

Lectotypification of Seven Names in genus *Phlogacanthus* (Acanthaceae)

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फ्लोगेकेन्थस वंश (एकेन्थेसी) में सात वानस्पतिक नामों का लेक्टोटाइपिफिकेशन

रोहन मैती एवं सुधांशु शेखर दाश

सारांश

वंश फ्लोगेकेन्थस (एकेन्थेसी) की चार जातियों जिनमें फ्लोगेकेन्थस जेन्कीन्साई सी बी क्लार्क, फ्लोगेकेन्थस लम्बर्टाई रायजादा, फ्लोगेकेन्थस पार्वीफ्लोरस टी. एन्डर्स., एवं फ्लोगेकेन्थस प्यूबीनर्वीयस टी. एन्डर्स. को प्रस्तुत शोध पत्र में लेक्टोटाइपिफाइड किया गया है। इसके अतिरिक्त तीन अन्य नामों *जस्टिसिया कर्विफ्लोरा* वाल. [बेसियोनिम्स फ्लोगेकेन्थस कर्विफ्लोरस (वाल.) नीस], *लोखन्थस गोमेजाई* नीस [बेसियोनिम्स फ्लोगेकेन्थस गोमेजाई (नीस) जे. आर. आई बुड] एवं *जस्टिसिया गुट्टाटा* वाल. [बेसियोनिम्स फ्लोगेकेन्थस गुट्टेटस] को भी लेक्टोटाइप किया गया है।

ABSTRACT

Four names in the genus *Phlogacanthus* (Acanthaceae) viz., *Phlogacanthus jenkinsii* C.B. Clarke, *Phlogacanthus lambertii* Raizada, *Phlogacanthus parviflorus* T. Anders., and *Phlogacanthus pubinervius* T. Anders. are lectotypified in the present communication. In addition, three other names i.e., *Justicia curviflora* Wall. [basionym of *Phlogacanthus curviflorus* (Wall.) Nees], *Loxanthus gomezii* Nees [basionym of *Phlogacanthus gomezii* (Nees) J.R.I. Wood] and *Justicia guttata* Wall. [basionym of *Phlogacanthus guttatus* Nees] are also lectotypified.

Key words: Acanthaceae, *Justicia*, *Justiceae*, *Loxanthus*, *Phlogacanthus*, India, Typification.

INTRODUCTION

The genus *Phlogacanthus* (Acanthaceae: Justiceae) with c. 15 species is restricted in the South-East Asian countries only (Hu, C.C. & al., 2011; Mabberley, 2018). In India the genus is represented by 13 species out of which 11 species are known from Indian Himalayan region. *P. lambertii* is the only species found in Western Himalayas (Uttarakhand) whereas the remaining 10 are found in North-East India and Eastern Himalayas (Lakshminarasimhan & al., 2020). All the taxonomic treatment or enumerations on the genus (Wallich, 1830-31, Nees, 1832, Anderson, 1867, Beddome, 1872, Clarke, 1884, Kanjilal & al., 1934, Benoist, 1935, J.R.I.

Wood, 1994) from India are based on the historic collections with very limited information. In the present communication seven names under *Phlogacanthus* Nees are lectotypified strictly in accordance with the provisions in the International Code of Nomenclature for algae, fungi, and plants (Turland & al., 2018). An explanatory note for each of the species is provided to justify the need for the lectotypification.

MATERIALS AND METHODS

Few live specimens were collected recently while working on the project “Flowering plants diversity in Lal Ane hills and its surroundings (Mengio circle, Papum

Pare District), Arunachal Pradesh” and an account of the genus *Phlogacanthus* was prepared. During identification, authenticate collections, especially types deposited in CAL and also in ASSAM, ARUN, DD, and MH, were examined and bibliographical citations in the original publications and various online databases such as IPNI (The International Plant Names Index; <http://ipni.org/>), Tropicos (<http://www.tropicos.org/>), and the World Flora Online (<http://www.worldfloraonline.org>) were also checked. Furthermore, digitized type images available online at BM, E, GZU, K, M, NY, P, and U were also examined.

The provisions given in International Code of Nomenclature for algae, fungi, and plants (Turk & al., 2018) were strictly followed for lectotypification of names. Extensive herbarium studies were carried out to trace all the existing syntypes deposited in different herbaria, and the best-preserved original specimen strictly adhering to the description mentioned in the protologue are designated as lectotypes along with their barcode numbers following the herbarium acronym. The enumeration is arranged alphabetically by the accepted names and all available homotypic synonyms are given followed by the type citations.

TYPIFICATION OF NAMES

1. *Phlogacanthus curviflorus* (Wall.) Nees in Wall., Pl. Asiat. Rar. 3: 99. 1832. *Justicia curviflora* Wall., Pl. Asiat. Rar. 2: 9, t. 112. 1831. Type: Bangladesh: “Crescit in montosis Sylhet [Sylhet] propinquis, indeque a De Silva in Hortum Calcuttensem missa. Floret fructificatque versus finem anni.” October 1828, Wall. Cat. n. 2429A, B (lectotype K, barcode 001115916, selected here, digital image! (Fig. 1); isolectotypes, CAL! barcode CAL0000020041!; CAL0000020042!; CAL0000020043!; K, barcode K000950024, digital image!, K001115917, digital image!; M, barcode M0186719, digital image! E, barcode E00273556, digital image!)

Notes: Wallich, for his *Justicia curviflora* (1831: 9), mentioned about collection by Francisco De Silva (“De Silva”) from Sylhet and the cultivation at the Calcutta Botanical Garden, and thus indicated about the possible housing of the collection at the CAL Herbarium. Nees von Esenbeck (1832: 99) transferred *Justicia curviflora* Wall. to the genus *Phlogacanthus* and made the new combination *P. curviflorus*. We traced four specimens with “2429 A” on two sheets at K and one sheet at E and M each. Two specimens with Wall. Cat. n. “2429 B” were found in CAL and K. In addition to these, two sheets with Wall. Cat. n. 2429 were also found in CAL.

Dutta & al. (2016: 473) cited “Type: Bangladesh, Mt. Sillet, Wallich, N., #2429a (M0186719, E00273556).” Although they cited original materials as type, they did not lectotypify the species name because they did not use the phrase “designated here” or its equivalent as required by Art. 7.10. Furthermore, along with the original material, they also cited “Thailand, Siam, Hosseus, C.C., #305a, 31.12.1904 (M 0168711)”, a non-original material, as part of the type citation. Consequently, their type citation does not have any nomenclatural standing. Specimen found in K, 2429A with barcode K001115916 (digital image!) is selected here as the lectotype.

2. *Phlogacanthus gomezii* (Nees) J.R.I. Wood, Edinburgh J. Bot. 51 (2): 182. 1994. *Loxanthus gomezii* Nees in Wall., Pl. Asiat. Rar. 3: 99. 1832. Type: Bangladesh: “In montibus provincial Sylhet [Sylhet] legit Guil. Gomez, a. 1829”, “Wall. Cat. n. 7170”. (lectotype step I (designated by J.R.I. Wood, Edinburgh J. Bot. 51(2): 182. 1994: “Type ... Gomez in Wallich 7170 (iso. K-W)”; lectotype step II, K, barcode K001126819, left-hand specimen selected here, digital image! (Fig. 2); isolectotypes, K, barcode K001126819, right-hand specimen, digital image!; CAL!, barcode CAL0000072610! BM, barcode BM001191499, digital image!).

Phlogacanthus wallichii C.B. Clarke in Hooker, J.D., Fl. Brit. India 4: 511. 1885. **nom. superfl.**; **nom. illegit.**

Notes: Clarke (1885: 511) transferred *Loxanthus gomezii* Nees (1832: 99) to the genus *Phlogacanthus* and renamed it as *P. wallichii* C.B. Clarke and thus created a superfluous illegitimate name. Since *L. gomezii* is a legitimate name having priority from 1832, Wood (1994: 182) published the new combination *P. gomezii*. Although, Nees did not use the term type or mention the names of the herbaria housing the specimen(s), he did indicate the type by citing “Wall. Cat. n. 7170”. In our search, we located specimens at CAL, BM, and K, and all the three sheets show the same collection information.

Dutta & al. (2016: 473) cited “Type: Bangladesh, Sillet, s. coll., #7170, K000950023.” [We found that the sheet K000950023 (digital image!) has an original label showing “[Wall. Cat. n.] 7171 *Phlogacanthus asperulus* N. ab E., HBC e Sillet and lacks the date of collection. In April 1882, C.B. Clarke, in his annotation on the sheet, mentioned the following: I have compared the type specimens in Wallich’s Herbarium. This is a wrong number. It should be 7170 (*Loxanthus gomezii*, Nees) (sic). Subsequently, Clark (1885: 511), for his superfluous name *P. wallichii*, cited “*P. asperulus* Wall, Cat, 7171 partly, not of Nees” and “*Loxanthus gomezii*, Nees in Wall. Cat. 7170” as synonyms. Although K000950023

is an original material, it was not likely used by Nees for his *L. gomezii*. Furthermore, Dutta & al. did not inadvertently designate the K specimen as the lectotype because, they did not use the phrase “designated here” or its equivalent as required by Art. 7.10. Consequently, their type citation does not have any nomenclatural standing. Wood (1994) mentioned “Type ... Gomez in Wallich 7170 (iso. K-W)”. Since Wood did not use the term lectotype, it is debatable whether his usage of the term “iso-” is correctable to lectotype. Since there was no holotype or isotype formally designated for this taxon, Wood’s citation of “isotype” is correctable to lectotype (vide Shenzhen Code Art. 9.10 (Turland & al., 2018). For Wall. Cat. 7170, the K Herbarium has at least two sheets (K000950023 & K001126819), and Wood’s inadvertent lectotypification did not narrow the typification to a single specimen. We herewith narrow the typification to a single specimen and do the Step II process. Thus K001126819 (digital image!) specimen is selected here as the lectotype.

3. *Phlogacanthus guttatus* (Wall.) Nees in Wall., Pl. Asiat. Rar. 3: 99. 1832. *Justicia guttata* Wall., Pl. Asiat. Rar. 1: 24, t. 28. 1830. Type: Bangladesh: “Incolitmontes Pundua, Bengalae orientali confines, florens initio anni. In horto botanico Calcuttae floret mensibus Decembre et Januario” Sylhet Province: 1825, F. De Silva, Wall. Cat. n. 2431 (lectotype K, barcode K001115926, second specimen from top, selected here, digital image! (Fig. 3); isolectotypes, K, barcode K001115926, uppermost specimen and lower most specimen, digital image!; CAL!, barcode CAL0000020026!; E, barcode E00273555, digital image!; K, barcode K000950010, digital image!; P, barcode P00719589, digital image!)

Notes: For his *Justicia guttata* (1830: 24), Wallich cited the locality and its cultivation at the Calcutta Botanical garden, but did not mention the collector’s name. This species name was initially associated with Wallich’s Cat. No. “2430”. Nees (1832) transferred *Justicia guttata* to *Phlogacanthus* and made the new combination *P. guttatus* (1832: 99), and elaborated on the collection (as “Incolit montes Pundua, Bengalae orientali confines, florens initio anni. In horto botanico Calcuttae floret mensibus Decembre et Januario (Wallich.) In montibus provinciae Sillet [Sylhet] legit F. D. [= Francisco De Silva]”) and mentioned “Cat. n. 2431 (2430 errore calami)” (sic). The name “Pundua mountains” is erroneous and often combined with “Silhet mountains” in botanical works which generally refer to “Khasia mountains” (Hooker, 1854). We traced 5 suitable specimens (2 at K, 1 at CAL, P and E each).

Dutta & al. (2016: 474) cited “Type: Bangladesh, Mount Silhet, Wallich, N., #2431, 1830, (E00273555, P00719589)”. Although they cited original materials as the type, they did not inadvertently designate the E or P specimen as the lectotype. This is because, besides citing two herbaria, they did not use the phrase “designated here” or its equivalent as required by Art. 7.10. Consequently, their type citation does not have any nomenclatural standing. The sheet deposited at K contains two specimens (K001115925 (dated Nov 1827) & K001115926 (dated 1825)) and a hand-written note stating the characteristics of the species and showing the date February 1825. The K001115926 specimen is selected here as the lectotype as it has ample foliage and flowering material.

4. *Phlogacanthus jenkinsii* C.B. Clarke in Fl. Brit. India 4 (11): 511. 1884. Type: India: “Assam; Jenkins, — Distrib. Bhamo.” s.d., *Jenkins*, s.n. (lectotype K, barcode K000950015, selected here, digital image! (Fig. 4).

Notes: Although Clarke (1884: 511) cited a single collection (Jenkins s.n.) from Assam, he did mention the distribution range as “Bhamo” (in Myanmar). Therefore, it is evident that the protologue includes uncited collection(s). Within the protologue, Clarke remarked that in spite of the occurrence of 12 ovules in this species, Nees marked it as *Thyrsacanthus indicus* Nees (= *Eranthemum indicum* (Nees) C.B. Clarke, characterized by 4 ovules). We found three specimens deposited at K (K000950014 digital image! K000950015 digital image!, K000950016 digital image!). Of these, the K000950015 specimen was collected by F. Jenkins from Assam, and other two were by anonymous collectors from Assam and from India (s. loc.), respectively. All the three specimens were originally annotated as *Thyrsacanthus indicus*, and subsequently determined as *P. jenkinsii* by C.B. Clarke himself.

Dutta & al. (2016: 474) cited “Type: India, Assam, s. coll., # s.n., 1829, K000950016, K000950014; India, upper Assam, Jenkins, F., #s.n., K000950015”. They cited two different collections for the type of which one does not completely agree with the protologue. Again, in spite of correct citation of K000950015, they did not use the phrase “designated here” or its equivalent as required for lectotypification by Art. 7.10., and thus their citation does not have any nomenclatural standing for typification of this species name. Therefore, the Jenkins specimen with the barcode K000950015, which provides the specific name, is selected here as the lectotype.

5. *Phlogacanthus lambertii* Raizada, Indian For. 60. 535. 1934. Type: India: Uttarakhand: “Baram, Gori Valley, East

Almora at about 2500 feet, 15th Feb., 1920, *W.J. Lambert* 15” (lectotype, DD, Acc. No. 22235, selected here, digital image! (Fig. 5); lectoparatypes: “Pipalkot, Haldwani division, Kumaon at 4500 ft, Mar. 1922, *H.G. Champion* [s.n.]” DD, Acc. No. 26274, digital image!; Uttar Pradesh: “Danda, Haldwani division, U.P., 2800 feet, 22nd Jan., 1927, *A.E. Osmaton*, 1327”; (sic) K, barcode K000950008, digital image!; “Chami, Gori Valley, East Almora division, U.P., 2800 ft, 5th Jan., 1932, *A.E. Osmaton*, 1477” (sic), DD, Acc. No. 58355, 58356, digital image!

Notes: Raizada (1934: 536) cited specimens of four different gatherings made by three different collectors. We traced 5 suitable sheets (4 in DD, 1 in K). On the basis of presence original handwritten notes and all characteristics mentioned by the author in the protologue, specimen collected by Lambert preserved in DD with acc. no. 22235 is selected here as the lectotype.

6. *Phlogacanthus parviflorus* T. Anders. in J. Linn. Soc., Bot. 9: 506. 1867. Type: India: “Hab. In collibus Mishmi, herb. *Griffith!* Kew Distr. n. 6155”, s.d., W. Griffith Herb. Kew Distrib. No., 6155 (lectotype K, barcode K000950017, upper specimen, selected here, digital image! (Fig. 6); isolectotypes K, barcode K000950017, lower specimen, digital image! CAL!, barcode CAL0000020027!)

Notes: Although Anderson (1867: 506) mentioned a single collection (“herb. Griffith! Kew Distr. n. 6155”), he did not use the term type or holotype, and did not mention that the protologue was based on a single specimen. We found three specimens, two at K and one at CAL, each having the Kew Distr. no 6155.

Dutta & al. (2016: 474) cited: “Type: Myanmar, Patkoye Namyoon. s. coll., #s.n., K000950021; India, East Bengal, Griffith W., #6155, P00719592.” Of these two collections the Myanmar specimen was not mentioned in the protologue, and the Indian specimen’s collection locality is different (not agreeing with the protologue). Furthermore, the authors did not use the phrase “designated here” or its equivalent as required for lectotypification by Art. 7.10. Thus, their type citation does not have any nomenclatural standing for typification of this species name.

A sheet at K (barcode K000950017) has two specimens; we herewith select the upper specimen (digital image!) as the lectotype as it is better preserved than other syntypes. A specimen found at CAL! (barcode CAL0000020028!) was erroneously recognized as an isotype though the holotype was not mentioned or indicated in the protologue. One sheet found in P (barcode P00719592, digital image!) which was also designated as type specimen, bears the Kew distribution number 6155 and also collected by

Griffith, differs in collection locality being East Bengal than Mishmi hills which creates a confusion, hence not selected here.

7. *Phlogacanthus pubinervius* T. Anders. in J. Linn. Soc. 9: 508. 1867. Type: Inida: “Hab. In montibus Khasiae in sylvis subtropics, *Simons!*, *Hook. fil. et T. Thoms.!*; in Assam, *Masters!*; Sikkim in sylvis subtropicos, ad altitudinem 5000 ped., *Hook. fil.!*” (India: Sikkim, 5000 ft altitude, s.d. *Hook.f.*, s.n., lectotype, K, barcode K000950012, left-hand specimen, selected here, digital image! (Fig. 7); isolectotypes K barcode K000950012, right-hand specimen, digital image!; CAL! barcode CAL0000020033!; P, barcode P02846695, digital image!; NY barcode 00312245, digital image! U, QRcode U.1044749 digital image!); lectoparatypes, India: Meghalaya: Khasi Mountains: Subtropical forest: s.d., *Simons*, s.n. (CAL! barcode CAL0000020032!; P, barcode P02846694, digital image!); India: Assam: s.d., *Masters*, s.n., (CAL! barcode CAL00020035!); India: Meghalaya: Khasi Mountains: Subtropical forest: s.d., *Hook.f. et T. Thoms.*, s.n (CAL! barcode CAL0000020034!).

Notes: Anderson (1867: 508) described this species on the basis of collections of four gatherings i.e., 1. from subtropical forests of Sikkim, above 5000 ft by J.D. Hooker, 2. from subtropical forests of Khasi mountains by Simons, 3. from Assam by Masters, and 4. From subtropical forests of Khasi mountains by J.D. Hooker and T. Thomson.

Dutta & al. (2016: 474) cited: “Type: India, Sikkim, Hooker, J.D., #s.n., (C10005087, K000950013, NY00312245); Bhutan, Dgiri Hills, Griffith, W., #2422, K0009500013; China, Kouy zcheou, Esquirol, J.H., #737, K000950027”. Of the preceding three collections, except for Hooker’s Sikkim collection, the other two (Bhutan and China) were not mentioned in the protologue. Furthermore, the authors cited three herbaria for Hooker’s collection and did not use the phrase “designated here” or its equivalent as required for lectotypification by Art. 7.10. Thus, their citation does not have any nomenclatural standing for typification of this species name. The specimen deposited at K, barcode K000950012 (digital image!) collected by J.D. Hooker from Sikkim partly (left-hand specimen) is designated as the lectotype here as it is preferred over other syntypes on the account of its better preservation.

DISCUSSION

Typification or linking plant names with a ‘Type Specimen’ is a crucial part of taxonomic studies for proper circumscription of a taxon, was not practiced



Fig. 1: Lectotype of *Justicia curviflora* Wall. (***Phlogacanthus curviflorus*** (Wall.) Nees, K, barcode K001115916, digital image!)
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Fig. 2: Lectotype of *Loxanthus gomezii* Nees (*Phlogacanthus gomezii* (Nees) J.R.I. Wood, K, barcode K001126819, left-hand specimen, digital image!) © The Board of Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew.



Fig. 4: Lectotype of *Phlogacanthus jenkinsii* C.B. Clarke (K, barcode K000950015, digital image!)

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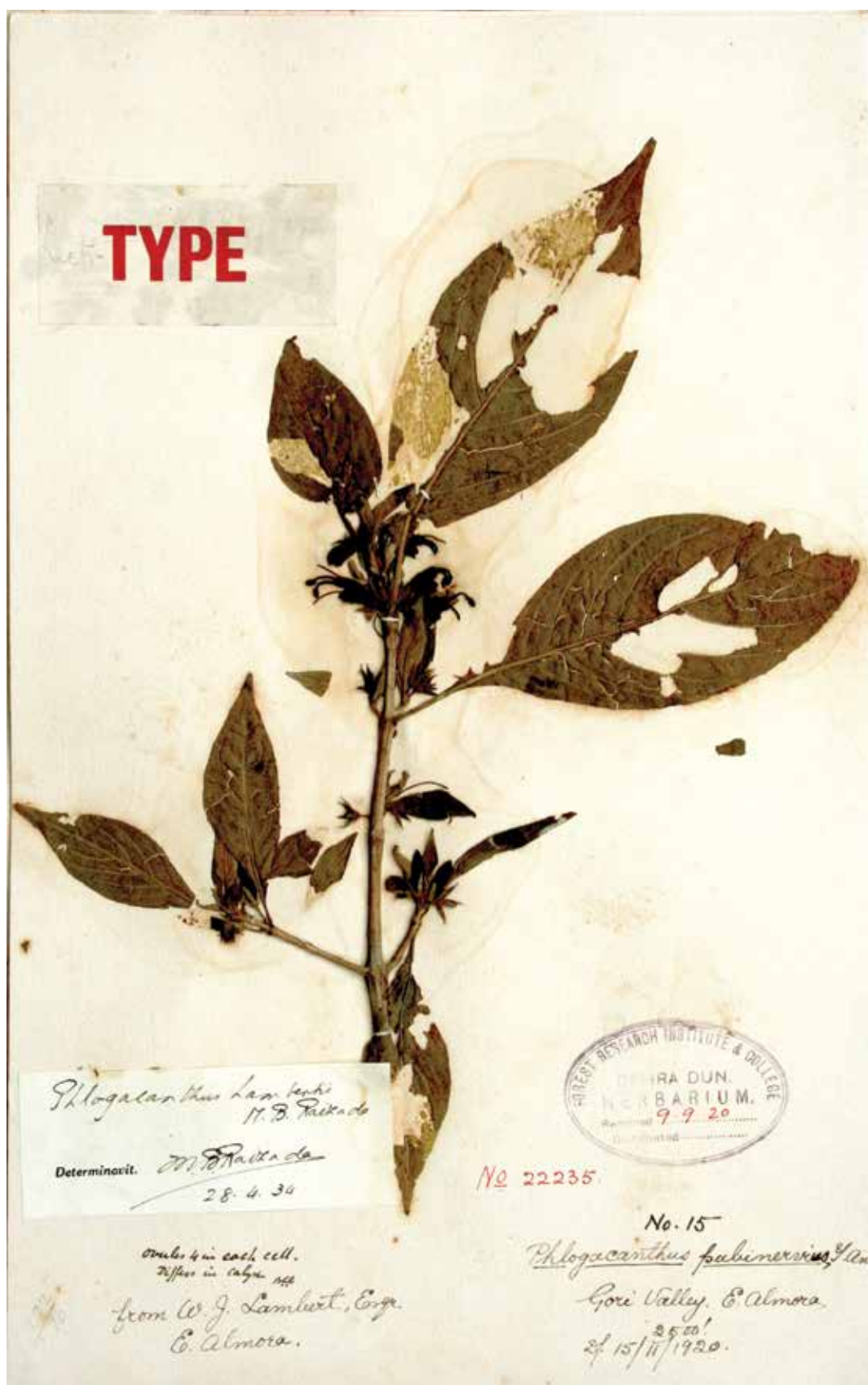


Fig. 5: Lectotype of *Phlogacanthus lambertii* Raizada (DD, acc. no. 22235, digital image!)

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Fig. 6: Lectotype of *Phlogacanthus parviflorus* T. Anders. (K, barcode K000950017, upper specimen, digital image!)

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Fig. 7: Lectotype of *Phlogacanthus pubinervius* T. Anders. (K, barcode K000950012, lefthand specimen, digital image! isolecto-
types K, barcode K000950012, right-hand specimen, digital image!)

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in pre-1st Jan., 1958 era (Art. 40, McNeill & al., 2012) when most of the *Phlogacanthus* species were discovered. Lectotypification of these names are required to comprehend the revisionary account of *Phlogacanthus* Nees from Indian perspective. Consequently, in the present article these lectotypifications are executed in accordance with International Code of Nomenclature for algae, fungi, and plants (Turland & al., 2018).

ACKNOWLEDGEMENTS

Authors are thankful to the Director, Botanical Survey of India for providing necessary facilities and thankfully acknowledging the grant received for this study (project number GBPNI/NMHS-2017-18/LG-03/570 dt. 26/02/2018) under National Mission on Himalayan Studies Scheme by Ministry of Environment, Forest and Climate Change, Government of India, New Delhi. We are also thankful to Dr K.N. Gandhi, Senior Nomenclature Registrar, Harvard University Herbarium for through editing of the manuscript and constructive suggestions. Sincere thanks are given to the directors/curators of following herbaria worldwide viz., ARUN, ASSAM, BM, CAL, DD, E, GZU, K, M, MH, NY, P, U for providing online access to the species concerned accessible for study and furnishing relevant information.

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