cm long, puberulent; flowers zygomorphic, pedicellate; pedicel up to 5 mm long, puberulous; bracteate; bract 1 per flower, up to 2 mm long, linear, green, pubescent; bracteolate; bracteoles 2 per flower, subulate, ca. 1 mm long, green, dense pubescent; calyx campanulate, 5-lobed, densely grey pubescent; tube very short, ca. 2mm long; lobes linear–lanceolate, up to 1 cm long; corolla 2-lipped, slightly curved, 2–2.5 cm long, orange-yellow, pubescent outside; tube broader towards apex, 1.5–1.8 cm long, slightly curved; upper lip ca. 5 mm long, 2-lobed; lower lip ca. 2 mm long, 3-lobed; stamens 2, slightly exerted; filaments ca. 1.5 cm long, orange, mostly glabrous, filiform except base; base curved, slightly broader than apex, pubescent; anthers oblong, ca. 3 mm long, parallel, introrse, brown–greenish; staminodes 2, very minute, obscure, ridge like, only be seen in most mature flowers; ovary ovoid-oblong, ca. 4 mm long, green, glabrous, 2-chambered, 12-ovuled; style filiform, curved at apex, green–orange, glabrous; stigma minute, 2-cleft; fruits not seen.

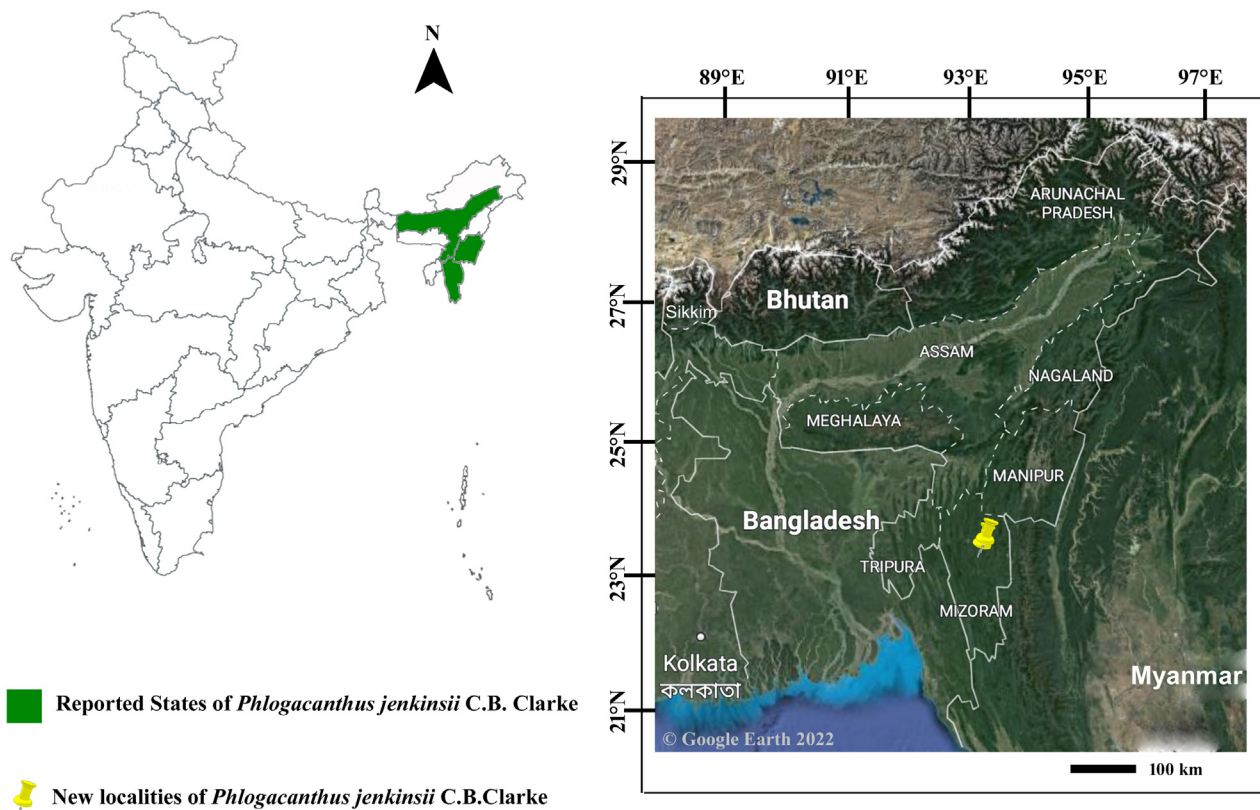


FIGURE 3. Distribution map of *Phlogacanthus jenkinsii* C.B. Clarke in India.

Vernacular name:—Kawldai-Par-Eng (Mizo)

Phenology:—Flowering from January to March.

Distribution:—India (Assam, Manipur, Mizoram) and Myanmar.

Specimens examined:—INDIA. Mizoram: Rulchawm, ca. 1100 m, 27 January 2022, *M. Sawmliana s.n.*, (ARUN). Assam: 1829, *s.coll., s.n.*, (K); Manipur: 1881–1882, *G. Watt 7360*, (CAL). MYANMAR. Katha State: Kadu Hill, 3000 ft, 23 February 1910, *J.H. Lace 5121* (E); “Upper Burmah, Valley of the Taping”, 2000 ft, February 1914, *G. Forrest 12170* (E); Sumprabum Sub-Division, “Two miles north west of Kanang”, 6500 ft, March 1962, *J. Keenan, U Tun Aung & U Tha Hla 3900* (E).

Threat assessment as per IUCN guidelines (IUCN, 2012a, 2012b, 2019):—The species was known from five collections from Assam and Manipur without any precise locality. During our present study, we have collected the species from four localities in and around Rulchawm, Mizoram. Based on the present and past collections the area of occupancy (AOO) is calculated to 500 km² with very limited distribution at less than 5 locations where the habitats are continuously shrinking due to developmental works. Therefore, the taxon is assessed here as endangered [EN B2ab(iii)] in India.

Discussion

Dutta *et al.* (2016) and Dutta (2020) stated that *Phlogacanthus jenkinsii* was collected during 2016, from Assam and specimens were deposited in Herbarium, Guwahati University (GUBH). But scrutiny of literature revealed that the image provided by Dutta *et al.* (2016) is inaccurate and cannot be established its identity as *Phlogacanthus jenkinsii*. While consulting the GUBH, we could not trace any herbarium specimens “Dutta 49” & “Dutta 50” (mentioned in Dutta *et al.* 2016) collected on 25 January 2016 from Hamren, Karbi Anglong district of Assam or “*B.Dutta 18746*” and “*B.Dutta 18747*” (mentioned in Dutta 2020). However, two specimens, *Dutta 03* (accession no GUBH 018746) and *Dutta 04* (accession no GUBH 018747) collected from the same locality exactly one year before on 25 January 2015 were found. GUBH 018746 and GUBH 018747 are actually *Phlogacanthus thyrsoformis* (Roxb. ex Hardwicke) Mabberley (1980: 83) but misidentified as *P. jenkinsii*. One colored photo plate showing the dissected flower parts given by Dutta in her Ph.D. thesis is actually of yellow coloured variant of *P. thyrsoformis* but not *P. jenkinsii*. A comparative analysis of morphological characters of *P. jenkinsii* and its allied species *P. pubinervius* and *P. thyrsoformis* is given in Table 1.

TABLE 1. Comparison of diagnostic characters of *Phlogacanthus jenkinsii*, *P. pubinervius* and *P. thyrsoformis*.

Characters	<i>Phlogacanthus jenkinsii</i>	<i>P. pubinervius</i>	<i>P. thyrsoformis</i>
Leaves	elliptic–lanceolate	elliptic–broad ovate	elliptic–oblanceolate
Inflorescence	axillary, compact thyrse ca.7 cm long, always more than 10-flowered	axillary, lax cyme, less than 7 cm, 1–5-flowered	terminal, densely compact thyrsoid-raceme, rarely also on apical leaf axils, always more than 10 cm long, many-flowered
Bracts and bracteoles	caducous; minute, bracts up to 2 mm long; bracteoles ca. 1 mm long	caducous, small, bracts and bracteoles both up to 3 mm long	persistent, very long, 7–15(–20) mm long.
Calyx	lobes linear–narrow lanceolate, up to 10 mm long, densely grey pubescent on both surfaces.	lobes oblong–lanceolate, 5–6 mm long, pubescent outside, tomentose inside.	lobes linear, up to 15 mm long, densely pubescent.
Corolla	2–2.5 cm long; tube 1.5–1.8 cm long, slightly curved, broader towards apex	1.6–1.8 cm long; tube 1.1–1.3 cm long, slightly curved, broader towards apex,	2.5–3 cm long, tube 1.9–2.3 cm long, slightly curved, broader from base
Stamens	2; filaments slightly exerted, ca. 1.5 cm long; base slightly broader than apex, pubescent at base	2, filaments much exerted, 2–2.5 cm long, uniform, glabrous	2, included, sometimes only anthers exerted beyond corolla lobes; filaments 1.2–1.3 cm long, uniform, hirsute at base

Therefore, the present discovery of *Phlogacanthus jenkinsii* from Mizoram, constitutes the first collection of the taxon after 140 years since Watt’s collection during 1881–82 from Manipur. This report also constitutes a new record of *Phlogacanthus jenkinsii* to the state of Mizoram, as the species never been reported before from Mizoram (Shukla & Sinha, 2012). The type locality as well as the rediscovered locality, are continuously facing habitat degradation due to enormous developmental activities. Therefore, it is suggested that the species is in need of immediate attention for conservation both through *ex-situ* and *in-situ* measures.

Acknowledgement

The authors are grateful to Dr A.A. Mao, Director, Botanical Survey of India, Ministry of Environment, Forest & Climate Change (MOEF&CC), Government of India, for all necessary supports and encouragement. Sincere thanks are given to the curators of following herbaria, *viz.*, ARUN, ASSAM, CAL, E, GUBH & K for providing the species concerned accessible for study and furnishing relevant information. Authors would also like to thank Prof. Yungfei Deng, Chinese Academy of Sciences, for his helps and suggestions for amelioration of the manuscript.

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