

## Taxonomy of *Barleria morrisiana* E. Barnes & C. E. C. Fisch. (Acanthaceae), a little-known species of the Biligiri Ranganathaswamy Temple Tiger Reserve, Karnataka, India

*Barleria* L. (Acanthaceae Juss.) with ca. 285 species found in Africa and Asia has the highest diversity in tropical eastern and southern Africa<sup>1</sup>. It is divided into two subgenera, namely *Barleria* and *Prionitis* (Nees) Lindau<sup>2</sup>. Both are represented in India by 32 taxa (30 species, one subspecies and one variety)<sup>3</sup>. The subgenus *Barleria* dominates with 20 species.

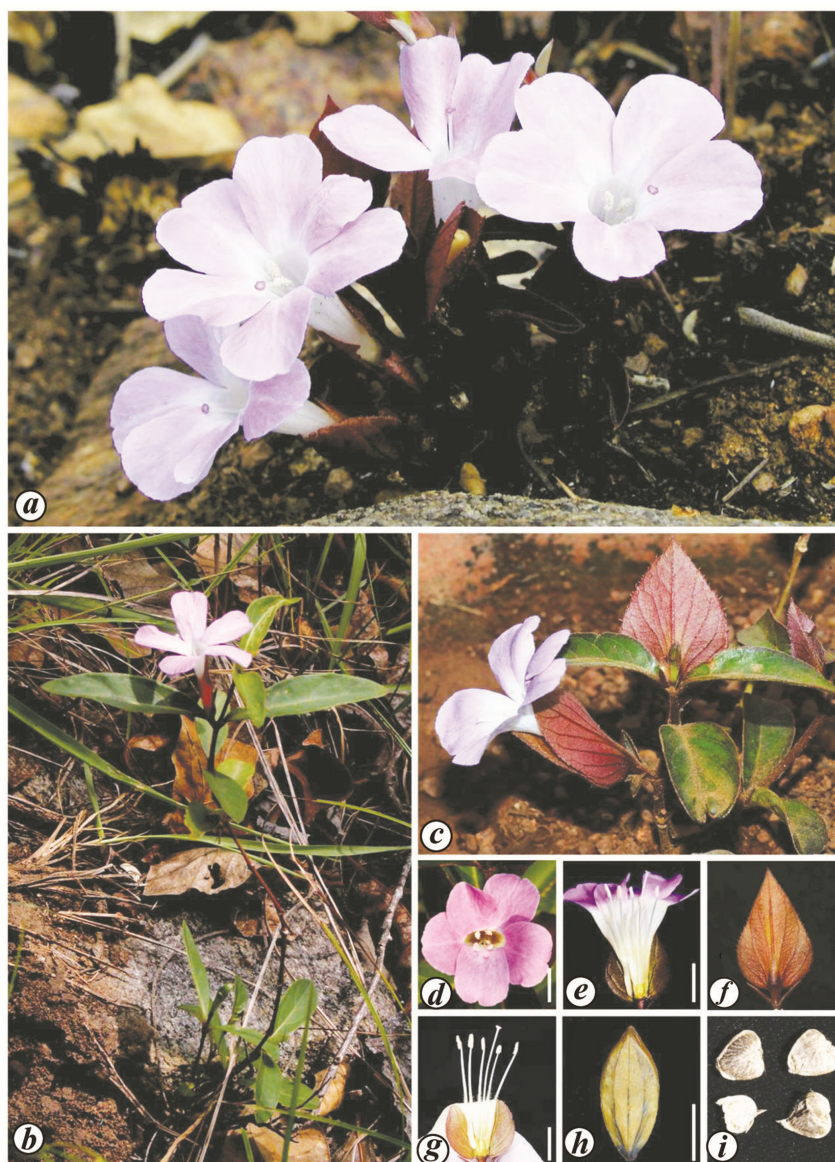
As a part of morphotaxonomical and cytogenetical studies on *Barleria* in India<sup>3–5</sup>, we collected some specimens from the Biligiri Ranganathaswamy Temple (BRT) Tiger Reserve Hills (11°54.240'N, 077°06.526'E, elevation 3100 ft), Karnataka, India in June 2018. The specimens were identified as *Barleria morrisiana* E. Barnes & C. E. C. Fisch., an endemic species of the Western Ghats. The species was earlier treated as a synonym of *Barleria montana* Nees by Shendage and Yadav<sup>6</sup>. Its identity is deliberated with description and photographs. The name '*Barleria morrisiana*' is lectotypified.

**Taxonomy.** *Barleria morrisiana* E. Barnes & C. E. C. Fisch., Bull. Misc. Inform. Kew 1939 (10): 659, 1940. Type: Near Punjur, Biligirirangana Hills, Mysore (now Karnataka) State (as given in protologue) (South India is mentioned in pencil on specimens); 3000–3500 ft, June 1939, *Barnes* 2155 (lecto K000797800, designated here, K!); syntypes: 22 April 1939, *Barnes* 2122 (K000797799!); May 1939, *Barnes* 2166 (K000797801!).

Perennial undershrubs, 15–35 cm high; roots wiry; stem thickened at base, branches reddish-brown, appressed-hispid; nodes swollen; node and petiole with cupular glands. Leaves 4.4–6.7 × 1.7–2.7 cm; lamina elliptic or oblanceolate; base cuneate; apex acute or obtuse, margins entire, green above, glaucous beneath, epidermal cells with cystoliths imparting rough texture to dried specimen; margin and nerves ciliate; midrib prominent, lateral nerves 4–5 pairs; petioles 1–3 mm long, reddish-brown, sparsely appressed-hispid. Flowers axillary, solitary; 3.5–4.2 cm long, pink. Pedicels 3–7 mm long, sparsely appressed-hairy. Bracteoles two, attached above middle of the pedicel, one slightly larger than other,

8–12 × 1.5–3 mm, sparsely hispid, linear-lanceolate, ciliate. Calyx of four dissimilar lobes, two outer and two inner; outer abaxial lobe 2.1–2.4 × 1.4–1.8 cm, ovate, acute to obtuse, apex split into two teeth; outer adaxial lobe 2.2–2.4 × 1.4–1.8 cm, ovate, acute, strigose on both surfaces, reddish-brown outside, greenish-red inside; texture rough; margins spinulose-ciliate; venation conspi-

cuous, red, 8–11 main veins from the base; secondary and tertiary veins visible when young; inner calyx lobes 9–18 × 2–2.5 mm, linear-lanceolate, apex very narrowly acute, strigose on both surfaces and with scattered glandular hairs inside, white, 4–5 main veins from the base. Corolla infundibuliform, pink, five-lobed, lobes more or less similar in size and shape, 1.5–1.8 × 1.1–1.2 cm, obovate;



**Figure 1.** *Barleria morrisiana*: (a–c) Habit. **a**, Flowering after first shower; **b**, during rainy season; **c**, under cultivation; **d**, Corolla top view; **e**, corolla split open; **f**, outer calyx lobe; **g**, anthers and style; **h**, unopened capsule; **i**, seeds. (d–i, scale bar = 1 cm).

apex rounded or retuse. Stamens five, all fertile, attached at 7–8 mm from the base of corolla, 2.1–2.5 cm long, one distinctly shorter, included, remaining four at the mouth of tube, of which one pair slightly longer than other; anthers ca. 2–3 mm long, pink, basifixed, dehiscence longitudinal, introrse; filaments hairy at base. Ovary two-locular, glabrous; ovules four; disc cupular, enclosing ovary for one-fourth of its length; style 2.8–3.2 cm long, glabrous except near the base, slender; stigma capitate-discoid. Capsule glabrous, acute at both ends, 2–2.2 × 0.7–0.8 cm, green when young, brown at maturity, dehiscing explosively. Seeds brown, broadly ovate or suborbicular, 6–8 mm long, hygroscopic hairy (Figure 1).

**Typification.** In 1939, Barnes and Fischer<sup>7</sup> described *B. morrisiana* based on the collection from Biligirirangana Hills near Punajur ('Punjur'), 3000–3500 ft high. They collected five specimens, viz. Barnes 2121, 2122, 2148, 2155 and 2166 that are housed at Kew, UK. Among these, three specimens (Barnes 2122, 2155 and 2166) mentioned in the protologue were collected from the same locality on different dates and none of them had duplicates. Barnes and Fischer did not designate any holotype in the protologue.

The specimens, viz. Barnes 2122, 2155 and 2166 constitute syntypes. We have selected Barnes 2155 as a lectotype here. The given specimen has dissected flowers and tallies with the characters in the protologue such as leaves oblong to elliptic or oblanceolate, flowers axillary solitary with pedicel and the position of anther.

**Identity and affinities.** Sharma *et al.*<sup>8</sup> listed *B. morrisiana* as a distinct species on the basis of original publication and mentioned that they did not see any specimens. Shendage and Yadav<sup>6</sup> treated *B. morrisiana* as a synonym of *B. montana*. Although the species resembles *B. montana* in its habit, it is completely different in morphology. Barnes and Fischer compared this species with *Barleria lawii* T. Anderson and *Barleria pilosa* B. Heyne ex Nees because of similarity in the shape (broadly ovate) of the outer sepals and presence of solitary flower. They mentioned that the size of the outer sepals is much less in *B. morrisiana*. Also the shape (narrowly oblanceolate to elliptic) of the leaf and glabrous abaxial

surface differentiate it from the aforementioned species. A critical examination of the herbarium specimens housed at K (Barnes 2121, 2122, 2148, 2155 and 2166), MH (Hosagoudar 96803) and our own collection (Lekhak *et al.* 552), and observations of live specimens revealed that the species is distinct and has been wrongly treated as a synonym of *B. montana* by Shendage and Yadav<sup>6</sup>.

**Phenology.** Flowering and fruiting: April to June and later. Flowering and fruiting also observed during December to March under cultivation and after regular watering.

**Ecology and distribution.** *B. morrisiana* is found on dry stony hills which are in the rainshadow area of Nilgiri mountains at an altitude of 3000–3500 ft. It is largely distributed on the west-facing slopes of BRT Tiger Reserve and Sathyamangalam Tiger Reserve which receive rainfall from the clouds crossing over the Nilgiri mountains during the southwest monsoon. The plant flowers following the SW monsoon showers, especially in those areas where the undergrowth is burnt during forest fires. Unlike other species in the genus, *B. morrisiana* flowers following summer showers and during the SW monsoon. It is found in the scrub forests dominated by stunted trees of *Terminalia anogeisiana* Gere & Boatwr., *Phyllanthus indofischeri* Bennet, and *Strychnos potatorum* L.f. in association *Lepidagathis cristata* Willd., *Tephrosia calophylla* Bedd., *Andrographis serpyllifolia* (Vahl) Wight, *Sopubia trifida* Buch.-Ham. ex D. Don, *Leucas hirta* (B. Heyne ex Roth) Spreng. and *Crotalaria filipes* Benth. The species is so far known only from BRT Tiger Reserve.

Additional specimens examined: INDIA, Karnataka, Chamarajanagar district, Punajur ghat (Punjur), 22 April 1939, Barnes 2121 (K!); May 1939, Barnes 2148 (K!); Biligirirangana Hills, 26 June 1991, V.B. Hosagoudar 96803 (MH!); 12 June 2018, Lekhak *et al.* 552 (SUK!).

**Taxonomic notes.** *Barleria* species show wide variation in the androecium<sup>9</sup>. Most of the species have two fertile stamens. *B. morrisiana* is unique in having all the five stamens fertile (Figure 1). *Barleria ovata* E. Mey. ex Nees, a South African species has four fertile stamens with the fifth one represented by a filament without antherode. Similarly,

*Barleria deserticola* I. Darbysh. & E. A. Tripp, a species endemic to southwestern Angola exhibits didynamous stamens and a much reduced staminode. *B. morrisiana* is an elegant, narrow endemic restricted to BRT Tiger Reserve and requires focused studies for understanding its distribution range and threats to its existence, if any.

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