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## *Boeica arunachalensis* (Gesneriaceae), a New Species from Indian Eastern Himalaya and Typification of five names in *Boeica*

The genus *Boeica* Clarke contains 16 species and distributed only in tropical Asia (POWO, 2019; Quang *et al.*, 2019). In India, 7 species have been reported so far (POWO, 2019; Taram *et al.*, 2020), of which 3 species are endemic, namely *Boeica clarkei* Hareesh *et al.* (to Arunachal Pradesh), *B. griffithii* Clarke (to Assam) and *B. hirsuta* Clarke (to Assam). During a botanical exploration tour in September 2018 in the foothills of eastern Himalayan state of India, Arunachal Pradesh an unidentifiable and interesting species of *Boeica* was collected from Nirijuli, Papum Pare district at 166 m altitude. Studies on the collected material showed that it is allied to *B. fulva* Clarke. Detailed studies of the herbarium specimens (including types) of all the *Boeica* species of India and adjacent countries, and perusal of relevant literature (Clarke, 1874, 1883 and 1884; Wang *et al.*, 1998; Hilliard, 2001; Sinha and Datta, 2016; Hareesh *et al.*, 2018) proved it to be a new species hitherto unknown to science, which is described here as a novelty.

Further, while working on this genus authors realized the necessity of lectotypification for 5 names *Boeica filiformis* Clarke, *B. fulva* Clarke, *B. griffithii* Clarke, *B. hirsuta* Clarke and *B. porosa* Clarke to fix the identity and to avoid misapplication of names, because no specific herbarium specimen was cited as holotype in protologue of these names and also yet not typified (Clarke, 1883 and 1884; Wang *et al.*, 1998; Hilliard, 2001; Sinha and Datta, 2016). Therefore, lectotypes are chosen for these names and the guidelines and recommendations of the Article 9 of the ICN (Turland *et al.*, 2018) are followed. The taxon *B. filiformis* Clarke var. *griffithii* Datta, Sinha and Chakrabarty is treated here as a new synonym of *B. griffithii* Clarke and the taxonomic identity is also discussed in detail.

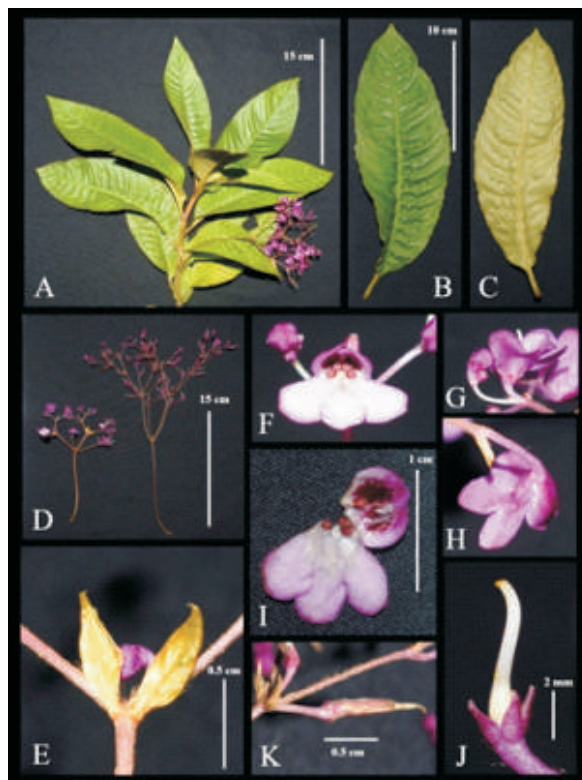
***Boeica arunachalensis*** D. Borah, R.Kr. Singh, M. Taram and A.P. Das, *sp. nov.*

**Type:** India, Arunachal Pradesh, Papum Pare district, Nirijuli, 27°7'16"N and 93°43'54"E, 166 m, 12 Sept. 2018, D. Borah and M. Taram 93 (holotype ASSAM; isotypes ASSAM, ARUN).

The new species is distinguished from its allied species *B. fulva* Clarke in having taller habit 80-120 cm long (vs. 30-60 cm long), leaves becoming brown after drying (vs. dark green after drying), peduncle 13-25 cm long, villous (vs. 6-15 cm long, floccose or glabrescent); calyx lobes 1-1.5 × 0.5-0.8 mm, ovate, equal, glabrous on both sides, pink (vs. 1.5-4 × 0.2-

0.5 mm, unequal, linear-lanceolate, puberulent or villous or tomentose outside, glabrous inside, light greenish-yellow); corolla pink, glabrous on both sides (vs. purple or white, outside puberulent to tomentose, inside glabrous to minutely puberulent); corolla tube 1.5-2 mm long (vs. 2.5-3.5 mm long); midlobe of abaxial lip broadly obovate-suborbicular (vs. oblong-ovate); ovary ovoid (vs. conical to oblong); style 4-5 mm long (vs. 1-2 mm long).

Erect undershrub, decumbent at base. Stem brownish, 80-120cm long; branches villous when young, glabrescent with age; internodes 3-9 cm long. Leaves alternate, becoming brown after drying; petiole 1-1.5 cm long, villous, channelled; lamina elliptic, 14-24 × 5-8 cm, apex acute to shortly acuminate, base attenuate



**Fig. 1:** *Boeica arunachalensis*. A. Upper portion of branch showing leaves and inflorescence, B. Adaxial surface of leaf, C. Abaxial surface of leaf, D. Inflorescence, E. Bracts, F. Front view of flower, G. Side view of flower, H. Back view of flower, I. Split opened corolla showing attachment of stamens, J. Calyx and pistil, K. Capsule.

or cuneate, margins shallowly denticulate, adaxially green, abaxially pale yellowish, glabrous adaxially, abaxially pubescent or tomentose, densely on midrib and veins; lateral veins 16-24 on each side of the midrib, impressed adaxially, prominent abaxially. Inflorescence axillary, pendulous, much branched, panicle of dichasium units, 70-100-flowered; peduncle 13-25 cm long, greenish brown, villous; floral bracts 2, opposite, elliptic-lanceolate, 4-10 × 2-4 mm, apex acute, entire, yellowish brown, both sides villous; pedicels 0.2-0.8 cm long, pinkish, glabrous. Calyx divided to the base, pink; lobes 5, 1-1.5 × 0.5-0.8 mm, ovate, entire, apex acute, glabrous on both sides. Corolla pink to dark pink with dark red throat, 8-10 mm long, glabrous, 2-lipped; tube 1.5-2 mm long; adaxial lip 2-lobed, 3.5-4 × 4.5-5 mm, obovate, apex rounded; abaxial lip 3-lobed, 6.5-8 mm long, apex rounded; lateral lobes elliptic-obovate; midlobe obovate-suborbicular. Stamens 4; filaments 0.8-1 mm long, white, glabrous, adnate to the base of corolla; anthers as long as filaments, brownish-red, dehiscing longitudinally; staminode absent. Disc inconspicuous. Ovary ovoid, pale green, 1.3-1.5 mm long, puberulent; style 4-5 mm long, glabrous, white; stigma 1, truncate, white. Capsule oblong, 1.2-1.4 cm long, greenish-brown, pubescent or tomentose.

**Phenology:** Flowering in late August to late October and fruiting starts in mid September and continued to November.

**Distribution:** Endemic to Papum Pare District of Arunachal Pradesh, India. Currently only known from Nirijuli area.

**Etymology:** The specific epithet refers to the state of Arunachal Pradesh, from where the species was discovered.

**Habitat and Ecology:** The species occurs in shady areas of tropical forests along the banks of streams at an elevation between 160-200 m, association with *Amomum* spp., *Ardisia solanacea* (Poir.) Roxb., *Diplazium esculentum* (Retz.) Sw., *Gonostegia hirta* (Hassk.) Miq., *Henckelia* spp., *Impatiens laevigata* Wall. ex Hook. f. and Thomson, *I. marianae* Van Geert, *I. porrecta* Wall. ex Hook. f. and Thomson, *Peliosanthes teta* subsp. *humilis* (Andrews) Jessop ex Gandhi, *Phrynium pubinerve* Blume, *Pteris* spp., etc.

**Lectotypification**

1. *Boeica filiformis* Clarke, Commelyn. Cyrtandr. Bengal 121, t. 87.1874 and in A. DC. and C. DC., Monogr. Phan. 5: 134.1883 and in Hook.f., Fl. Brit. India 4: 362. 1884.

**Type citation:** "Hab. - In collibus Naga dictis Assamiae superioris. Masters. In Bengalia orientali (versosimiliter Assamia superiore) Griffith. Vidi specimina sicca spontanea".

**Lectotype (designated here):** India, East Bengal, upper Assam, 1839, Griffith 3841/1 (P03552809!; isolectotypes K000858436!, K000858438!, L2825526!).

**Distribution:** India (Northeast India) and Bangladesh.

**Notes:** Clarke (1874) described *Boeica filiformis* based on the collections of Griffith and Masters from Assam, India. In keeping with the practice of those times, Clarke did not designate a holotype nor did he mention the name of the herbarium where the specimens were housed. Four herbarium sheets of Griffith from Assam were traced, two at K (K000858436 and K000858438) and one each at L (L2825526) and P (P03552809). Of these, the specimen at P (P03552809) is better preserve and is therefore chosen here as the lectotype. The specimens of Masters from Assam were not traceable, because may not extant now.

2. *Boeica fulva* Clarke, Commelyn. Cyrtandr. Bengal 119, t. 85.1874 and in A. DC. and C. D.C., Monogr. Phan. 5: 135. 1883 and in Hook.f., Fl. Brit. India 4: 362. 1884.

**Type citation:** "Hab. In Assam; collegit Masters. Vidi specimina sicca spontanea".

**Lectotype (designated here):** India, Assam, s.d., Masters s.n. (CAL0000019264!; isolectotype L2825529!).

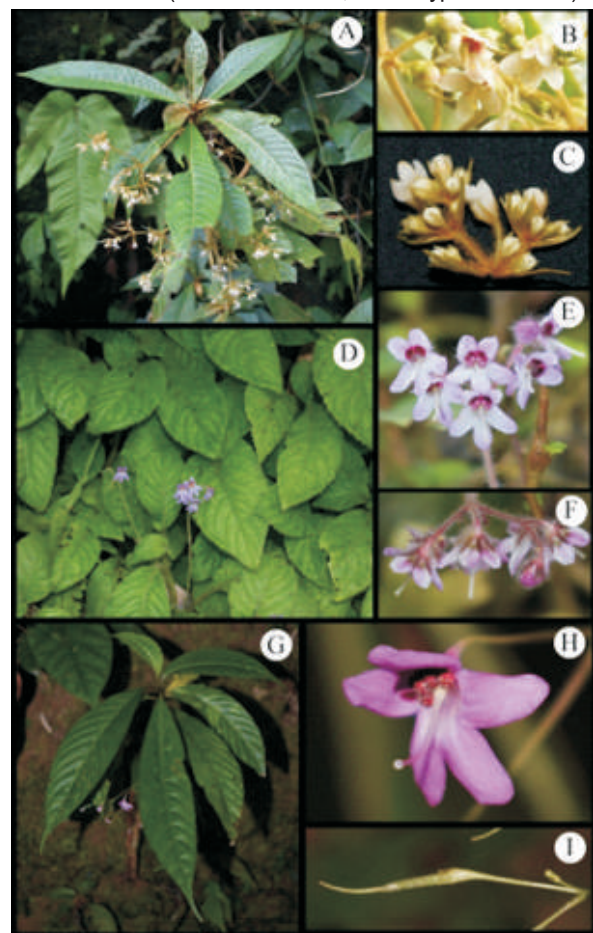


Fig. 2: *Boeica fulva* C.B. Clarke (A-C), *Boeica clarkei* Hareesh et al., (D-F), *Boeica filiformis* C.B. Clarke (G-I).



**Distribution:** China, Bhutan and India (Northeast India).

**Notes:** *Boeica fulva* was described by Clarke (1874) based on the specimens collected by Masters from Assam, India. Presently, two specimens of *B. fulva* collected by Masters from Assam, India are extant, one each at CAL (CAL0000019264) and L (L2825529). The better preserved specimen CAL0000019264, is designated here as the lectotype. Clarke in *Monographiae Phanerogamarum* (1883) cited that the specimen/s of *B. fulva* collected by Masters is/are at K herbarium, but presently no specimen found at K.

Datta *et al.* (2014) cited the type information for *Boeica fulva* Clarke as "Type: INDIA, Assam, Masters s.n. (CAL0000019264, herb. acc. no. 333200)". Although, they cited CAL housing the type specimen, but their citation of type cannot be corrected to lectotype as per Article 9.23 of ICN (Turland *et al.*, 2018), which state that 'On or after 1 January 2001, lectotypification, neotypification, or epitypification of a name of a species or infraspecific taxon is not effected unless indicated by use of the term "lectotypus", "neotypus", or "epitypus", its abbreviation, or its equivalent in a modern language'. They also did not mention the phrase, "designated here" or an equivalent according to Article 7.11 (Singh, 2016).

3. *Boeica griffithii* Clarke, Commelyn. *Cyrtandr. Bengal* 120, t. 86. 1874 and in A. DC. and C. DC., *Monogr. Phan.* 5: 135. 1883 and in Hook.f., *Fl. Brit. India* 4: 362. 1884.

**Type citation:** "In Himalaya orientali" Griffith (versosimiliter in Assam superiore.) Vidi specimina sicca spontanea".

**Lectotype (designated here):** "Illustration" Clarke, Commelyn. *Cyrtandr. Bengal* t. 86. 1874.

**Epitype (designated here):** India, Assam, Goalpara, 19 Aug. 1808, Buchanan-Hamilton 1374 (E00259747!; isoeotypes K000858443!, K001132187!).

*Boeica filiformis* Clarke var. *griffithii* Datta, Sinha and Chakrabarty in *J. Econ. Taxon. Bot.* 38: 240. 2014, *syn. nov.*

**Holotype:** India, Assam, Goalpara, 19 Aug. 1808, Buchanan-Hamilton 1374 (K000858443!; isotypes E00259747!, K001132187!).

**Paratypes:** India, Brahmaputra plains, s.d., Kurz s.n. (CAL, Accession number 333203 and 333204).

**Distribution:** Endemic to India (Assam), not collected after W.S. Kurz (1834-1878), specimens without collection date are housed at CAL (Accession number 333203 and 333204).

**Notes:** *Boeica griffithii* is closely allied with *B. filiformis* and also shows some morphological

similarities with *B. fulva*. It is connecting link between *B. fulva* to *B. filiformis* and comes in between. Clarke (1874) described *B. griffithii* based on the specimen/s collected by Griffith from Assam Himalaya, India. Presently, no original specimen of *B. griffithii* is extant at BR, CAL, K, L and P. Therefore, the illustration 86 provided by Clarke in the protologue, is the only remaining original material and is therefore chosen here as the lectotype. The illustration 86 is moderately adequate to recognize *B. griffithii* because it lacks the detail structure of flower, fruit and indumentum nature of plant. Thus, for precise identification the specimen E00259747, collected by Buchanan-Hamilton from Assam, India is chosen here as the epitype for the name *B. griffithii* Clarke to serve as an interpretative type material, because this specimen clearly depicts the taxon as recognized today. The collection of Buchanan-Hamilton from Assam, India was cited by Clarke in his later work in the year 1883, where he described *B. griffithii* in detail. He also cited the same collection of Buchanan-Hamilton from Assam, India in *Flora of British India* (1884) for *B. griffithii*. In both of these later works Clarke did not cite the collection of Griffith from Assam Himalaya, India, which was cited by him in the protologue of *B. griffithii*. This suggests that the type specimen/s of *B. griffithii* may be perished and was not available to Clarke during his later works in the year 1883 and 1884.

Datta *et al.* (2014) cited the type information for *Boeica griffithii* Clarke as "Type: East Himalay, Griffith, KD 3844 (CAL, Herb. acc. no. 333199)". Here also in doing so, they have not done effective lectotypification, as mentioned above under *B. fulva*. They treated *B. griffithii* as a synonym of *B. fulva* in citation part of their work, because according to them the type specimen (Griffith 3844 at CAL) of *B. griffithii* is matching with *B. fulva*. In the introduction part of their work they mentioned "In the light of the above findings the species *B. griffithii* is reduced to a synonym of *B. filiformis*", but after study of their entire article it is clear that they want to treat *B. griffithii* as a synonym of *B. fulva*. However, the specimens of Griffith' collection number 3844 collected from Bhutan and Mishmi hills (in Arunachal Pradesh), India belongs to *B. fulva*, cited by Clarke in his later work in *Monographiae Phanerogamarum* (1883) and *Flora of British India* (1884). Datta *et al.* (2014) mentioned that the specimen from East Himalaya of Griffith 3844 at CAL is identified as *B. griffithii* by Clarke, but their interpretation is wrong because on this sheet Clarke has not annotated *B. griffithii*, but it is annotated by some anonymous later worker, alike on sheet at K (K000858441). Four herbarium sheets of Griffith 3844 were traced (CAL with accession no. 333199, K000858440, K000858441 and P03552811) and except CAL sheet all were annotated as *B. fulva* by Clarke.

Datta *et al.* (2014) described *Boeica filiformis* var. *griffithii* based on the collection of Buchanan-Hamilton

from Assam, India and of Kurz from Brahmaputra plains, India. Detail study and above points clear that Datta *et al.*, misunderstood the type of *B. griffithii* and so unwantedly described new taxon based on collection of Buchanan-Hamilton and Kurz. The name *B. griffithii* Clarke is typified here and now the identity is fixed. Type specimens of *B. filiformis* var. *griffithii* are impeccably matching with the type specimens of *B. griffithii* and also the description of former comes within the range of later. Therefore, *B. filiformis* var. *griffithii* is treated here a new synonym of *B. griffithii*.

4. ***Boeica hirsuta*** Clarke in A. DC. and C. DC., Monogr. Phan. 5: 136. 1883 and in Hook.f., Fl. Brit. India 4: 362. 1884.

**Type citation:** "India boreali-orientalis; in ripis fluminis Soondra (in Assam superior?) (in h. Kew sine nomine lectoris)".

**Lectotype (designated here):** India, Assam, Soondra banks, Oct. 1845, Anon. s.n. (upper specimen of K000858444!; isolectotype lower specimen of K000858444!).

**Distribution:** Endemic to India (Assam), not collected after type collection.

**Notes:** Pertaining to the type specification given in protologue of *Boeica hirsuta* Clarke (1883), one herbarium sheet was traced at K (K000858444). This sheet contains two specimens, one on upper side and other on lower side. The upper specimen of herbarium sheet K000858444 is better preserve and is designated here as the lectotype.

5. ***Boeica porosa*** Clarke in A. DC. and C. DC., Monogr. Phan. 5: 136. 1883.

**Type citation:** "Burma superior; in convalle Hookhoong, in ripisfluminis Magoung (Griffith, n. 3848, in hh. Kew, Paris)".

**Lectotype (designated here):** Burma, Hookhoong valley (Hukaung), 28 March 1837, Griffith 3848 (middle specimen of K000858445!; isolectotypes left and right side specimen of K000858445!, K000858446!, P03552806!).

**Distribution:** China, Myanmar, Vietnam and India (Assam).

**Notes:** Clarke (1883) described *Boeica porosa* based on the collections of Griffith from Burma. Three original herbarium sheets of *B. porosa* collected by Griffith from Burma were traced, two at

K (K000858445 and K000858446) and one at P (P03552806). The better preserve middle specimen of K000858445, is designated here as the lectotype. The illustration 't. 435' given by Griffith in *Icones plantarum asiaticarum* (1854) is also original material of the name *B. porosa* Clarke.

## References

- Clarke C.B. (1874). *Commelynaceae et Cyrtandraceae Bengalenses*. Thacker, Spink and Co., Calcutta.
- Clarke C.B. (1883). *Boeica*. In: *Monographiae phanerogamarum*. Vol. 5 (A. DC. and C. DC. eds.). G. Masson, Paris.
- Clarke C.B. (1884). *Boeica*. In: *Flora of British India*. Vol. 4 (Hooker J.D. ed.) L. Reeve and Co., London.
- Datta S., Chakrabarty T. and Sinha B.K. (2014). A note on the status of *Boeica griffithii* C.B. Clarke (Gesneriaceae). *J. Econ. Taxon. Bot.*, **38** (2): 237-240.
- Griffith W. (1854). *Icones Plantarum Asiaticarum*. Vol. 4. A.B. Coshan, Calcutta.
- Hareesh V.S., Wu L., Joe A. and Sabu M. (2018). *Boeica clarkeisp. nov.* (Gesneriaceae) from northeastern India. *Nordic J. Bot.*, **36**(4): e01551.
- Hilliard O.M. (2001). Gesneriaceae. In: *Flora of Bhutan*. Vol 2 (Grierson A.J.C. and Long D.G. eds.) Royal Botanic Garden, Edinburgh.
- POWO (2019). *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. Retrieved from: <http://www.plantsoftheworldonline.org/> (accessed 7 Dec. 2019).
- Quang B.H., Hai D.V., Khang N.S., Linh L.T.M., Binh T.D., Son D.H., Anh T.T.P. and Möller M. (2019). *Boeica konchurangensis* sp. nov. (Gesneriaceae) from Gia Lai plateau, Vietnam. *Nordic J. Bot.*, **37** (5): e02333.
- Singh R.K. (2016). Proposal to add a new example to illustrate Article 7.10 and Article 9.23. *Taxon*, **65**(2): 407-408.
- Sinha B.K. and Datta S. (2016). Taxonomic account on the family Gesneriaceae in Northeast India. *Nelumbo*, **58**: 123.
- Taram M., Borah D. and Nampy S. (2020). *Boeica multinervia* K.Y. Pan (Gesneriaceae): a new record for India. *Check List*, **16**(1): 89-92.
- Turland N.J., Wiersma J.H., Barrie F.R., Greuter W., Hawksworth D.L., Herendeen P.S., Knapp S., Kusber W.-H., Li D.-Z., Marhold K., May T.W., McNeill J., Monro A.M., Prado J., Price M.J. and Smith G.F. (2018). *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code)*. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten.
- Wang W., Pan K., Li Z., Weitzman A.L. and Skog L.E. (1998). Gesneriaceae. In: *Flora of China*. Vol. 18 (Wu Z.Y. and Raven P.H. eds.), Science Press, Beijing and Missouri Botanical Garden Press, St. Louis.

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