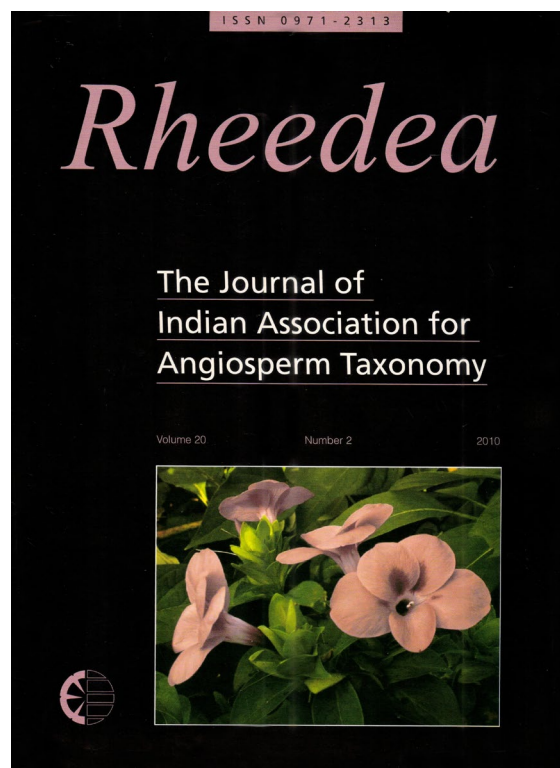




## Revision of the Genus *Barleria* (Acanthaceae) in India

Shankar M. Shendage & S.R. Yadav



How to cite:

**Shendage S.M. & S.R. Yadav 2010.** Revision of the Genus *Barleria* (Acanthaceae) in India. *Rheedeia* 20(2): 81-130.

<https://dx.doi.org/10.22244/rheedeia.2010.20.02.04>

*Received:* 30.12.2009

*Revised and accepted:* 10.12.2010

*Published in print:* 31.12.2010

*Published Online:* 31.12.2010

# Revision of the Genus *Barleria* (Acanthaceae) in India

Shankar M. Shendage\* and S.R. Yadav

Department of Botany, Shivaji University, Kolhapur – 416 004, Maharashtra, India.

\*E-mail: shankar\_ms24@rediffmail.com

## Abstract

The genus *Barleria* L. consists of 28 taxa including 26 species, one subspecies and one variety in India, is revised. Detailed descriptions for all the taxa and illustrations for 19 species have been provided along with keys for identification of subgeneric, specific and infraspecific taxa.

**Keywords:** Acanthaceae, *Barleria*, India, Revision

## Introduction

The genus *Barleria* was dealt by Linnaeus (1753) on the basis of specimens collected from India. It is a pantropical but predominantly an Old World genus, with its greatest centre of species diversity in tropical East Africa, followed by South Africa and Asia (Balkwill & Balkwill, 1998). It is the third largest genus in the family Acanthaceae with c. 300 species (Balkwill & Balkwill, 1997; Mabberley, 2008). Balkwill & Balkwill (1997) reported 32 species from India. Whereas Karthikeyan *et al.* (2009) enumerated 29 species, one subspecies and six varieties. The present work recognises 26 species, one subspecies and one variety in India.

Nees (1847) provided the first comprehensive account on *Barleria*. The genus has also been studied in detail for India and Indian subcontinent by many researchers: Nees (1832, 1847), Oberstedt (1854), Anderson (1864, 1867), Bentham (1876), Clarke (1885, 1901), Lindau (1895), Burkill & Clarke (1899), Ridley (1923), Obermeijer (1933), Bremekamp (1965), Benoist (1967) and Scotland & Vollesen (2000). Bentham (1876) was the first to organise assemblage of variable species of this genus into natural groups.

*Barleria* can be easily distinguished from other genera of Acanthaceae by a combination of three characters: Calyx 4-partite with 2 large outer segments and 2 smaller inner ones, spheroidal, honey-combed pollen grains and the predominance of double cystoliths (calcium oxalate crystals) in the epidermal cells.

Balkwill & Balkwill (1997) classified *Barleria* into 2 subgenera, viz., *Barleria* (consisting 2 sections, *Barleria* and *Chrysothrix*) and *Prionitis* (consisting

5 sections, *Prionitis*, *Somalia*, *Caviostrata*, *Fassimura* and *Stellatohirta*). Of the 7 sections of *Barleria*, 5 are reported from India. In India, section *Barleria* is represented by 9 species of which 4 are endemic and section *Chrysothrix* by 9 species of which 6 are endemic. The subgenus *Prionitis* is represented by 3 sections in India of which section *Prionitis* is represented by 4 species that includes an endemic; section *Somalia* by 2 species with an endemic and section *Caviostrata* by 4 endemic species.

## Materials and Methods

The specimens for the study were collected through extensive field studies in different parts of India. In addition, herbarium specimens from CAL, MH, BSI, BLAT, KFRI, SUK, BAMU, FRLH and also from the herbaria of ATREE and Goa University were examined. Identification was confirmed after consulting types and protologues. Cibachromes or microfiches of certain type specimens were obtained from K, P, LINN and NYBG for study. Illustrations were made from live specimens. Except *Barleria hochstteri*, *B. pilosa*, *B. stocksii* and *B. vestita* all the other species are being maintained as live collections in the botanic garden of Shivaji University, Kolhapur.

Morphological characters of all the specimens were studied critically. Nomenclature is followed as per the Vienna Code (McNeill *et al.*, 2006). Vernacular names are provided based on published literature. Herbarium specimens were prepared following Forman & Bridson (1989). The specimens are deposited at SUK.

**Barleria** L., nom. cons.

**Barleria** L., Sp. Pl.: 636. 1753 & Gen. Pl.: 785. 1764; Nees in de Candolle, Prodr. 11: 222. 1847; Bentham & Hooker, Gen. Pl. 2: 1091. 1876; Clarke in Hooker, Fl. Brit. India 4: 482. 1884; Lindau in Engler & Prantl, Pflanzanfam. IV(3b): 313. 1895; Cooke, Fl. Bombay 2: 456. 1904; Gamble, Fl. Madras 2: 734. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 56. 1952; Balkwill & Balkwill, Kew Bull. 55: 513. 1997; Karthikeyan *et al.*, Fl. Pl. India –Dicotyl. 1: 5. 2009.

Type: *Barleria cristata* L. (Lectotype: Brummitt & Vollesen, 1992; Jarvis *et al.*, 1993).

*Barleriacanthus* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn: 24. 1854.

Type: *Barleria acanthoides* Vahl.

*Barlerianthus* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn: 24. 1854.

Type: *Barleria grandis* Nees

*Barleriosiphon* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn: 21. 1854.

Type: *Barleria longiflora* L.f.

*Dicranacanthus* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn: 21. 1854.

Type: *Barleria buxifolia* L. (Lectotype: Balkwill & Balkwill, 1997).

Herbs or shrubs, suffrutescent, with or without axillary thorns. Leaves simple, decussate, entire; epidermal cells dense, usually lineolate, with paired cystoliths. Flowers in cymes or solitary, axillary or terminal; cymes monochasial, dichasial or combined monochasial and dichasial branching. Bracts variously shaped, entire or toothed at margins, foliaceous or highly modified and reduced to spines, coriaceous or membranous. Bracteoles 2, subequal or rarely conspicuously dimorphic; usually on one side of inflorescence axis due to displacement, leaf-like, coriaceous or variously dentate or spinescent at margins, rarely completely reduced to a solid, cylindrical spine. Calyx 4-lobed, 2-partite; lobes entire, dentate or spinescent at margins; outer lobes subequal, much larger than inner lobes, with 3 or more prominent veins from the base, often prominently reticulate; shape, colour and vestiture of lobes variable. Corolla subactinomorphic to strongly bilipped, tubular below, spreading towards apex, usually showy, white, pink, lilac, purple, scarlet, blue, yellow or orange, sometimes with blotches; tube divided into lower and upper portions at point of insertion of stamens; lower tube usually narrowly cylindrical; upper tube either

narrow or variously widened; lobes 5, either  $\frac{2}{3}$  or  $\frac{1}{4}$ ; median abaxial lobe usually incised deeply than other lobes. Stamens 2 or 4, epipetalous; 2 median abaxial stamens always fertile, usually exerted or at least conspicuously longer than other stamens; out of 3 adaxial stamens, 2 usually sterile; central one reduced to staminode or occasionally absent; filaments usually hirsute at the point of insertion, twisted through 180° and crossing over near base; anthers of fertile stamens 2-lobed; lobes parallel, muticous, longitudinally dehiscent; staminodes with or without anther lobes. Pollen spheroidal; exine deeply honey-combed. Disc cupular, covering less than  $\frac{1}{4}$  to  $\frac{1}{2}$  of ovary base. Ovary 2-loculed; ovules 2 or 1 in each locule, often one ovule reduced or aborted; style terete, glabrous or with varied vestiture at base; stigma 1 or 2-lobed; lobes subconfluent, capitate or discoid or filiform when 1-lobed. Fruit a loculicidal capsule, either compressed-quadrangular, obtrulloid or ellipsoid, with or without an apical beak, 2-loculed. Seeds 2 or 4, usually discoid, flattened on one side, rarely subglobose or oblongoid, asymmetrical above the hilum, covered with hygroscopic hairs of various appearances or glabrous, supported by retinacula.

**Key to the subgenera**

1. Seeds usually 2 ..... Subgen. **Prionitis** p.p.
1. Seeds usually 4 ..... 2
2. Capsules with a hollow apical beak .....  
..... Subgen. **Prionitis** p.p.
2. Capsules without an apical beak .....  
..... Subgen. **Barleria**

**Subgenus: Barleria****Key to the sections**

1. Leaves usually with a sharp apicula; inflorescence axillary ..... Sect. **Barleria**
1. Leaves without a sharp apicula; inflorescence terminal ..... Sect. **Chrysothrix**

**Section: Barleria****Key to the species**

1. Plants armed; leaves spinescent at apex ..... 2
1. Plants unarmed; leaves not spinescent at apex .. 5
2. Bracts spinescent at apex ..... 3
2. Bracts spinescent at margins ..... 4
3. Plants glandular-hairy; flowers pedicelled, pink; outer sepals linear-lanceolate, entire, twice longer than inner ones ..... **B. mysorensis**

3. Plants not glandular-hairy; flowers sessile, white or sky blue; outer sepals broadly ovate, dentate, four times longer than inner ones ... **B. buxifolia**
4. Flowers sessile; corolla 3.5 – 4.5 cm long ..... **B. noctiflora**
4. Flowers shortly pedicelled; corolla 6 – 8 cm long ..... **B. acanthoides**
5. Outer sepals dentate ..... 6
5. Outer sepals entire ..... 7
6. Flowers in dense cymes, pink, violet or white; outer sepals lanceolate ..... **B. cristata**
6. Flowers solitary, sky blue; outer sepals ovate ..... **B. pilosa**
7. Herbs, creeping; flowers scarlet ..... **B. repens**
7. Shrubs, erect; flowers white or blue ..... 8
8. Leaves stellate-hairy; outer sepals cordate; corolla 7 – 12 cm long ..... **B. longiflora**
8. Leaves tomentose-hairy; outer sepals linear; corolla 3 – 4 cm long ..... **B. tomentosa**

**Barleria acanthoides** Vahl, Symb. Bot. 1: 47. 1790; Willdenow, Sp. Pl. ed. 4, 3: 378. 1800; Nees in de Candolle, Prodr. 11: 240. 1847; Anderson, J. Linn. Soc., Bot. 9: 490. 1867; Clarke in Hooker, Fl. Brit. India 4: 484. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 336. 1911; Cooke, Fl. Bombay 2: 458. 1904; Duthie, Fl. Gangetic Plain: 69. 1911; Parker, Forest Fl. Punjab: 383. 1973; Bhandari, Fl. Indian Desert: 265, f. 114. 1978; Nair, Rec. Bot. Surv. India 21(1): 199. 1978; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Shetty & Singh, Fl. Rajasthan: 632. 1991; Kumar, Fl. Haryana: 285. 2001; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 5. 2009.

**Fig. 20a**

Type: 'Habitat in Arabia felici'.

*Barleria candida* Nees in de Candolle, Prodr. 11: 240. 1847.

*Barleriacanthus acanthoides* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn: 24. 1855.

*Barleria noctiflora* sensu Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 145. 1850, non L.f. 1782.

Vernacular Names: *Bajardanti*, *Chapari* (Rajasthani).

Undershrubs, perennial, erect, stunted, up to 1 m high, hoary, armed. Stems terete, pubescent. Thorns c. 2 cm long, branch-opposed at each node, often branched. Leaves oblong or obovate, 2 – 4.5 × 1 – 2.5 cm, attenuate at base, ciliate at margins, acute- or obtuse-acuminate-spinescent at apex, hairy; lateral veins 4 or 5 pairs; petioles 5 – 10 mm long, pubescent. Flowers solitary, axillary or in dense,

often leaf-opposed, monochasial scorpioid cymes; pedicels very short; bracts linear to linear-lanceolate, 1 – 2 × 0.5 – 1.5 cm, spinescent at apex, often spinous-branched, pubescent. Outer sepals broadly ovate, subequal, 1 – 1.5 × 0.8 – 1.2 cm, acute-mucronate at apex, pubescent, turning yellowish brown when mature, very conspicuously reticulate-veined; inner sepals linear-lanceolate, 5 – 7 × 1 – 2 mm, ciliate at margins, acute at apex, pubescent. Corolla 6 – 8 cm long, hairy outside, white; tube 5 – 6 cm long, gradually widening towards apex, hairy outside, 5-lobed; lobes ovate, 6 – 10 mm long, acute at apex. Ovary hairy above; ovules 2 in each locule. Capsules ellipsoid, 1 – 1.5 × 0.3 – 0.4 cm, compressed, turgid below, hairy at apex, 4-seeded. Seeds broadly ovate, 4.5 – 5.4 × 3.4 – 3.8 mm, flattened on one side, covered with silky appressed hairs; lower seeds often immature or rudimentary.

*Flowering & Fruiting*: October – March.

*Habitat*: Rocky localities and dry hillslopes.

*Distribution*: World: Djibouti, Egypt, Ethiopia, India, Pakistan, Somalia and Sudan. India: Gujarat, Haryana, Punjab and Rajasthan.

*Specimens examined*: INDIA, **Gujarat**, Kachchh district, Bhuj-Bhujia hill, 1.2.1957, *Jain* 11604; Dhinodhar, 12.4.1960, *Jain* 61903; Wandh-Bhuj, September 1964, *Rao* 103159; Bhuj-Nakhatrana, 14.9.1968, *Raghavan* 114758; Banni, Rudramata, 25.9.1968, *Raghavan* 115162; Dhinodhar, 2.2.1975, *Jain* 11707 (BSI). **Rajasthan**, Barmer district, Barmer, Mataji temple hill, 4.10.1960, *Rolla* 66866; Haldeshwar Mahadev R.F., 15.11.1981 *Pandey* 7996; Jaisalmer district, Pokaran, 10.8.1958, *Jain* 40707; Jaisalmer, 8.9.1959, *Stover* B82 (BSI); Jaisalmer-Ramgarh way 4 mile, 12.10.1962, *Rolla* 67115; Budli nala, 24.8.1964, *Wadhwa* 4991; Kuri-kotari, 7.9.1964, *Wadhwa* 5248; Sootelai tank, Pokaran, 11.11.1973, *Tiwari* 765; Bara Bagh, 12.3.1977, *Shetty* 3498 (CAL); Jaisalmer, 19.11.2005, *Shendage* SMS2516 (SUK); Jodhpur district, Kailana, 18.8.1957, *Puri* 21825; Kayalana hills, 20.8.1957, *Khisti* 23024; Jodhpur-Balsamand, 30.7.1958, *Jain* 40129; Balsamand, 12.3.1959, *Jain* 49307 (BSI); Beriganga GAZRI afforestation area compt. III, 10.2.1972, *Shetty* 177; Kailana Camp II, 31.7.1972, *Moorthy* 36; Near Luni river, along Bilara-Jodhpur Road, 28.2.1977, *Singh* 3540; Balsamand, 6.10.1977, *Singh* 4493; Pali district, Mavawav Pali, 11.8.1958, *Jain* 40934 (BSI); Erinpura-Jawai dam hills, 2.10.1960, *Rolla* 66817; Bisalpura, 29.12.1985, *Pandey* 19453 (CAL).

*Notes*: A very rigid, armed undershrub. It shows considerable variation in shape and size of leaves, bracts and calyx as well as thorn texture. Plants grown in the botanical garden of the Shivaji University



produced seeds apomictically. Plants browsed by goats and camels (Shetty & Singh, 1991).

***Barleria buxifolia* L.**, Sp. Pl.: 636. 1753; Nees in Wallich, Pl. Asiat. Rar. 3: 94. 1832; Graham, Cat. Pl. Bombay: 160. 1839; Voigt, Hort. Suburb. Calcutt.: 486. 1845; Wight, Icon. Pl. Ind. Orient. 3: 6, t. 870. 1845; Anderson, J. Linn. Soc., Bot. 9: 489. 1867; Clarke in Hooker, Fl. Brit. India 4: 483. 1884; Cooke, Fl. Bombay 2: 458. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Gamble, Fl. Madras 2: 742. 1924; Santapau,

Bot. Mem. Univ. Bombay 2: 58. 1952; Matthew, Fl. Tamilnadu Carnatic: 1160, t. 90b. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 442. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 697. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 598. 2001; Daniel & Umamaheshwari, Fl. Gulf Mannar: 322. 2001; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 13. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 5. 2009.

Fig. 1, 20c

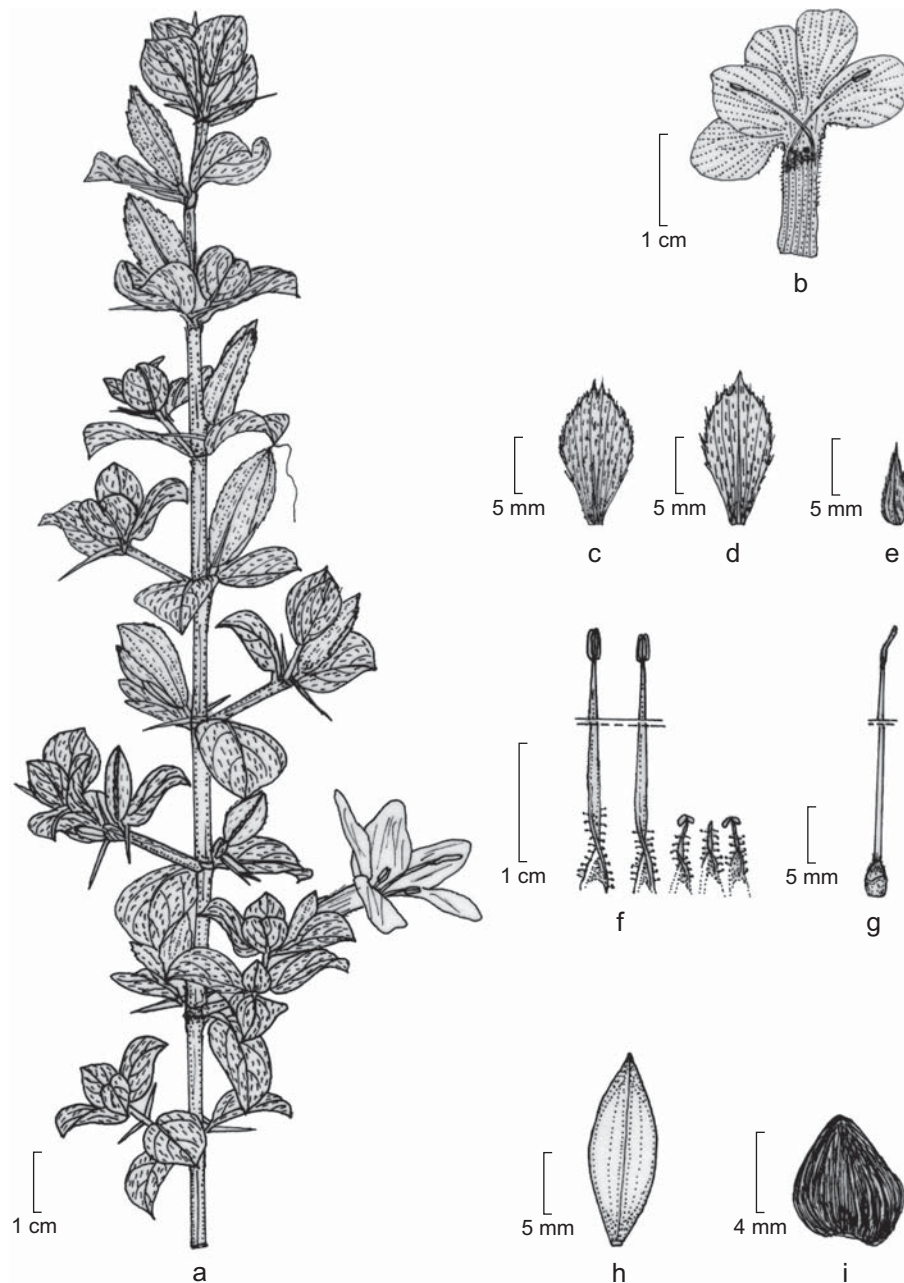


Fig. 1. *Barleria buxifolia* L.: a. Flowering twig; b. Corolla split open; c, d. Outer sepals; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

Type: India, Herb. *Linnaeus* 805.8 (Photo!, LINN).

Vernacular Name: *Rose mullippoindu* (Tamil).

English Name: Hopehead.

Herbs, perennial, erect, up to 1 m high, pubescent, armed. Stems terete, hairy; thorns 4 per node, c. 1 cm long. Leaves broadly elliptic, obovate to orbicular-obovate, 1 – 3 × 0.8 – 2.5 cm, obtuse at base, ciliate at margins, mucronate at apex; lateral veins 3 or 4 pairs; petioles 0.2 – 1.5 cm long. Flowers solitary, axillary, sessile; bracts spinescent, c. 1 cm long, green when young, ash-white or brown when mature. Outer sepals elliptic or ovate, subequal, 1 – 1.5 × 0.5 – 0.8 cm, ciliate and spinescent at margins, mucronate-spinescent at apex, appressed-pubescent; inner sepals linear or lanceolate, 4 – 6 × c. 1 mm, ciliate at margins, acute-spinescent at apex. Corolla c. 3 cm long, glandular outside, light blue; tube c. 2 cm long, bent at base; lobes subequal, 0.8 – 1.2 × 0.5 – 0.8 cm; lower lobes 2, ovate; upper lobes 3, suborbicular or obovate. Fertile stamens 2, exserted; filaments c. 1.5 cm long, glandular-hairy at base; anthers c. 4 mm long, purple; sterile stamens 2, 3 – 5 mm long, sometimes rudimentary; staminode scaly, 3 – 4 mm long. Disc cupular, covering ½ of the ovary. Ovary hairy at apex; ovules 2 in each locule; style 2 – 3 cm long, glabrous, purple at base; stigma filiform, c. 3 mm long. Capsules ellipsoid, 1.5 – 2 × 0.4 – 0.5 cm, compressed, glabrous, 4-seeded. Seeds ovate, cordate at base, 4.5 – 5.5 × 4.5 – 6 mm, appressed-hairy, metallic brown.

*Flowering & Fruiting*: July – February.

*Habitat*: Open lands especially in drier parts.

*Distribution*: World: India and Sri Lanka. India: Andhra Pradesh, Karnataka, Kerala, Punjab and Tamil Nadu.

*Specimens examined*: INDIA, Western India, without precise locality, *s. die*, Gibson *s.n.* (CAL). **Karnataka**, Dharwar district, Kuput hills, 20.9.1889, Talbot 1984 (BSI, CAL); Dharwar, 1.11.1889, Talbot 2032 (BSI). **Kerala**, Malabar, Taliparambo, 20.9.1904, Barber 6476 (MH); Ernakulam district, Chalakudi-Cochin, November 1910, Meebold *s.n.* (CAL); Kasaragod district, 30.12.1980, Ansari 70062 (CAL, MH); Malappuram district, Anayam, 4.12.1985, Babu 38277 (CAL); Palakkad district, Shoranur, 8.3.1957, Janaki Ammal 2045 (MH); Thrissur district, between Guruvayur and Chavakkad, 6.10.1976, Ramamurthy 47660 (CAL, MH). **Tamil Nadu**, Coimbatore & Madurai, *s. die*, Brandis *s.n.* (CAL); Coimbatore district, Navam-

alai, 26.6.1962, Joseph 14180 (CAL, MH); Aliyar submergible area, 28.7.1962, Sebastine 14676; Selvapuram, 11.10.1964, Chandrabose 28598; Way to Sundakkamuthur, 14.6.1968, Deb 30237 (MH); On way to Aliyar check post, 10.3.1978, Ansari 1143 (CAL).

*Notes*: Moorthy (2001) included this species for Maharashtra on the basis of Cooke (1904). The present study unable to confirm its occurrence in Maharashtra. Hence, its presence in Maharashtra is uncertain.

**Barleria cristata** L., Sp. Pl.: 636. 1753; Willdenow, Sp. Pl. ed. 4, 3: 378. 1800; Curtis, Bot. Mag. 39: t. 1615. 1814; Loddiges, Bot. Cab. 4: t. 34. 1817; Roth, Nov. Pl. Sp.: 315. 1821; Roxburgh, Fl. Ind. 3: 37. 1832; Nees in Wallich, Pl. Asiat. Rar. 3: 92. 1832 & in de Candolle, Prodr.: 11. 229. 1847; Graham, Cat. Pl. Bombay: 160. 1839; Wight, Icon. Pl. Ind. Orient. 2: 3, t. 453. 1841; Voigt, Hort. Suburb. Calcutt.: 485. 1845; Anderson in Thwaites, Enum. Pl. Zeyl.: 230. 1860 & J. Linn. Soc., Bot. 9: 490. 1867; Dalzell & Gibson, Bombay Fl.: 188. 1861; Clarke in Hooker, Fl. Brit. India 4: 488. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 336. 1911; Prain, Bengal Pl. 2: 606. 1903; Cooke, Fl. Bombay 2: 460. 1904; Duthie, Fl. Gangetic Plain: 70. 1911; Parker, Forest Fl. Punjab: 883. 1918; Gamble, Fl. Madras 2: 743. 1924; Kanjilal *et al.*, Fl. Assam 3: 445. 1939; Santapau, Bot. Mem. Univ. Bombay 2: 59. 1952; Maheshwari, Fl. Delhi: 274. 1963 & Ill. Fl. Delhi: f. 171. 1966; Malhotra & Moorthy, Bull. Bot. Surv. India 13: 309. 1974; Stewart, Punjab Pl.: 165. 1977; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Malhotra & Rao, Bull. Bot. Surv. India 22: 8. 1982; Balakrishnan, Fl. Jowai: 362. 1983; Matthew, Fl. Tamilnadu Carnatic: 1162, t. 90c. 1983; Chowdhery *et al.*, Fl. Himachal Pradesh 2: 548. 1984; Sharma *et al.*, Fl. Karnataka: 202. 1984; Shetty & Singh, Fl. Rajasthan 2: 632. 1991; Saxena & Brahmam, Fl. Orissa 3: 1331. 1995; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 697. 1997; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 290. 1997; Daniel & Umamaheshwari, Fl. Gulf Mannar: 422. 2001; Kumar, Fl. Haryana: 285. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 599. 2001; Singhetal., Fl. Mizoram: 41. 2002; Almeida, Fl. Maharashtra 4(A): 10, f. 6, t. 1, p. 6. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 13. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 5. 2009. **Fig. 2, 20e,f,g**

Type: India, Herb. *Linnaeus* 805.12 (Photo!, LINN).

*Barleria ciliata* Roxb., Hort. Bengal.: 45. 1814 & Fl. Ind. 3: 38. 1832; Nees in Wallich, Pl. Asiat. Rar. 3:

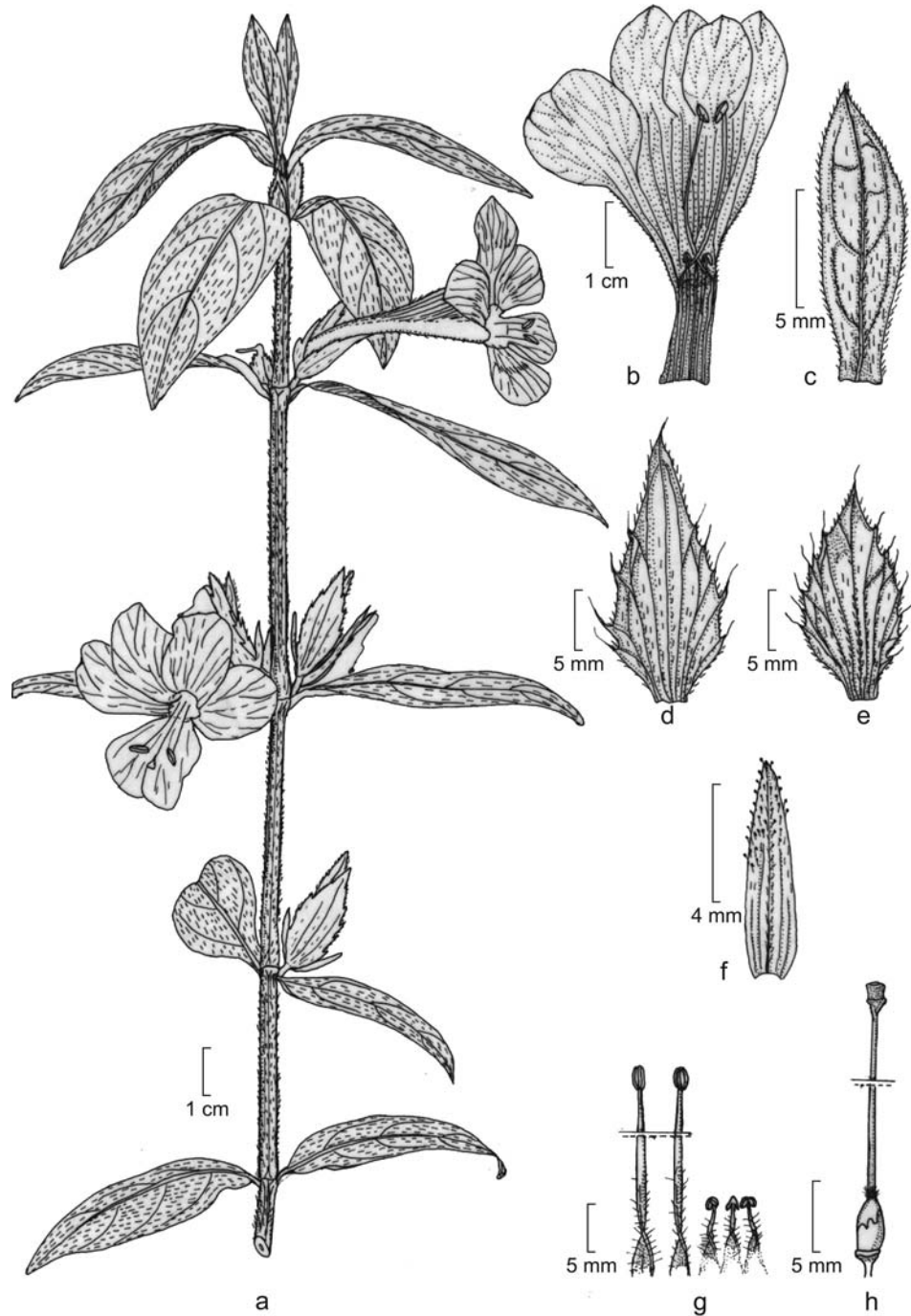


Fig. 2. *Barleria cristata* L.: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil.

92. 1832 & in de Candolle, Prodr. 11: 228. 1847, **syn. nov.**

Type: India, Wall., Numer. List No. 2507a (CAL!).

*Barleria alba* Lodd., Bot. Cab. 4. t. 360. 1819, **syn. nov.**

*Barleria dichotoma* Roxb., Fl. Ind. 3: 93. 1832; Nees in Wallich, Pl. Asiat. Rar. 3: 91. 1832 & in de Candolle, Prodr. 11: 227. 1847; Dalzell & Gibson,

Bombay Fl.: 188. 1861; Voigt, Hort. Suburb. Calcutt.: 485. 1845.

Type: Wall., Numer. List No. 2508a, b, c. (CAL!).

*Barleria laciniata* Nees in Wallich, Pl. Asiat. Rar. 3: 91. 1832.

Type: Wall., Numer. List No. 7144 (CAL!).

*Barleria napalensis* Nees in Wallich, Pl. Asiat. Rar. 3: 91. 1832 & in de Candolle, Prodr. 11: 228 – 229. 1847.



Type: Wall., Numer. List No. 2508e (CAL!).

*Barleria nuda* Nees in Wallich, Pl. Asiat. Rar. 3: 92. 1832 & in de Candolle, Prodr. 11: 228 – 229. 1847.

Type: Wall., Numer. List No. 2508d (CAL!).

*Barleria indica* L. ex T. Anderson, J. Proc. Linn. Soc., Bot. 7: 115. 1864.

Type: India, Herb. *Linnaeus* 805.12 (Photo!, LINN).

*Barleria cristata* L. var. *dichotoma* (Roxb.) Prain, Bengal Pl.: 812. 1903; Cooke, Fl. Bombay 2: 460. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Santapau, Bot. Mem. Univ. Bombay 2: 59. 1952; Maheshwari, Fl. Delhi: 274. 1963; Bhandari, Fl. Ind. Desert: 266. 1978; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Sharma *et al.*, Fl. Karnataka: 202. 1984; Rao, Fl. Goa: 319. 1986; Shetty & Singh, Fl. Rajasthan 2: 632. 1991; Naithani *et al.*, Forest Fl. Goa: 473. 1997; Kumar, Fl. Haryana: 285. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 599. 2001; Almeida, Fl. Maharashtra 4(A): 11, t. 1. p. 7. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

*Barleria cristata* L. var. *albida* Haines, Bot. Bihar Orissa 4: 683. 1922; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009, **syn. nov.**

Type: Neterhat, E. India.

Vernacular Names: *Jati*, *Jhinti*, *Swetjhanti* (Bengali); *Morani* (Bihari); *Bansa* (Hariyani); *Kala Bansa*, *Patro*, *Safad Cheeta*, *Tadrelu* (Hindi); *Jhante*, *Jhinti*, *Kinkiraatha*, *Kuruwaka*, *Mullu Gorate*, *Patikada Hoo*, *Sphatika*, *Sphatikada Hoovu* (Kannada); *Karimkurrunni* (Malayalam); *Gokran*, *Koranti*, *Kuruwaka*, *Nili Koranti* (Marathi); *Banfetali*, *Banpatoli*, *Daskarada*, *Saireyaka* (Odia); *Bansa Siyah*, *Tadrelu* (Punjabi); *Artagala*, *Bana*, *Dasi*, *Dasikurantaka*, *Jhinti*, *Kakubha*, *Mahasaha*, *Nilamlaainduka*, *Ragaprasava*, *Saereyakanilapusp* (Sanskrit); *December Poo* (Tamil); *December Puuvulu*, *Peddagorinta* (Telugu).

English Names: Philippine Violet-white, Blue bell *Barleria*.

Shrubs, perennial, erect, up to 2 m high. Stems appressed-hairy, densely so at nodes. Leaves elliptic-lanceolate, 6 – 15.5 × 2 – 5 cm, attenuate at base, ciliate at margins, acute-acuminate at apex, lineolate above, hairy; midrib hirsute above; lateral veins 5 – 7 pairs; petioles 0.5 – 2 cm long. Flowers in dense ovoid spikes, axillary and terminal, 4 – 5.5 cm long; bracts and bracteoles linear, 1 – 1.5 × 0.1 – 0.2 cm, ciliate and often distantly toothed at margins, acute at apex, membranous, pubescent, veined. Outer sepals subequal, 1.7 – 2 × 0.6 – 0.8 cm, brownish white when dry, with

veins raised; anticous broadly lanceolate, spinescent at margins, acute-mucronate at apex; posticous similar but slightly narrow, 1.6 – 1.8 × 0.6 – 0.7 cm, spinescent at margins, pubescent; inner sepals linear-lanceolate, 7 – 8 × c. 2 mm, acute at apex, ciliate at margins, glandular-pubescent outside, whitish, veined. Corolla pubescent outside with intermixed glandular hairs, pink, blue or white; lower tube narrow; upper tube wide; lobes obovate-oblong, 1 – 1.8 × 0.8 – 1.8 cm, obtuse at apex; lower lobe emarginate at apex. Fertile stamens 2, exerted; filaments 2 – 3 cm long, pubescent; anthers c. 2 mm long; sterile stamens 2, 4 – 6 mm long; staminode 1, opposite median lobe, scaly. Disc cupular, covering more than ½ of ovary, unevenly lobed at apex. Ovary c. 3 mm long; ovules 2 in each locule; style terete, 2.5 – 4.5 cm long, swollen at apex, hairy at base; stigma c. 5 mm long, 2-lobed, pink. Capsules ellipsoid, 1.2 – 1.8 × 0.4 – 0.6 cm, 4-seeded. Seeds ovate or suborbicular, 4 – 5 × 4 – 4.5 mm, compressed, silky appressed-hairy.

*Flowering & Fruiting*: June – March.

*Habitat*: Cultivated, also found as an escape.

*Distribution*: World: Bangladesh, China, India, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka and Vietnam. India: Throughout.

*Specimens examined*: INDIA, **Andhra Pradesh**, Anantapur district, Aralev valley-Vigale, *s. die*, Nazeeruddin 27638; Shararoy hills, 5.11.2003, Nazeeruddin 24869 (CAL); Godavari district, Annavaram R.F., 18.1.1916, *s. coll.*, *s.n.* (MH); Rampa Chodavaram, 3.10.1920, *Narayanaswami* 423 (CAL); Kota, 8.10.1920, *Narayanaswami* 511; Kurnool district, way to Diguvametta-Nallamalai, 24.10.1964, *Ellis* 22177 (MH); Vishakapatanam district, Araku valley, 15.9.1961, *Balakrishnan* 579 (CAL); Back to inspection bungalow, 11.9.1964, *Subba Rao* 21559 (MH). **Assam**, without precise locality, *s. die*, *Wallich s.n.*; Assam, *s. die*, *Bal* 433; Garampani, *s. die*, *Panigrahi* 4217; Petepoo district to Ziro, 28.9.1959, *Panigrahi* 19680 (CAL). **Bihar**, Champaran district, Manguraha forest, 10.4.1963, *Thothathri* 610; On the way to Someshwer from Gobardhana, 16.11.1963, *Shetty* 607; Hazaribagh district, Camary hill, 5.9.1993, *Das* 22422; Mazarikagh district, Kayli forest, 11.11.1984, *Kanodia* 1130; Palaman district, Latua R.F., 31.12.1960, *Rao* 22983; Jalan Fikterangh station, Netanhat, 24.9.1981, *Mama & Samacedor* 918 (CAL). **Chhattisgarh**, Bastar district, Kesal, 16.11.1958, *Subramanyam* 7099 (MH). **Goa**, Vernem, 13.9.1965, *Chavan* 106137 (CAL). **Himachal Pradesh**, Shimla district, Shimla ghat, October 1885, *Grant* 69581 (MH); Road



to Shimla, September 1890, *Cooke s.n.* (BSI); Una district, 7 km to Bharwain, pine forest, 11.10.1977, *Vander Maosen* 2867; Taradevi, 15.10.1977, *Coamamlli* 396 (CAL). **Jharkhand**, Ranchi district, Nakta hills, 35 km West to Ranchi, 20.11.1964, *Kanodia* 1359; Deshmagh falls, 24.10.1966, *Banerjee* 1743 (CAL). **Karnataka**, Bangalore district, Nandi hills, 25.7.2006, *Shendage* SMS2530 (SUK); Bellary district, Ramdurg, 18.2.1917, *s. coll., s.n.*; Dharwar district, Kappat hills, 30.11.1908, *Kulkarni* (BSI); Karwar district, Yellapure, 25.10.1883, *Talbot* 69584; Mysore district, Nandi doorg, 17.9.1911, *Anstead* M122 (MH); Nishanigudda, Agumbe, 4.9.1960, *Raghavan* 68150; Gopalswami hill near Bandipur, 4.2.1979, *Prakash & Sreenath* 5746; Shimoga district, Hulikal Ghat, 23.3.1964, *Raghavan* 97122 (CAL); South Canara district, Betangudi, 25.11.1900, *Barber* 2542 (MH). **Kerala**, without precise locality, 12.2.1913, *Hooper & Ramaswami* 38464 (CAL); Kasargod district, Kasargod, 12.12.1931, *Narayana* 61697 (MH); Kottayam district, Kareyalarmeth reservoir, Ariankara, 12.5.1961, *Subramanyam* 71027 (BSI); Mondakayam, 27.8.1984, *Antony* 662 (MH); Malappuram district, Karulayi, 21.9.1984, *Sivarajan* 37972 (CAL); Palakkad district, Walayar house, 28.10.1963, *Joseph* 17909 (MH); Wayanad district, Muthunga, on the way to Nellurvalayal, 23.11.1986, *Balakrishnan* 42601 (CAL). **Madhya Pradesh**, Hoshangabad district, Near Pachmari, 8.10.1960, *Joseph* 11339 (MH); Pachmari, 11.10.1969, *Naik* 582 (BAMU); Indore district, Patalpani falls, 20.12.1962, *Rao* 83958 (BSI). **Maharashtra**, Beed district, Beed, 7.1.1983, *Rothe* 5570 (BAMU); Bombay district, Victoria garden, Bombay, 28.1.1903, *Supeth* (BSI); Gondia district, Nagzira, 21.10.2005, *Shendage* SMS2503; Kolhapur district, Suleran, *s. die*, *Sardesai* 1120; Kolhapur, 6.11.2005, *Shendage* SMS2506 (SUK); Nagpur district, College of Science premises, 10.10.1962, *Nafday* 61 (CAL); Nandad district, Northern forest, 6.6.1976, *Zate s.n.*; Baoth road, 28.11.1978, *Zate* 558; Mahur, 6.11.1979, *Zate* 1020; Osmanabad district, Osmanabad town, 17.9.1965, *Naik* 1132; Parbhani district, Aundha, 3.9.1972, *Vaidya* 319; Yeldari, 23.9.1984, *Madhukar* 6769 (BAMU); Pune district, College garden, Poona, 1.12.1902, *Garade* (BSI); Ratnagiri district, Phonda, 10.12.2005, *Shendage* SMS2517, SMS2518 (SUK). **Manipur**, Seeka river, Nungha, January 1882, *Watt* 666 (MH); Kala Naga hills, May 1882, *Watt* 7357; Seeka river, Nungha, 14.7.1882, *Watt* 6663 (CAL). **Meghalaya**, Meghalaya, *s. die*, *Masters* 834 (CAL). **Nagaland**, Nagaland district, Naga hills Jotsama, 1886, *Prain s.n.*; Charaya, 1886, *Prain s.n.* (CAL). **Odisha**, Gajapati district, Mahendragiri, Ganjam, 9.4.1904, *Fischer & Gage* 340097; Sam-

balpur district, Sendriagag, 4.11.1986, *Das & Panda* 243; Sundarbagh district, Bhatipather, 1.11.1959, *Panigrahi* 20695; Amarekhol, 3.11.1959, *Panigrahi* 20766; Manblang, 12.11.1959, *Panigrahi* 21027; Tesna, 14.10.1987, *Mukherjee & Namhata* 2570 (CAL). **Punjab**, without precise locality, *s. die*, *Hoof & Thomson s.n.* (CAL). **Rajasthan**, Sirohi district, Mt. Abu, 19.11.2005, *Shendage* SMS2515 (SUK); Pali district, Gagan garden, 23.8.1957, *Bhagwat* 23530; Khambghat-Kalighal, near Birmguda, 8.10.1962, *Kanodia s.n.* (BSI); Way to Kumbhalgarh R.F., 26.12.1985, *Pandey* 19422 (CAL). **Sikkim**, *s. die*, *Hooker s.n.* (MH); Simeabong to Beachg, 30.9.1862, *Anderson s.n.*; Pankahari, 18.2.1911, *Ribu & Rhomoo s.n.*; Coal field region, Peuj, West Bokaro, 24.12.1993, *Chada* 20916 (CAL). **Tamil Nadu**, Coimbatore district, R.S. Puram, 4.10.1964, *Chandrabose* 28561; R.S. Puram, 7.9.1971, *Chandrabose* 39240 (MH); Nilgiri district, Kallar gardens, 3.9.1957, *Sebastine* 4227 (CAL, MH). **Uttarakhand**, Dehra Dun district, Mussoori, 12.1843, *Mackinnon s.n.*; Nalapani, March 1884, *Gamble* 24598 (CAL); New forest, Dehra Dun, 13.10.1949, *Mani* 93740 (MH); Pithoragarh district, Kalapani, September 1891, *Gamble s.n.* (BSI). **Uttar Pradesh**, Gorakhpur district, Ramgarh, 1.11.1910, *Prasad* 34818; Chatham line, 10.9.1963, *Singh* 978; West Lehri, Pharenda, 1.11.1963, *Cap Gron* 1453; Mirzapur district, Prpri, 13.10.1969, *Panigrahi* 12497 (CAL). **West Bengal**, Birbhum district, Ashram garden, 22.2.1986, *Biswas* 19593; Jalpaiguri district, Titi-2, 3.3.1976, *Sikdar* 4496; Midnapur district, Narayan garh, 18.11.1976, *s. coll.* 7573; Nadia district, Kalyani, December 1992, *Ghora s.n.*; Purulia district, Tarpani, Ajadhya hills, 17.5.1963, *Chatterjee* 89; Matha, 11.9.1964, *Malick* 37; Gopalbandh, 7.3.1973, *Maji* 2993 (CAL).

*Notes:* Commonly cultivated in the gardens as ornamental plant and also found an escape up to 2000 m. The flowers open between 7 and 9.30 am and remain till the next day.

***Barleria longiflora*** L.f., Suppl. Pl.: 239. 1782; Roxburgh, Fl. Ind. 3: 40. 1832; Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832 & in de Candolle, Prodr. 11: 235. 1847; Graham, Cat. Pl. Bombay: 161. 1839; Anderson, J. Linn. Soc., Bot. 9: 491. 1867; Clarke in Hooker, Fl. Brit. India 4: 485. 1884; Prain, Bengal Pl. 2: 605. 1903; Talbot, For. Fl. Bombay 2: 336. 1911; Haines, Bot. Bihar Orissa 4: 684. 1922; Gamble, Fl. Madras 2: 742. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 64. 1952; Matthew, Fl. Tamilnadu Carnatic: 1164, t. 88e, 90f. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 446. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Saxena & Brahmam, Fl. Orissa 3: 1332. 1995; Daniel

& Umamaheswari, Fl. Gulf Mannar: 423. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 601. 2001; Almeida, Fl. Maharashtra 4(A): 14. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

**Fig. 3, 21e**

Type: *Linnaeus* 805.14 (Photo!, LINN).

Vernacular Names: *Koilakha* (Odia); *Adyanda* (Sanskrit); *Pinnagorinta* (Telugu).

Shrubs, perennial, erect, up to 2 m high. Stems terete, tomentose. Leaves elliptic-ovate, 3 – 8 × 2 – 5 cm, rounded at base, entire at margin, acute at apex, stellate and glandular-hairy; lateral veins 4 or 5 pairs; petioles 1 – 2.5 cm long, pubescent. Flowers solitary, axillary or in terminal 1 – few-flowered scorpioid cymes; bracts linear-lanceolate, 1 – 2 × 0.2 – 0.3 cm, acute at apex, stellate- and glandular-hairy. Outer sepals ovate, subequal, 1.5 – 2.5 × 1 – 1.5 cm, cordate at base, entire at

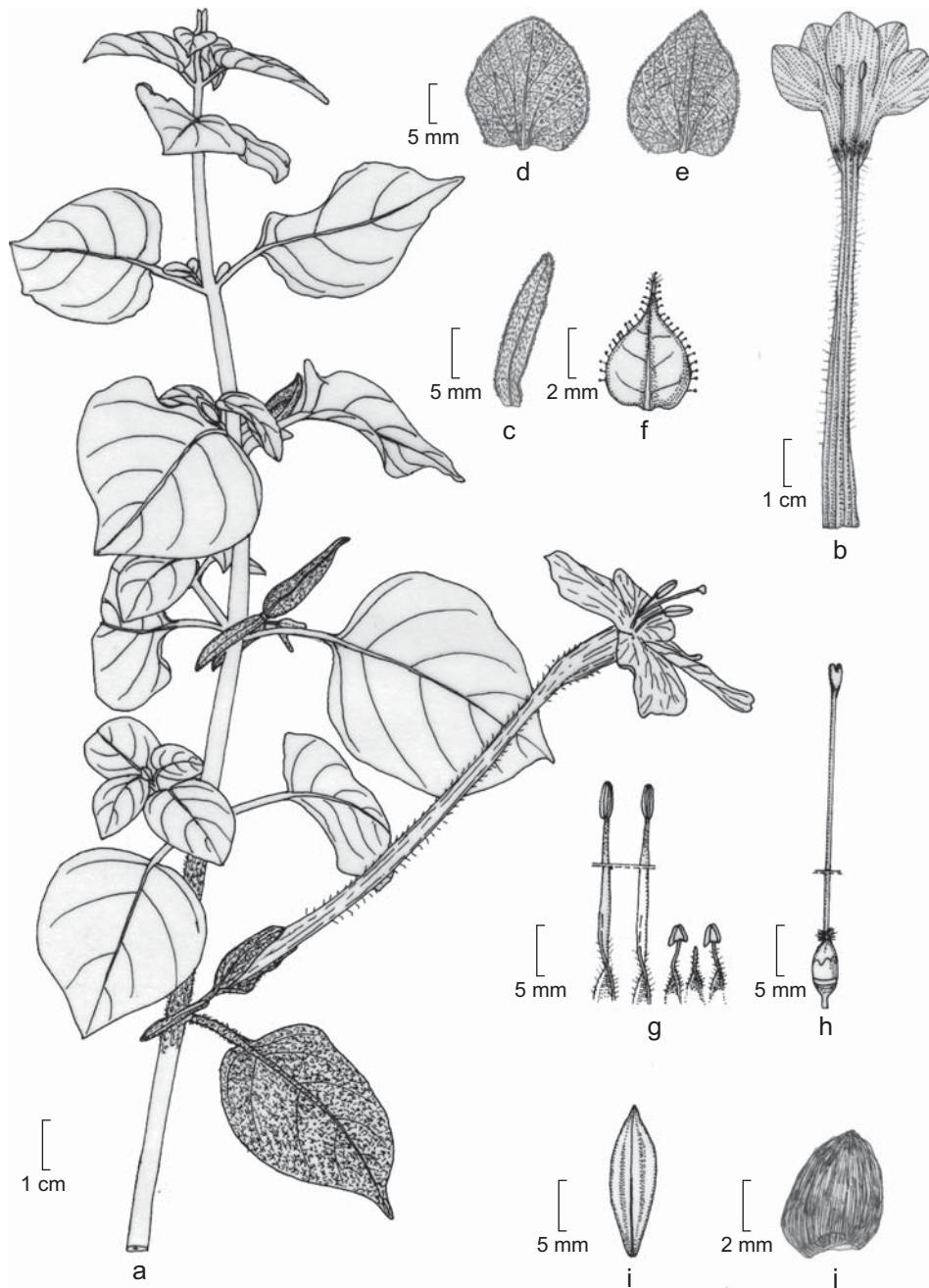


Fig. 3. *Barleria longiflora* L.f.: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

margin, obtuse at apex, stellate- and glandular-pubescent outside, prominently palmately veined, reticulate; inner sepals ovate, 5 – 6 × 3 – 4 mm, cordate at base, ciliate-glandular at margin, long-mucronate at apex, scarious, variegated with green veins. Corolla 7 – 12 cm long, hairy outside, white, blue-tinged; lobes oblong to oblanceolate, 1.5 – 2.3 × 0.8 – 1.2 cm, emarginate at apex, prominently veined; tube 6 – 10 cm long. Fertile stamens 2, exserted; filaments 1.2 – 1.6 cm long, hairy at base, brown at base and apex; anthers *c.* 4 mm long; sterile stamens 2; filaments *c.* 2 mm long; staminode *c.* 1 mm long. Disc cupular, covering about ½ of ovary. Ovary oblongoid, *c.* 5 × 2 mm, glabrous, 2-loculed; ovules 2 in each locule; style 8 – 10 cm long, hairy at base; stigma less than 1 mm long, 2-lobed. Capsules ellipsoid, 1.4 – 2 × 0.4 – 0.6 cm, compressed, narrowed at base, pointed at apex, glabrous, 4-seeded. Seeds ovate to suborbicular, 4.5 – 6 × 4 – 5.5 mm, subcordate at base, compressed, clothed with silky hairs.

*Flowering & Fruiting:* August – February.

*Habitat:* Rocky crevices in drier regions and along dry hill slopes.

*Distribution:* India: Andhra Pradesh, Karnataka, Maharashtra, Odisha and Tamil Nadu. Endemic.

*Specimens examined:* INDIA, **Andhra Pradesh**, Anantapur district, Alur kona, 28.10.1982, Pullaiah 931; Guntur district, Kandanedu forest, 15.10.1902, Barber 4607; Krishna district, Kondahalli, January 1887, Gamble 18576; Kondahalli, 4.8.1985, Vantanna 5618; Kurnool district, Way to Srisailam, Nallamalai, 21.10.1964, Ellis 22153; Nalgonda district, Nagarjunasagar, 13.12.1959, Sebastine 9751 (MH). **Karnataka**, Mysore district, Khambatki ghat, 2.11.1964, Raghavan 104086; Raichur district, Bankaldoddi R.F., Deodurg, 14.11.1975, Singh 141692 (BSI). **Maharashtra**, Aurangabad district, Nagapur, 21.9.1973, Pokle 299; Beed district, Sautada, 21.11.1982, Rothe 5326; Mukundraj, 22.11.1982, Rothe 5444 (BAMU); Pune district, Katraj ghat, 5.10.1905, Talbot 4441a; Kamalgi ghat, 2.11.1905, Talbot 4441b, c (BSI); Satara district, Agashiva hills, 16.10.2005, Shendage SMS2502; Khambatki ghat, 17.11.2005, Shendage SMS2514 (SUK). **Odisha**, Ganjam district, Russelkonda, December 1906, Gamble 38430 (MH). **Tamil Nadu**, Travancore, Wall., Numer. List No. 2501a (CAL); Chengalpettu district, Thirukazhukundrum, 18.12.1916, *s. coll.* 14067; Vandalur, 10.1.1958, Subramanyam 5413; Vandalur, 3.2.1976, Henry 47153; Thirukazhukundrum, Vedhagire-

swarer hill, 5.11.1983, Narasimhan 121; Coimbatore district, Lake bed, Getur, 19.8.1929, Narayanswami 190603; Dharmapuri district, Dharmapuri, 20.12.1978, Matthew 20592; Madurai district, Alagar hills, 17.2.1958, Subramanyam 5350 (MH); Karandamalai hills & Alagar hills, 30.1.2007, Shendage SMS2539 (SUK); North Arcot district, Sathanur dam forest, 26.11.1971, Vajravelu 52091; Pudukottai district, Narthamalai, 23.2.1985, Arulappan 363; Ramanathapuram district, Piranmalai – Tirupathur, 19.12.1964, Ramamurthy 22781; Salem district, Hogainakkal forest, 24.11.1964, Vajravelu 21902; South Arcot district, Ginjee R.F., 17.3.1961, Sebastine 12171; Gomukhi dam, Thagari forest north, 19.1.1978, Ramamurthy 52852 (MH); Gomukhi dam, Thagari forest north, 14.12.1978, Matthew & Perumal 20215 (CAL).

*Notes:* This plant closely resembles *B. acuminata* in its stellate-hairy leaves, but differs by long, narrow corolla tube. Plants growing in Maharashtra show white flowers with blue tinge, long linear limbs while plants growing in Tamil Nadu show pure white flowers with short and oblong limbs. Flowers open around 3 pm and remains till the next day.

**Barleria mysorensis** Roth, Nov. Pl. Sp.: 313. 1821; Clarke in Hooker, Fl. Brit. India 4: 484. 1884; Gamble, Fl. Madras 2: 742. 1924; Sharma *et al.*, Fl. Karnataka: 203. 1984; Nicolson *et al.*, Regnum Veg. 119: 36. 1988; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 4, 21h**

Type: India, Herb. Rottler A' A' (Photo!, K).

*Barleria spina-ceylanica* Nees in de Candolle, Prodr. 11: 242. 1847; Anderson, J. Linn. Soc., Bot. 9: 490. 1867.

Type: Sri Lanka.

*Barleria bispinosa* Nees in Wallich, Pl. Asiat. Rar. 3: 94. 1832 & in de Candolle, Prodr. 11: 241. 1847.

Type: India, Wight, Herb. Propr. No. 1966.

Vernacular Name: *Chulli* (Malayalam).

Undershrubs, perennial, much branched, glandular-pubescent, densely armed. Stems terete; thorns simple, 4 per node, *c.* 1 cm long, ash-white. Leaves sessile, elliptic-ovate to orbicular, 0.8 – 2 × 0.5 – 1.5 cm, cuneate at base, ciliate at margins, acute-mucronate at apex; lateral veins 3 or 4 pairs. Flower solitary, axillary; bracts spinescent, *c.* 1.5 cm long. Outer sepals ovate-oblong, subequal, 1 – 1.8 × 0.3 – 0.4 cm, ciliate at margins, mucronate at apex, glandular-hirsute; inner sepals linear-lanceolate,



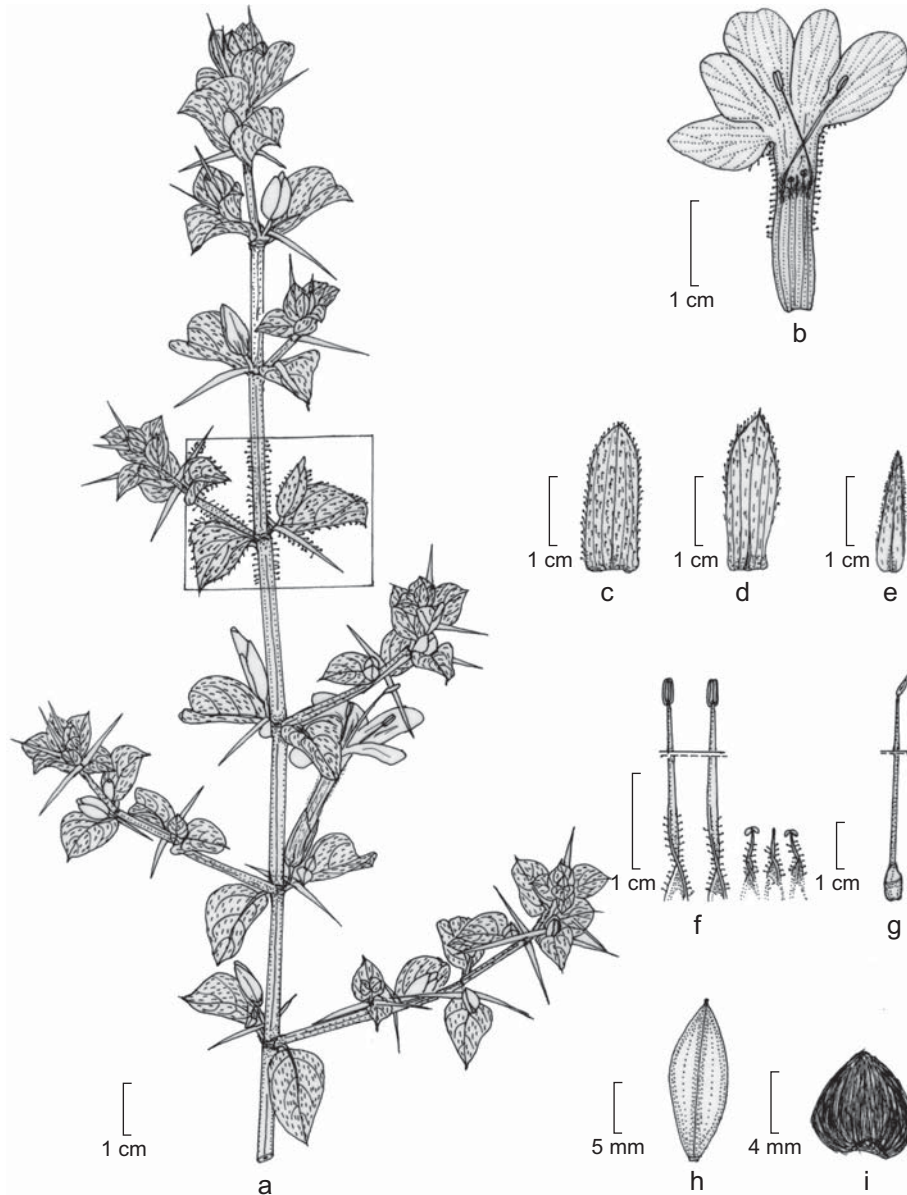


Fig. 4. *Barleria mysorensis* Roth: a. Flowering twig; b. Corolla split open; c, d. Outer sepals; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

5–8 × 1–2 mm, ciliate at margins, acute at apex, sparsely glandular-hirsute on upper half. Corolla c. 3 cm long, glandular-hairy outside, pink or white; lobes obovate, subequal, 1–1.5 × c. 0.5 cm, obtuse at apex; tube c. 2 cm long, glandular-pubescent towards upper half. Fertile stamens 2, exserted; filaments c. 1.5 cm long; anthers c. 4 mm long; sterile stamens 2, c. 4 mm long; staminode scaly. Disc cupular, covering ½ of ovary. Ovary oblongoid, c. 2.5 mm long; ovules 2 in each locule; style c. 2.5 cm long. Capsules ellipsoid, 1.5–2 × 0.8–1 cm, compressed. Seeds broadly ovoid, c. 4 mm across, subcordate at base, clothed with appressed-silky hairs.

*Flowering & Fruiting:* July – March.

*Habitat:* Deciduous forests and in exposed rocky localities.

*Distribution:* World: India and Sri Lanka. India: Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

*Specimens examined:* INDIA, Western India, *s. die*, Gibson *s.n.* (CAL). **Andhra Pradesh**, Chittoor district, on the way to Rishy valley roadside, 17.9.1986, *Rangacharya* 599; Cuddapah district, Sidhul hills, February 1883, *Gamble* 10868 (CAL); Balapalle, 21.7.1962, *Ellis* 14328 (CAL, MH); Nellore district, Atamkur, 21.9.1937, *Jacob* 83326

(MH); Prakasam district, Nandanavanam hill, Velesandia R.F., 18.7.1984, *Mohan* 435 (CAL). **Karnataka**, Bengaluru district, Bangalore, 27.2.1957, *Janaki Ammal* 7330 (MH); On the way to Ramanagaram, 23.2.1978, *Ramesh* 205 (CAL); Chikmagalur district, Kadur, 6.9.1893, *Talbot* 2962; Bababuden hills, 20.12.1893, *Talbot* 3252 (BSI); Kadur, 12.8.1959, *Ahuja* 59310; Chitradurg district, Turuvanur, s. die, *Ramesh & Manohar* 5596 (CAL); Mari Kanve S.F., Hiriyar, 16.9.1974, *Singh* 133056; Holalkre – Hosderd Rd., 15 mile, 1.1.1976, *Singh* 141947; Coorg district, Veerohasli, 11.3.1958, *Puri* 33159; Fraserpeth, 23.11.1959, *Puri* 46073 (BSI); Hassan district, Four miles before Holenarsipur from Channarayapatna, 11.11.1971, *Hooper & Gandhi* 2430; Mysore district, Mysore, October 1910, *Meebold* 11402 (CAL); Mysore, 6.3.1958, *Puri* 32327; Ramana hill, 1.10.1958, *Mahajan* 19893; Nayandahalli forest, 23.4.1959, *Puri* 53337; Hansur, 17.3.1960, *Asara* 61596 (BSI); Chamundi hills, 12.3.1964, *Sebastine* 18742; Bandipoor, 24.1.1965, *Naithani* 23126 (MH); Tumkur district, Chunganagara, 14.10.1958, *Wadhwa* 42643; Madhugiri R.F., 8.1.1976, *Singh* 14200 (BSI). **Kerala**, Alappuzha district, Vadaikal, 20.2.1957, *Puri* 15710 (BSI); Palakkad district, way to Sholayar, 19.4.1978, *Bhargavan* 56914 (CAL); Ernakulam district, Chalakudi, 20.2.1957, *Puri* 15713 (BSI). **Tamil Nadu**, Coimbatore district, Ichipali R. F., 17.8.1929, *Narayanswami* 18733; Girivalam, 17.3.1931, *Jacob* 417 (MH); Varapalayam, towards the base of Lamptons peak, 27.4.1956, *Subramanyam* 4 (CAL); Perur-Noyal river bank, 6.6.1956, *Subramanyam* 59; Maruthamalai, 7.8.1956, *Sebastine* 502 (MH); Navamalai R.F., 22.5.1962, *Ramamurthy* 14055; Dharmapuri district, Near Venkitampattu-Kud-dor, 16.7.1978, *Vajravelu* 57824 (CAL, MH); Kanniyakumari district, Alagiyapandipuram, 30.7.1977, *Henry* 49451 (CAL); Madurai district, Eastern slope of Murugamalai, 16.6.1961, *Sebastine* 12612 (CAL, MH); Butlagundy, 14.1.1988, *Sudhersan* 464 (CAL); Vannathiparai, 18.9.1995, *Jacob* 17735 (MH); North Arcot district, Inner Javadi R.F., 12.7.1958, *Subramanyam* 6021 (CAL, MH); Mantharakuttai-Kavalur, 18.3.1978, *Vajravelu* 53476 (CAL); Salem district, Morappur, 16.2.1915, s. coll. 11668; Pennagaram R.F., 24.7.1964, *Vajravelu* 20739 (MH); Pappanaikapatti, 19.7.1977, *Ansari* 49907 (CAL, MH); Tharamangalam, 8.12.1978, *Matthew* 19800; Shevaroy hills, 22.8.1978, *Perumal & Manoharan* 16415 (CAL); South Arcot district, Parigam R.F., 27.12.1926, *Raju* 17906; Ulundurpet, 16.3.1961, *Sebastine* 12162 (MH); Gommuki dam area, 7.9.1977, *Ramamurthy* 50670; Tiruchirappalli district, near Sobanapuram R.H., 7.8.1958, *Sebastine* 6197 (CAL, MH); Tiruchi tollgate,

Ayyavaikkai, 24.2.1978, *Rajendran & Diraviam* 1225; Tirunelveli district, Tinnevely, 1867, *Beddome* s.n. (MH).

*Notes:* This species closely resembles *B. buxifolia* but differs in entire plant being glandular-hairy; flowers pedicellate and pink; outer sepals ovate-oblong and inner sepals slightly smaller than outer ones. Flowers open between 7 and 9 am and remain till the next day.

**Barleria noctiflora** L.f., Suppl. Pl.: 290. 1782; Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832 & in de Candolle, Prodr. 11: 239. 1847, excl. syn.; Anderson, J. Linn. Soc., Bot. 9: 490. 1867 (as *B. noctifolia*); Clarke in Hooker, Fl. Brit. India 4: 484. 1884; Gamble, Fl. Madras 2: 742. 1924; Matthew, Ill. Fl. Tamilnadu Carnatic: t. 522. 1982 & Fl. Tamilnadu Carnatic: 1165, t. 90i. 1983; Sharma *et al.*, Fl. Karnataka: 203. 1984; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 699. 1997; Daniel & Umamaheswari, Fl. Gulf Mannar: 423. 2001; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 5, 22a**

Type: India: König 1777 (Photo!, LINN).

*Barleriacanthus noctiflora* (L.f.) Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn: 136. 1854.

Vernacular Name: *Nagagorinta* (Telugu).

Undershrubs, perennial, up to 90 cm high. Stems terete, white-pilose; thorns leaf-opposed, often branched. Leaves clustered, sessile, obovate or spatulate, 1 – 4 × 0.4 – 1 cm, cuneate at base, ciliate at margins, acute-mucronate at apex, sparsely pubescent; lateral veins 4 or 5 pairs. Flower solitary, axillary, sessile; bracts spinescent, branched. Outer sepals elliptic-ovate, subequal, 1 – 2 × 0.5 – 1 cm, dentate and spinescent at margins, long-mucronate-spinescent at apex, pubescent outside, prominently palmately reticulate veined; inner sepals elliptic-lanceolate, 5 – 10 × 1 – 2 mm, ciliate at margins, acuminate at apex, glandular-pubescent outside, reticulately veined. Corolla 3.5 – 5 cm long, pubescent outside, dull white; tube 3 – 3.5 cm long; lobes ovate-obovate, subequal, 8 – 12 × 6 – 7 mm. Fertile stamens 2, exserted; filaments 1.5 – 2 cm long, hairy towards base, bluish above; anthers 2 – 3 mm long, bluish; sterile stamens 2, c. 4 mm long, hairy, bluish; staminode scaly. Disc covering  $\frac{2}{3}$  of ovary at base. Ovary ovoid, c. 3 mm long, glabrous; ovules 2 in each locule; style 2.5 – 3.5 cm long; stigma 2-lobed. Capsules ellipsoid, 12 – 16 × 4 – 6 mm, compressed. Seeds broadly ovoid, 4.5 – 5 × 3.5 – 4.2 mm, white or brown silky appressed-hairy.

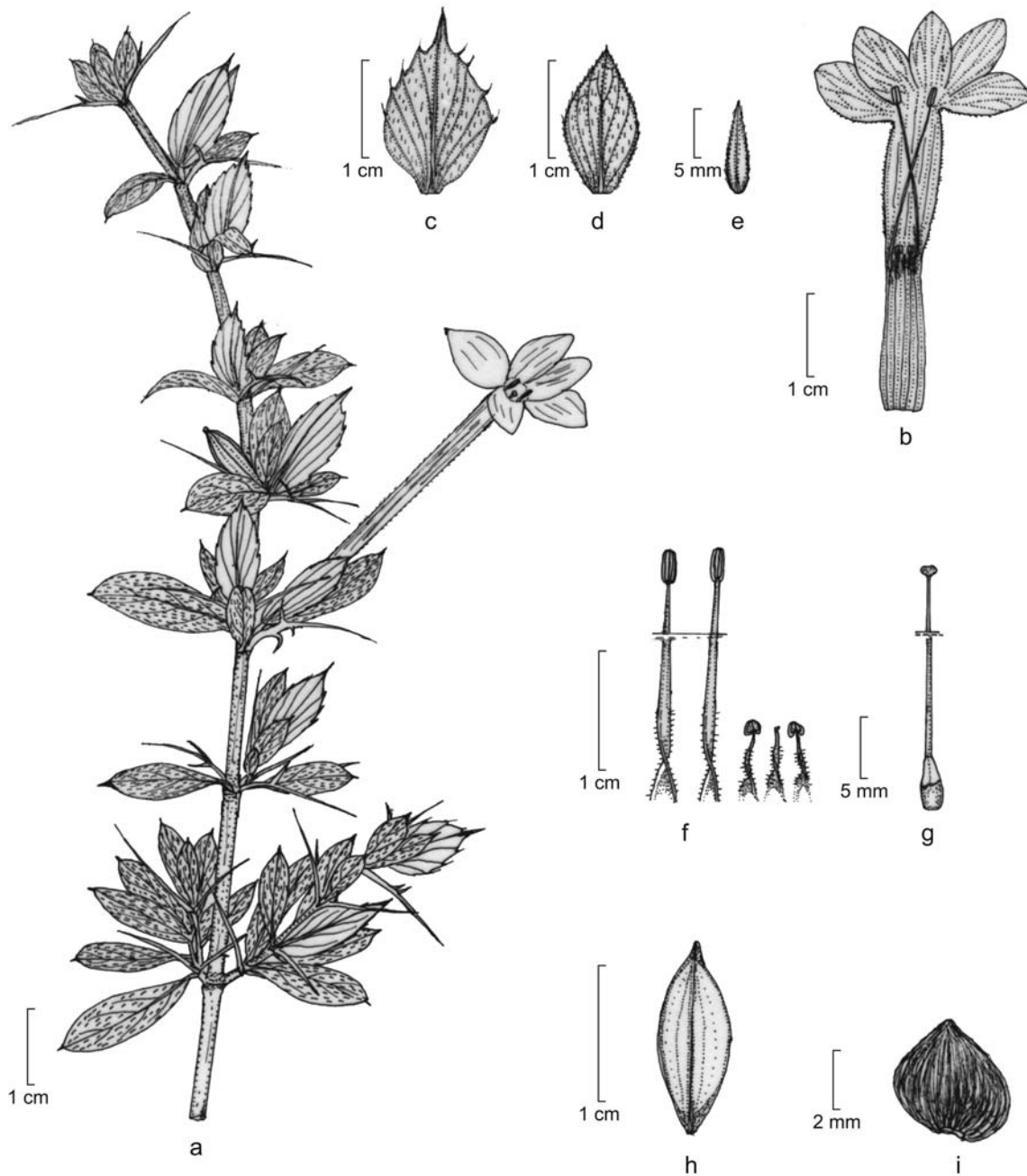


Fig. 5. *Barleria noctiflora* L.f.: a. Flowering twig; b. Corolla split open; c, d. Outer sepals; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

*Flowering & Fruiting*: July – February.

*Habitat*: Scrub forests at lower altitudes.

*Distribution*: World: India and Sri Lanka. India: Andhra Pradesh, Karnataka and Tamil Nadu.

*Specimens examined*: INDIA, **Andhra Pradesh**, Nellore district, Veligonda hills, Block B, 28.7.1914, *Ramaswami s.n.*; Cuddapah district, Rayachoti, July 1884, *Gamble s.n.* (CAL). **Tamil Nadu**, Coimbatore district, Shanikulam, 6.9.1899, *Barber* 806; Peelamedu, 5.8.1968, *Chandrabose* 30627;

Kanniyakumari district, near Anjugramam, 27.3.1979, *Henry* 61558 (MH); Madurai district, Bodinaikanur, December 1910, *Meebold* 13792 (CAL); Near forest R.H., Alagarcoil, 14.6.1957, *Subramanyam* 3501 (MH); Foot hills of Alagar, 29.1.2007, *Shendage* SMS2534 (SUK); North Arcot district, Vazhiyur, 26.3.1978, *Vajravelu* 54594; Pudukottai district, Narthamalai, 3.8.1984, *Arunlappan* 132; Ramanathapuram district, Melakadu forest, Sivaganga, 18.8.1964, *Ramamurthy* 20957; Sanjeevimalai, eastern slope, Rajapalayam,



28.9.1971, *Vajravelu* 38776; Gopalapuram, Puduppatti, 15.2.1979, *Nair* 57497; Tiruvadana, 18.9.1988, *BalaSubramanyam* 1832; On the way to Mandapasalai, 15.11.1989, *Balasubramaniam* 2232; Salem district, Morappur, 16.2.1915, *s. coll.* 11647; South Arcot district, Sivapakkam R.F., 8.9.1977, *Ramamurthy* 50698; Athipakkam forest, 10.2.1983, *Ramamurthy* 77476; Thanjavur district, Sikkal to Velankanni, 17.9.1977, *Ramamurthy* 51290; Nidamangalam, 31.5.1978, *Nair* 57204; Tirunelveli district, Alangkolam, 30.6.1901, *Barber* 3356; Koilpatti, 18.7.1901, *Barber* 3426; Tiger falls, way to Mancholai, 30.6.1957, *Sebastine* 3732; Sirukadu, 29.11.1961, *Sebastine* 13710 (MH).

*Notes:* This species closely resembles *B. acanthoides* Vahl but differs in its stunted habit and solitary, axillary flower. These two species are also geographically isolated. Flowers open at dusk and remain till the next day.

***Barleria pilosa*** B. Heyne ex Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832; Nees in de Candolle, Prodr. 11: 239. 1847; Anderson, J. Linn. Soc., Bot. 9: 491. 1867; Beddome, Icon. Pl. Ind. Or.: t. 256. 1872; Clarke in Hooker, Fl. Brit. India 4: 486. 1884; Gamble, Fl. Madras 2: 742. 1924; Kumari in Henry *et al.*, Fl. Tamil Nadu 2: 143. 1987; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 22b**

Lectotype: Wall., Numer. List No. 2502a (CAL)

Shrubs, 1 – 1.5 m high, much branched, glandular-pilose. Leaves ovate, 3.5 – 8.5 × 2 – 5.5 cm, rounded at base, ciliate at margins, acuminate at apex; petioles 2.5 – 4 cm long, hairy; lateral veins 5 or 6 pairs. Flowers solitary, axillary; pedicels c. 5 mm long; bracts linear, c. 1 cm long, ciliate at margins, reflexed, 1-veined. Outer sepals ovate or orbicular, subequal, 1.2 – 1.5 × 1 – 1.3 cm, ciliate-denticulate at margins; inner sepals linear-lanceolate, dentate at margins. Corolla 3.5 – 5 cm long, pale blue; tube c. 2.5 cm long, glabrous; lobes obovate, 8 – 12 mm long, hairy. Fertile stamens 2, exserted; filaments c. 1.5 cm long, glabrous; staminodes 3, apiculate. Ovary covered by disc at base, glabrous; stigma truncate. Capsules c. 1 cm long, blackish. Seeds flat, appressed with silky brown hairs.

*Flowering & Fruiting:* December – January.

*Distribution:* India: Tamil Nadu (Tirunelveli). Endemic.

*Specimens examined:* INDIA, Tamil Nadu, Tirunelveli district, S. Tirunelveli, *s. die*, Heyne 315 (Photo!, K); Herb. Heyne, Courtallum, *s. die*, (Wall.,

Numer. List No. 2502b) (CAL); Courtallum hills, *s. die*, Beddome *s.n.*; Papanasam hills, 1867, *Beddome s.n.*; Honey falls, Courtallum, 20.3.1958, *Subramanyam* 5599 (MH); Wall., Numer. List No. 2502a (CAL); Manimuthar, 3.7.2006, *Ganesan & Kottai Muthu* 5608 (Herbarium ATREE, Bengaluru).

*Notes:* This species was first collected by Heyne probably in 1830 from Courtallum and Papanasam Hills in Tirunelveli, Tamil Nadu. After about 130 years it was again collected from Courtallum, the type locality by Subramanyam in the year 1958. Recently, Ganesan & Kottaimuthu have collected this species from Manimuthar in Kalakkad and Mundanthurai Tiger Reserve in 2006. However, it needs further intensive explorations in the Western Ghats to assess its distribution, population size and threat status.

***Barleria repens*** Nees in de Candolle, Prodr. 11: 230. 1847; Anderson, J. Proc. Linn. Soc., Bot. 7: 31. 1864; Hooker, Bot. Mag. 103: t. 6954. 1887; Burkill & Clarke in Dyer, Fl. Trop. Africa 5: 166. 1900. **Fig. 22f**

Type: SE Africa, Raiza Island, *s. die*, *Forbes s.n.* (Photo!, K).

English Names: Coral Creeper, Red Barleria.

Herbs, perennial, prostrate, much branched. Stems terete, grooved, pubescent. Leaves elliptic or obovate, 4 – 7 × 2 – 3 cm, attenuate at base, ciliate at margins, acute at apex, glabrescent above, puberulous beneath; lateral veins 4 or 5 pairs; petioles 5 – 10 mm long. Flowers solitary or occasionally 2 or 3 in cymes, axillary; pedicels 4 – 6 mm long; bracts subopposite, linear, 3 – 8 × 1 – 2 mm, ciliate at margins, acute at apex, strigose outside, with a midrib. Outer sepals ovate, subequal, 2 – 3 × 1.5 – 2 cm, cordate at base, ciliate at margins; veins faintly reticulate, sparsely glandular-hairy outside; inner sepals linear-lanceolate, 5 – 8 × 1 – 2 mm, glandular-hairy at margins, acute at apex, glabrous inside; midrib glandular-hairy outside. Corolla 5.5 – 6.5 cm long, hairy outside, scarlet; tube 3.5 – 4 cm long, swollen at base, glabrous, white below; lobes suborbicular, subequal, 1 – 2 cm across; median lobe smaller than the rest. Fertile stamens 2, exserted; filaments 2.2 – 2.8 cm long; anthers 3 – 4 mm long, dark pink; sterile stamens 3 – 4 mm long; staminode scaly. Ovary 3 – 5 mm long, compressed, glandular-hairy at apex; style terete, 3.8 – 4.5 cm long, swollen at apex, glabrous, brown at base; stigma c. 1 mm long, sticky, 2-lobed. Capsules elliptic-lanceoloid, 1.5 – 2 cm long. Seeds suborbicular-ovate, 4.5 – 5 × 4.5 – 5.2 mm, subcordate at base, covered with appressed silky hairs.

*Flowering & Fruiting*: September – February.

*Distribution*: World: India, Tropical and subtropical Southeast Africa and USA. India: Karnataka and Maharashtra.

*Specimens examined*: INDIA, **Karnataka**, Bengaluru district, University of Agriculture Sciences campus, Bangalore, 14.3.2007, *Shendage* SMS2543 (SUK). **Maharashtra**, Kolhapur district, Kolhapur, 14.3.2006, *Shendage* SMS2529 (SUK).

*Notes*: This species is very distinct and can easily be identified by their scarlet flowers. This is one of the pretty *Barleria* species introduced in Indian gardens, for their scarlet flowers. The flowers open between 7.30 and 10.00 am and remain till the next day.

**Barleria tomentosa** Roth, Nov. Pl. Sp.: 314. 1821; Nees in Wallich, Pl. Asiat. Rar. 3: 92 1832 & in de Candolle, Prodr. 11: 233. 1847; Anderson, J. Linn. Soc., Bot. 9: 451. 1867; Clarke in Hooker, Fl. Brit. India 4: 485. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Cooke, Fl. Bombay 2: 459. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Gamble, Fl. Madras 2: 742. 1924; Matthew, Fl. Tamilnadu Carnatic: 1166. 1983; Sharma *et al.*, Fl. Karnataka: 203. 1984; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 700. 1997; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 340. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 15. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 8. 2009. **Fig. 6, 22i**

Type: India, Herb. Madras Wall., Numer. List No. 2503a (CAL!); Mysore, 22.11.1798, Herb. *Rottler s.n.* (K).

*Barleria racemosa* Wall., Numer. List No. 2503b. 1830.

Type: India, Travancore, Wall., Numer. List No. 2503b (CAL!).

*Barleria hirsuta* Wall., Numer. List No. 2503b. 1830.

Type: India, Herb. Madras, Wall., Numer. List No. 2503b (CAL!).

*Barleria paniculata* Wall. ex Nees in Wallich, Pl. Asiat. Rar. 3: 92. 1832; Nees in de Candolle, Prodr. 11: 233. 1847; Gamble, Fl. Madras 2: 742. 1924; Kumari in Henry *et al.*, Fl. Tamil Nadu 2: 143. 1987; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009, **syn. nov.**

Type: Travancore, Wall., Numer. List No. 2407 (CAL).

*Barleria tomentosa* Roth var. *glandulosa* C.E.C. Fisch., Rec. Bot. Surv. India 9: 135. 1921; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 8. 2009, **syn. nov.**

Shrubs, perennial, erect, up to 1 m high. Stems terete, hirsute-tomentose with glandular and eglandular hairs. Leaves broadly ovate, 4 – 8.5 × 2 – 4.5 cm, rounded at base, acuminate at apex, tomentose, densely so on veins; petioles 0.5 – 2.5 cm long, glandular-tomentose; veins 5 or 6 pairs. Flowers solitary or 2 or 3, axillary, c. 6 cm long; peduncles 0.5 – 1.8 cm long, sparsely glandular-hairy; bracts linear-lanceolate, 10 – 15 × 1 – 2 mm, foliaceous, larger than calyx lobes, glandular-hairy above, strigose beneath on midrib. Sepals scarious, hairy at base outside, variegated with green veins; outer sepals linear or obovate-oblong, subequal, 10 – 15 × 2 – 3 mm, acute-apiculate at apex, one of the sepals often bifid; midrib strigose outside, strigulose inside, glandular-hairy at margin; inner sepals linear-lanceolate, 6 – 8 × 2 – 3 mm, glandular-hairy at margins, apiculate at apex. Corolla infundibuliform, hairy outside, faint blue, dark at throat; tube c. 4 cm long, purple; lobes ovate or elliptic, subequal, 1.5 – 2.5 × 1 – 2 cm, emarginate at apex, tomentose outside. Fertile stamens 2, exserted; filaments 2 – 2.5 cm long, bluish at base; anthers c. 6 mm long; staminodes 3, 0.5 – 1 mm long. Ovary ovoid, c. 3 mm long, glabrous. Disc covering less than ¼ of ovary at base; style terete, 5.4 – 5.8 cm long, hairy at base; stigma papillate, sticky, 2-lobed, pink. Capsules obovoid, 1.4 – 1.6 × 0.5 – 0.6 cm, glabrous, 4-seeded; lower 2 seeds some time suppressed. Seeds triangular, 5.5 – 6.5 × 4.8 – 5.2 mm, appressed silky hairy.

*Flowering & Fruiting*: September – February.

*Habitat*: Rocky crevices in drier regions.

*Distribution*: India: Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Endemic.

*Specimens examined*: INDIA, Westren India, *s. die*, Gibson *s.n.* (CAL); **Andhra Pradesh**, Nalaconda district, Bottichalami, 15.12.1959, *Sebastine* 9793; Nagarjuna Konda valley, 26.11.1961, *Dhothallure* 9775 (CAL). **Karnataka**, Bijapur district, Badami, 17.10.1892, *Talbot* 2756; Kellur R.F., 18.1.1970, *Hungund Singh* 142600; Mustigre R.F., Badami, 12.11.1975, *Singh* 141652; Badami, 9.10. 2005, *Shendage* SMS2501 (SUK); Chikmagalur district, Bababoodhan hills, *s. die*, *Law s.n.* (CAL); Raichur district, Koppal S.F. I, 15.1.1976, *Singh* 142499 (BSI). **Kerala**, Idduki district, Panamkutti, 18.12.1982, *Mohan* 76192 (MH); Palakkad district, Walar, 6.1.1911, *Fischer* 2440 (BSI, CAL); Pothundy to Kaikathy, 21.11.1973, *Vajravelu* 44738; Thrissur district, Perambicolam, November 1910, *Meebold s.n.* (CAL). **Others**, Sanapur reservoir, Gangavati, 12.2.1975, *Singh* 129832 (BSI).

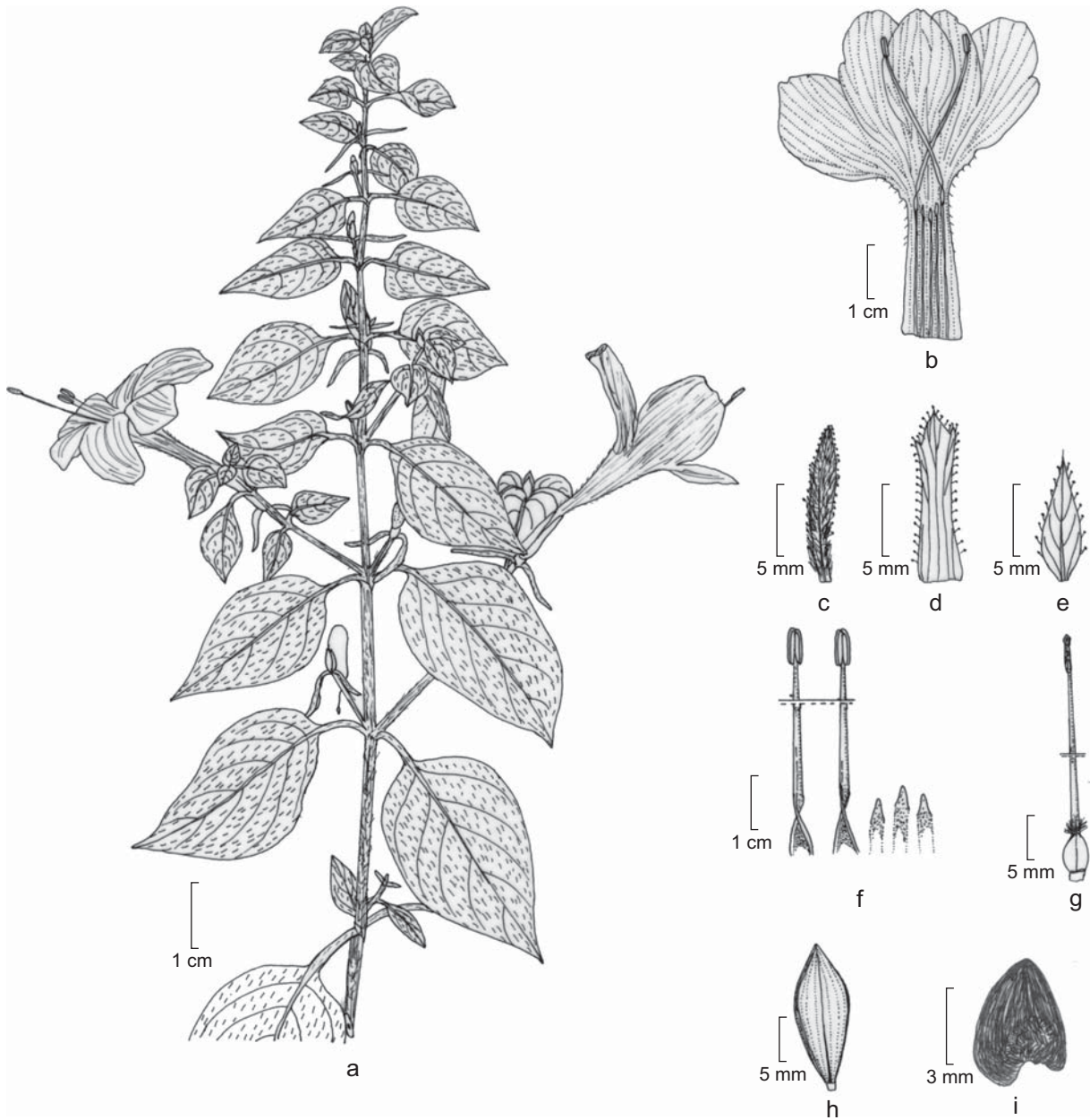


Fig. 6. *Barleria tomentosa* Roth: a. Flowering twig; b. Corolla split open; c. Bract; d. Outer sepal; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

*Note:* This species closely resembles *B. acuminata* Nees, but differs by broadly ovate, tomentose leaves and small infundibuliform corolla. Flowers open between 12.00 noon and 2.00 pm and remain next two days.

**Section: Chrysothrix** M. Balkwill

**Key to the species**

- 1. Outer sepals dentate ..... 2
- 1. Outer sepals entire ..... 3

- 2. Leaves 9 – 16 cm long; flowers blue; filaments and style hairy ..... **B. strigosa**
- 2. Leaves 3.5 – 7 cm long; flowers white; filaments and style glabrous ..... **B. nitida**
- 3. Bracts as long as or longer than outer sepals ..... **B. acuminata**
- 3. Bracts shorter than outer sepals ..... 4
- 4. Inflorescence strigose-hairy; ovary and capsule glabrous ..... 5
- 4. Inflorescence appressed or glandular-hairy; ovary and capsule hairy at apex..... 6



5. Bracts elliptic-lanceolate, not cupular-glandular; stamens hairy ..... **B. terminalis**
5. Bracts linear, cupular-glandular; stamens glabrous ..... **B. lawii**
6. Leaves hairy; inflorescence in axillary lax spike; stamens with glandular hairs..... **B. involucreta**
6. Leaves glabrous; inflorescence in terminal dense spikes; stamens without glandular hairs .....7
7. Inflorescence with glandular hairs; outer sepals elliptic-ovate; capsules 1.5 – 2 cm long ..... **B. courtallica**
7. Inflorescence without glandular hairs; outer sepals lanceolate; capsules 3 – 4 cm long ..... **B. vestita**

**Barleria acuminata** Wight ex Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832; Wight, Icon. Pl. Ind. Orient. 2: 3, t. 450. 1841; Nees in de Candolle, Prodr. 11: 234. 1847; Gamble, Fl. Madras 2: 742. 1924; Matthew, Fl. Tamilnadu Carnatic: 1159, t. 90a. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 441. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 696. 1997; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl.: 338. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 13. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 5. 2009. **Fig. 7, 20b**

Type: Wight, Herb. Prop. Madras, 2503c (CAL!).

*Barleria tomentosa* Roth var. *acuminata* (Wight ex Nees) C.B. Clarke in Hooker, Fl. Brit. India 4: 485. 1884.

Shrubs, perennial, erect, up to 2.5 m high, stellate-tomentose mixed with glandular hairs. Leaves ovate, 5 – 12 × 4 – 8.5 cm, truncate to rounded at base, entire at margins, acute at apex; petioles 2.5 – 4 cm long; lateral veins 6 – 8 pairs. Flowers axillary or in terminal scorpioid cymes, 4.5 – 5 cm long; peduncles *c.* 6 mm long; bracts linear-lanceolate or spathulate, 1 – 2 × 0.1 – 0.3 cm, acuminate at apex. Sepals scarious, hairy outside, variegated with green veins; outer sepals linear-oblong, subequal, 1.2 – 1.8 × 0.2 – 0.6 cm, glandular-hairy at margins, acuminate at apex; inner sepals triangular, 5 – 10 × 1 – 2 mm, glandular-hairy at margins, acuminate at apex. Corolla 3.5 – 5 cm long, pubescent outside, faint blue; lobes oblong-obovate, subequal, 10 – 15 × 8 – 14 mm, emarginate at apex, pubescent outside; tube 3 – 4 cm long. Fertile stamens 2, exserted; filaments 5 – 10 mm long, hairy, bluish; anthers 3 – 5 mm long, blue; sterile stamens 2, *c.* 1 mm long, hairy; staminode 1, scaly, hairy. Disc covering about ½ part of ovary at base. Ovary ovoid, 3 – 4 mm long, hirsute above; style terete, 3.5 – 4.5 cm long, hirsute at base; stigma *c.* 1 mm long, 2-lobed.

Capsules ellipsoid, 1 – 2 × 0.5 – 0.7 cm, compressed, hirsute at apex, 4-seeded. Seeds broadly suborbicular-ovate, 4 – 4.8 × 4.2 – 5 mm, subcordate or truncate at base, clothed with brownish appressed hairs.

*Flowering & Fruiting*: September – February.

*Habitat*: Open hilly regions as well as on roadsides.

*Distribution*: India: Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Endemic.

*Specimens examined*: INDIA, **Karnataka**, Bellary district, Kudligi-Sandur road, 10.1.1980, *Ramesh & Manohar* 10695; Mysore district, Madheswara hills, 6.3.1979, *Manohar & Sreenath* 6371 (CAL). **Tamil Nadu**, Coimbatore district, North & working circle, Bolampatti valley, 10.12.1909, *Fischer* 1513; Kuridimalai, 13.8.1956, *Subramanyam* 527; Thekkumalai, 19.11.1956, *Sebastine* 1352 (CAL, MH); Near Attakatti – Anamalais, 14.12.1960, *Balakrishnan & Ellis* 11711; Aliyar submergible area, 24.11.1962, *Sebastine* 15338 (CAL); Madurai district, Karandamallai hills, 15.2.1958, *Subramanyam* 5323 (MH); Way to Pachakumatchi, 27.6.1959, *Subramanyam* 8247; Combai, 11.6.1961, *Sebastine* 12570; Thalaiyar HEP area, 17.10.1986, *Ramamurthy* 51572 (CAL, MH); Varadhamanadhi MHEP, 24.7.1987, *Ramamurthy* 85983 (CAL); Karandamalai hills, 30.1.2007, *Shendage* SMS2537 (SUK); Nilgiri district, Kallar, December 1886, *Gamble* 18520; Kunjapanai slopes, 10.8.1970, *Vajravelu* 35277; East & Northeast of Sirur, 19.11.1970, *Subba Rao* 37281; Salem district, Hogainakkal forest, 25.11.1964, *Vajravelu* 21939 (MH); Mettur dam, Sitamalai, 6.12.1978, *Matthew* 19707 (CAL); Ramanathapuram district, Puduppatti beat, 8.12.1971, *Vajravelu* 39303 (MH); Tiruvallagapperumal kuttaw, 16.2.1979, *Nair* 60848 (CAL, MH); Tirunelveli district, sea coast, June 1835, *Wight* 2635 (CAL); Virudhunagar district, Way to Sunaiprambu, Sethur hills, 24.4.1991, *Srinivasan* 96714 (MH).

*Notes*: Roth in 1821 described a new species, *B. tomentosa* based on collections 2503a, 2503b and 2503c made by Wight and others. Nees described *B. acuminata* based on specimen 2503c collected by Wight. Clarke (1884) reduced *B. acuminata* as a variety of *B. tomentosa*. Critical observations in the field, plants grown in the garden and herbarium comparison reveal that *B. acuminata* is a distinct species. This species closely resembles *B. tomentosa* Roth, but differs in having deltoid-ovate leaves with stellate hairs (also found in *B. longiflora*), large corolla and capsule, corolla tube narrowly tubular



Fig. 7. *Barleria acuminata* Wight ex Nees: a. Flowering twig; b. Corolla split open; c, d. Bracts; e. Outer sepal; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

enlarging upward. *B. tomentosa* has broadly ovate leaves without stellate hairs, shorter and small corolla and funnel shaped tube.

***Barleria courtallica*** Nees in de Candolle, Prodr. 11: 226. 1847; Wight, Icon. Pl. Ind. Orient. 4: 4, t. 1529. 1850; Dalzell & Gibson, Bombay Fl.: 188. 1861; Anderson, J. Linn. Soc., Bot. 9: 493. 1867; Clarke

in Hooker, Fl. Brit. India 4: 489. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902; Cooke, Fl. Bombay 2: 462. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Gamble, Fl. Madras 2: 743. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 61. 1952; Matthew, Fl. Tamilnadu Carnatic: 1160. 1983 & Fur. III. Fl. Tamilnadu Carnatic: 443. 1988; Sharma *et al.*, Fl.

Karnataka: 202. 1984; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 290. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 598. 2001; Almeida, Fl. Maharashtra 4(A): 10, f. 7. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 13. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 5. 2009. **Fig. 8, 20d**

Type: India, Courtallum, March 1835, Wight, Herb. Prop. 655 (CAL!).

*Barleria nutans* Nees in de Candolle, Prodr. 11: 227. 1847; Clarke in Hooker, Fl. Brit. India 4: 488. 1884, **syn. nov.**

Lectotype (designated here): Ceylon, Hantane, *Champion s.n.* (Photo!, K).

Vernacular Names: *Venkurunji* (Malayalam); *Cheth-asahacharam* (Sanskrit).

Shrubs, perennial, erect, *c.* 1.5 m high, much branched, glandular-pubescent when young.

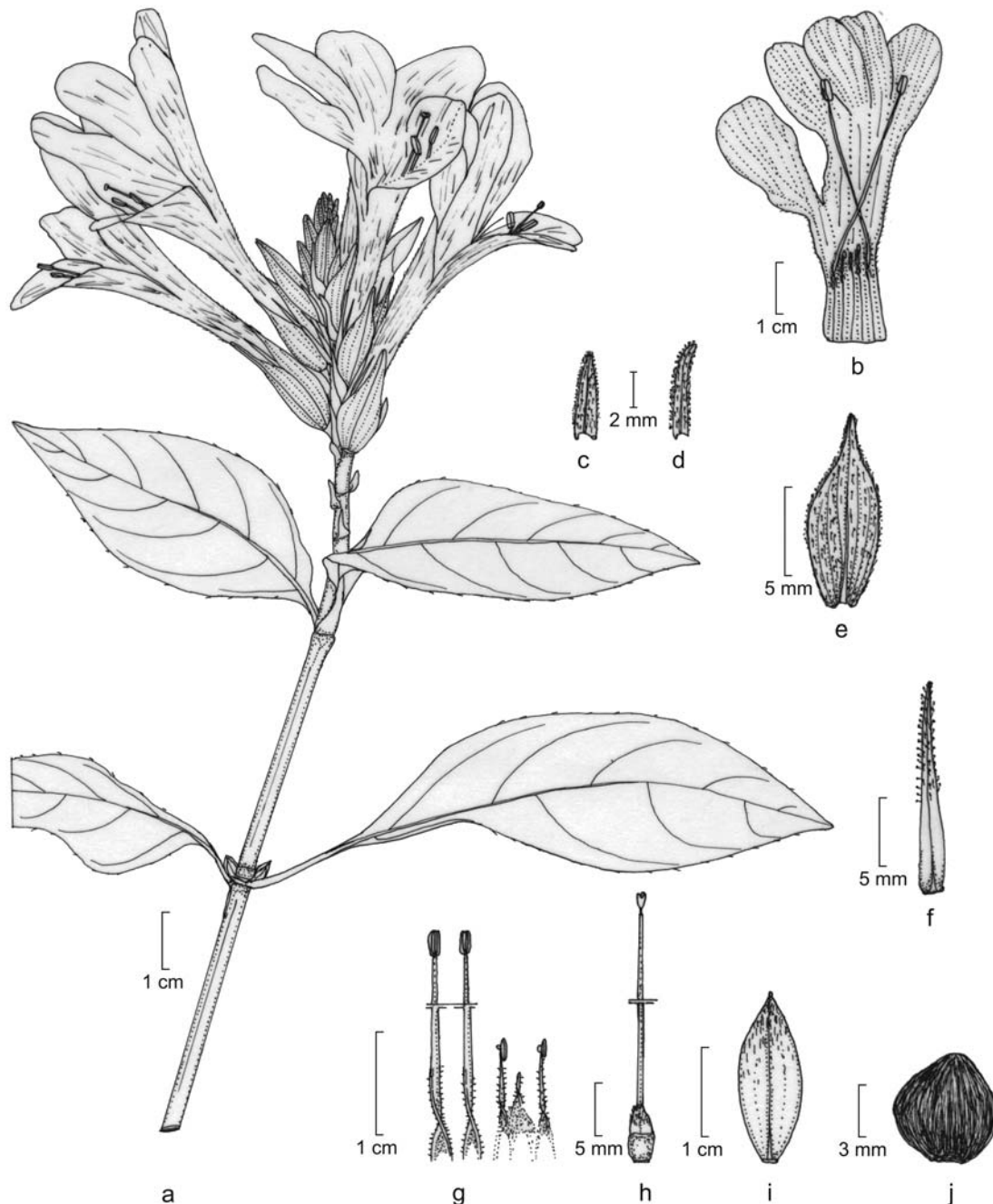


Fig. 8. *Barleria courtallica* Nees: a. Flowering twig; b. Corolla split open; c, d. Bracts; e. Outer sepal; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.



Stems terete, glabrous. Leaves elliptic-lanceolate, 12 – 20 × 4.5 – 8 cm, entire, recurved at margins, acuminate at apex, glabrous; petioles 0.5 – 3 cm long; lateral veins 6 – 9 pairs. Flowers in dense axillary or terminal narrow spikes, up to 10 cm long; bracts linear-lanceolate, 3 – 6 × 1 – 1.5 mm, acute at apex, glandular-pubescent outside, appressed-hairy inside; midrib dark brown; bracteoles linear-lanceolate, 8 – 12 × 1 – 2 mm, acute at apex, appressed-hairy inside, glandular-pubescent outside. Outer sepals elliptic-ovate, subequal, 1.5 – 2 × 0.5 – 1 cm, ciliate at margins, acuminate at apex, appressed-hairy inside, densely glandular-pubescent outside, 9 – 11-veined; inner sepals linear-lanceolate, as long as outer sepals, 1 – 2 mm across, usually projecting outside from the outer sepals, ciliate at margins, acuminate at apex, glandular-pubescent outside. Corolla 4 – 6.5 cm long, glandular-pubescent outside, blue; tube 2.5 – 3.2 cm long, hairy inside at point of insertion of filaments, yellow; lobes oblong-obovate, subequal, 1.5 – 2.2 × 0.6 – 2 cm, emarginate at apex. Fertile stamens 2, exserted; filaments 3 – 4 cm long, retrorse-hairy from half below, yellowish; anthers c. 5 mm long; sterile stamens 2, 3 – 4 mm long; filaments hairy; anthers 1-loculed; staminode less than 1 mm long, scaly. Disc covering about  $\frac{2}{3}$  of basal part of ovary. Ovary oblongoid, 3 – 5 mm long, hairy above; style slender, 3 – 5 cm long; stigma c. 1 mm long, 2-lobed. Capsules ellipsoid, 1.5 – 2 × 0.7 – 0.8 cm, hairy at apex. Seeds broadly ovate, 4.5 – 6 × 5 – 6.5 mm, clothed with brown to black appressed-hairs.

*Flowering & Fruiting:* December – April.

*Habitat:* Deep shade localities along streams in moist evergreen and semi-evergreen forests at higher altitudes.

*Distribution:* World: India and Sri Lanka. India: Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra and Tamil Nadu.

*Specimens examined:* INDIA, Concan, *s. die*, *Stocks & Law s.n.* (MH); Chenathnar, 22.1.1910, *Fischer s.n.* (CAL). **Andhra Pradesh**, Godavari district, Rampa hills, 2.1885, *Gamble* 16035 (BSI, CAL, MH). **Karnataka**, Chickmagalur district, Bababudan hills, *s. die*, *Law* 1529; Coorg district, Lower reverine of Thodiandamol, 10.2.1976, *Banerjee* 11617; Hassan district, Stream between Devalkere & Devarunde, 28.1.1971, *Ramamoorthy* 1379; Karwar district, Karwar, 1866, *Beddome s.n.* (MH); Karwar, April 1883, *Talbot* 442 (CAL); Yellapur, 1884, *Talbot* 7240 (BSI); Ulvi, 22.1.2006, *Shendage* SMS2544; Ulvi, 17.2.2008, *Shendage* SMS2545 (SUK); Mysore

district, Someshwar ghat, 6.2.1961, *Raghavan* 69380; Shimoga district, Ghat road, Agumbe, *s. die*, *Raghavan* 97247 (CAL); Kolar – Tirthahally Road, 5.2.2007, *Shendage* SMS2540 (SUK); South Kanara district, Subrahmanya, 28.1.1978, *Raghavan* 152041 (BSI). **Kerala**, Travancore, Kevi, 13.1.1894, *Bourdillon* 36 (MH); Travancore, 13.1.1894, *Bourdillon s.n.*; Ariankam – Immalai, 22.3.1915, *Calder s.n.*; Karpauter, 29.3.1915, *Calder s.n.*; Ernakulam district, Bhagavathikulam, Maiyattor R.F., 10.2.1970, *Shetty* 33460 (MH); Idukki district, Shembagavalli weir, 20.2.1982, *Mohanan* 73404; Meenmutty-Kulamavu, 12.12.1982, *Mohanan* 76021; Painavu, 18.2.1983, *Mohanan* 76237 (CAL); Meenmutty – Kulamavu, 25.2.1984, *Pandurangan* 78092 (MH); Kannur district, Kannothe R.F., Kannavam, *s. die*, *Ramachandran* 54013; Chembakar, 20.1.1979, *Nair & Ansari* 59706; Ambayathoote, 20.2.1979, *Ramachandran* 60042 (CAL, MH); Chandanathode, 22.2.1979, *Ramachandran* 61311 (CAL); Kollam district, Palode reservoir, *s. die*, *Puri* 15177 (BSI); Naduvanoorkadavu, 18.2.1989, *Mohanan* 61143 (CAL, MH); Kottayam district, Pulluparai, 22.1.1965, *Vivekananthan* 22947; Malappuram district, Mancheri, 28.2.1970, *Ellis* 33622 (MH); Palakkad district, Kakkapadi shola, Attapadi valley, 25.1.1911, *Fischer* 2482 (CAL); Mandhampatti forest, Mukkali, 12.1.1979, *Vajravelu* 59124 (CAL, MH); Way to Valiyaparathode, S.V.R.F., 7.10.1979, *Nair* 64377 (MH); Silent Valley eastern slope, 17.1.1980, *Bhargavan* 65529 (CAL, MH); Pathanamthitta district, Upper Moozhiar coodikal F/R, 23.12.1988, *Anil Kumar* 1214 (CAL); Moozhiar forest, 26.1.1992, *Chandrasekaran* 96681; Thiruvananthapuram district, Vicinity of Poringalkuthu, 2.2.1953, *Fernandes* 201 (CAL); Near Adhirumalai, way to Agastyar Kudam, 5.3.1980, *Mohanan* 66068 (MH). **Maharashtra**, Pune district, Wagioi forest-Nandgaon-Ambavne, 30.3.1964, *Reddi* 97659 (BSI, CAL). **Tamil Nadu**, Coimbatore district, Anamalai slopes, 13.12.1909, *Fischer* 1453 (CAL); Kannyakumari district, Beyond Kandakki estate, Panagudi, 6.3.1972, *Sharma* 39978 (MH); Balamore to M.K. Vayal, 18.1.1978, *Henry* 52405 (CAL); Kilaviarumalai, Balamore, 20.3.1979, *Henry* 60788 (CAL, MH); Madurai district, Karandamalai hills, 31.1.2007, *Shendage* SMS2540 (SUK); Nilgiri district, Pandalur-Devala, 27.2.1973, *Vajravelu* 43759 (MH); Tiruchirappalli district, Pachaimalais, Kootathumadavu, 17.3.1978, *Matthew* 12378 (CAL); Tirunelveli district, Mancholai, 1.3.1958, *Sebastine* 5457; Mini estate way-fire falls, Courtallam forest, 18.2.1983, *Vajravelu* 76582 (CAL, MH); Kannikatti, way to Poonkulam, 24.4.1990, *Gopalan* 93245; Peedakkadu, 1.4.1991, *Gopalan* 91778 (MH).

*Notes:* This species has flowers of ornamental value and is very distinct and can be easily recognised by corolla with blue limb and yellow tube.

**Barleria involucrata** Nees in Wallich, Pl. Asiat. Rar. 3: 92. 1832 & in de Candolle, Prodr. 11: 232. 1847; Wight, Illustr. Ind. Bot.: t. 164. 1850; Anderson, J. Linn. Soc., Bot. 9: 492. 1867; Clarke in Hooker, Fl. Brit. India 4: 485. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Cramer in Dassanayake, Rev. Handb. Fl. Ceylon : 88. 1998; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

Lectotype: Wall., Numer. List No. 2509c (K, WALL). (Cramer, 1998)

*Barleria pentandra* Arn. ex Nees in de Candolle, Prodr. 11: 232. 1847.

### Key to the varieties

1. Flowers 5 – 7 cm long; corolla blue with white tube ..... var. **involucrata**
1. Flowers 9 – 12 cm long; corolla pinkish with reddish purple tube ..... var. **elata**

**Barleria involucrata** Nees var. **involucrata**: Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 13. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

### Fig. 21c

Shrubs, perennial, erect, up to 1.5 m high. Stems terete, swollen at nodes, sparsely appressed-hairy. Leaves elliptic-lanceolate, 8 – 16 × 2.5 – 8 cm, acute to attenuate at base, appressed-hairy at margins, acuminate at apex, sparsely pubescent; lateral veins 7 or 8 pairs; petioles 1 – 6 cm long, appressed-hairy. Flowers solitary, 5 – 7 cm long, axillary or in scorpioid cymes or often forming a large terminal panicles; peduncles 5 – 10 mm long; bracts linear-elliptic, 1 – 2.5 × 0.2 – 1 cm, curved, with prominent midrib, appressed-hairy; bracteoles linear-lanceolate, c. 1 × 0.2 – 0.5 cm, curved, with prominent midrib, appressed-hairy. Outer sepals subequal; anticus lanceolate, 2.5 – 3.5 × 0.8 – 1.5 cm, deeply lobed at apex; inner sepals narrowly linear-lanceolate, 1.5 – 2 × c. 0.4 cm, acute at apex, appressed-hairy. Corolla glandular-pubescent outside, pale to dark blue; tube 3 – 4.5 cm long, white; lobes oblong or obovate, 2 – 3 × 1 – 1.5 cm, obtuse to acute at apex. Fertile stamens 2, exserted; filaments 3.5 – 5 cm long, glandular-pilose towards base; anthers c. 5 mm long; sterile stamens 2, 5 – 8 mm long; staminode scaly; filaments glandular-pilose at base. Disc covering more than ½ of ovary. Ovary ovoid, c. 5 × 3 mm, hirsute at apex; style 5.5 – 6.5 cm long;

stigma linear, c. 2 mm long, smooth, sticky. Capsules ellipsoid, 2.5 – 3.2 × 0.8 – 1 cm, pubescent at apex. Seeds ovate or suborbicular, 9 – 10 × 8 – 9 mm, silky-hairy.

*Flowering & Fruiting:* October – March.

*Habitat:* Along roadsides at higher altitudes.

*Distribution:* World: India and Sri Lanka. India: Western Ghats of Karnataka and Kerala.

*Specimens examined:* INDIA, Peninsula Indiae Orientalis, 1866 – 68, Wight *s.n.* (CAL). **Karnataka**, Chickmagalur district, Bababudon hills, *s. die*, Law *s.n.* (CAL); Bababuddan hill, 21.12.2008, Shendage SMS2553 (SUK).

**Barleria involucrata** Nees var. **elata** (Dalzell) C.B. Clarke in Hooker, Fl. Brit. India 4: 486. 1884; Cooke, Fl. Bombay 2: 461. 1904; Talbot, For. Fl. Bombay 2: 335. 1911; Gamble, Fl. Madras 2: 742. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 60. 1952; Saldanha & Nicolson, Fl. Hassan: 544. 1976; Matthew, Fl. Tamilnadu Carnatic: 1163, t. 90e. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 445. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Kumari in Henry *et al.*, Fl. Tamil Nadu 2: 142. 1987; Manilal, Fl. Silent Valley: 202. 1988; Kulkarni, Fl. Sindhudurg: 320. 1988; Almeida, Fl. Savantwadi: 317. 1990; Vajravelu, Fl. Palghat: 345. 1990; Matthew, Fl. Palni Hills: 932. 1999; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 601. 2001; Almeida, Fl. Maharashtra 4(A): 13. 2003; Manjunath *et al.*, Fl. Davanagere: 301. 2004; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

*Barleria elata* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 227, 1851; Dalzell & Gibson, Bombay Fl.: 189. 1861; Talbot, Syst. List. Trees Bombay 2: 266. 1902.

### Fig. 9, 21b

Type: Wall., Herb. No. 2509h.

Shrubs, perennial, erect, up to 1.8 m high. Stems terete, swollen at nodes, appressed-hairy, blackish. Leaves broadly elliptic-lanceolate, 8 – 20 × 3 – 10.5 cm, tapering towards base, appressed-hairy at margins, acuminate at apex, glandular beneath, more or less pubescent; lateral veins 8 – 10 pairs; petioles 1 – 8 cm long, appressed-hairy. Flowers in scorpioid cymes, often forming a large terminal panicles, 9 – 12 cm long; peduncles 5 – 10 mm long; bracts linear-lanceolate, 1.5 – 2 × 0.2 – 0.5 cm, appressed-hairy at margins, acuminate at apex, curved, appressed-hairy beneath, with a prominent midrib; bracteoles

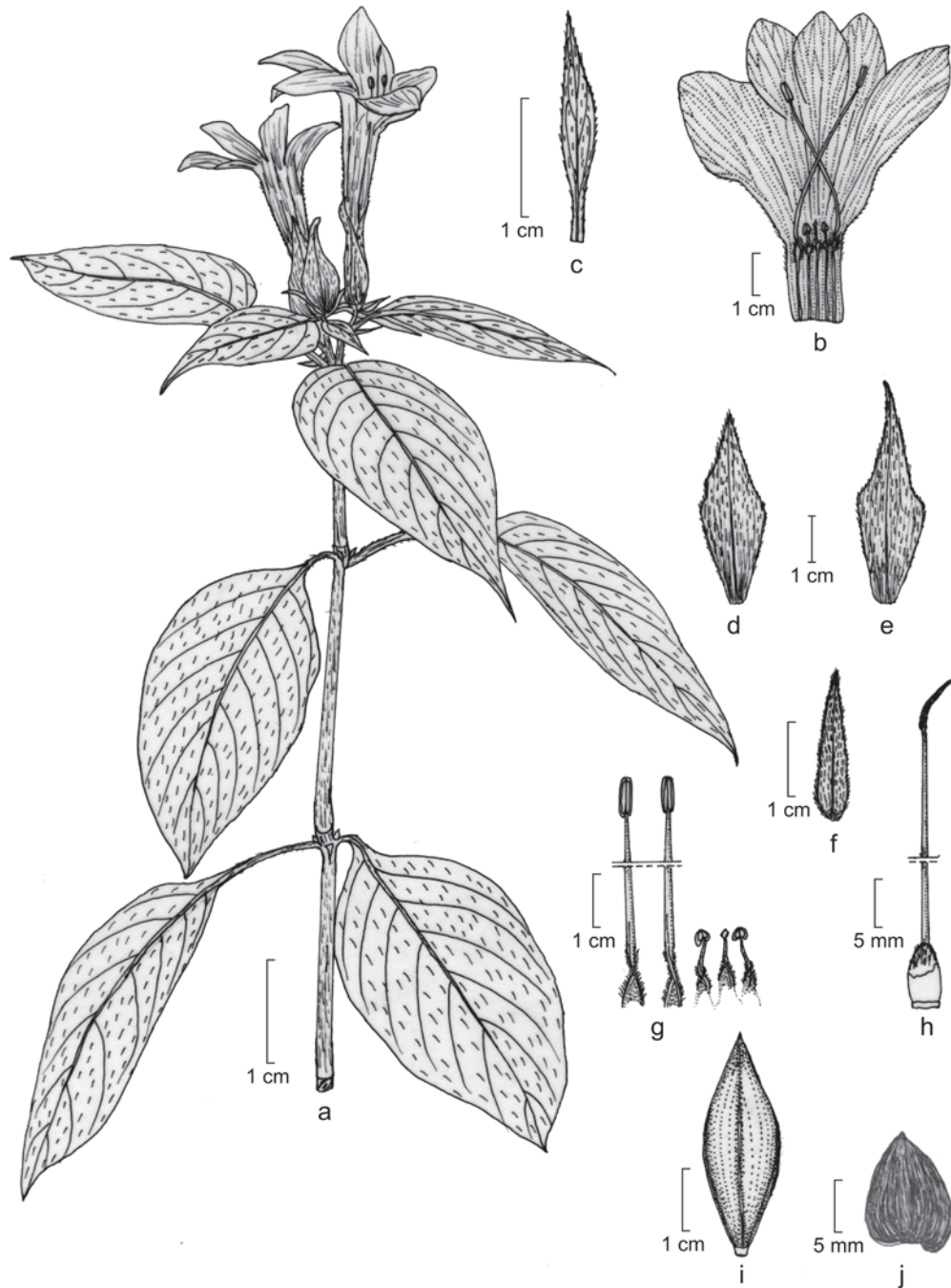


Fig. 9. *Barleria involuocrata* Nees var. *elata* (Dalzell) C.B. Clarke: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

linear-lanceolate, 1 – 1.5 × c. 0.2 cm, appressed-hairy beneath and at margins. Outer sepals subequal; anticous ovate-lanceolate, 3.5 – 5.5 × 1 – 1.5 cm, long-acuminate at apex; posticus ovate-lanceolate, 3 – 4 × c. 1 cm, acute-acuminate at apex; inner sepals linear-lanceolate, 1.5 – 2 × c. 0.4 cm, acute at apex, hairy outside. Corolla glandular-pubescent outside, pale blue to violet, reddish purple at throat; tube 5 – 6.5 cm long, widening above, reddish purple; lobes obovate,

3 – 4 × 1.5 – 3 cm, obtuse-emarginate at apex. Fertile stamens 2, exserted; filaments 5.5 – 6.2 cm long, glandular-pilose at base; anthers c. 8 mm long, dark brown; sterile stamens 2, 6 – 8 mm long; staminode deltoid at apex, scaly; filaments glandular-pilose at base. Disc covering more than ½ of ovary. Ovary ovoid, c. 6 × 3 mm, hirsute at apex; style terete, 7.5 – 8.5 cm long; stigma linear, c. 3 mm long, smooth, sticky. Capsules ellipsoid, 2.5 – 3.8 × 0.9 – 1.2 cm, pubescent at apex.



Seeds ovate or suborbicular, 9 – 12 × 8 – 10 mm, silky-hairy.

*Flowering & Fruiting*: October – March.

*Habitat*: Along roadsides at higher altitudes.

*Distribution*: India: Western Ghats of Karnataka, Kerala, Maharashtra and Tamil Nadu. Endemic.

*Specimens examined*: INDIA, **Karnataka**, On the way to Dattatreya peetha, 18.11.1978, *Takhtajan & Saldanha* 4640; Coorg district, Thodiandamol, 10.2.1976, *Banerjee* 11603; Karwar district, Karwar, November 1881, *Talbot* 88; Shimoga district, Castle rock, 24.10.1902, *Gammie* 15549 (BSI); Tirthahalli, 30.9.1962, *Raghavan* 82820; Yedur, 4.10.1962, *Raghavan* 82931 (CAL). **Kerala**, Devicolam, September 1910, *Meebold s.n.*; Santhanpara, December 1910, *Meebold s.n.*; Malabar, Guave, Attapadi hill, 29.1.1918, *Fischer* 2508 (CAL). Kannur district, Chandanthode, 15.2.1978, *Ramachandran* 53976; Way to Panoth, 13.11.1978, *Ramachandran* 58712 (CAL, MH); Kollam district, Chokkanpatty hills, 21.2.1982, *Mohanan* 73417; Palakkad district, Silent Valley R.F., 10.10.1965, *Vajravelu* 26070 (MH); Shola below Ayyappankovil area, 27.10.1976, *Vajravelu* 48728 (CAL, MH); Aruvampara R.F., 6.12.1980, *Nair* 69144 (CAL); Pathanamthitta district, Pannikkunnu forest, 26.1.1992, *Chandrasekaran* 96679 (MH); Thrissur district, Poringalkuttu – Sholaiyar forest, 25.11.1982, *Ramamurthy* 75526 (CAL); Thiruvananthapuram district, Western slope of Agastyamalai, 6.10.1973, *Joseph* 44592 (MH); Ponmudi hill, opposite T.B., 17.11.1977, *Mohanan* 52562; Way to Chemungi, 8.3.1979, *Mohanan* 61730 (CAL, MH). **Maharashtra**, Kolhapur district, *s. die*, *Sardesai* 1138 (SUK); Pune district, Bhimashankar, 15.12.1906, *Talbot* 5032 (BSI); Sindhudurg district, Amboli ghat, 11.12.2005, *Shendage* SMS2521 (SUK); Thane district, Kedarnath slope, Higarh, 17.11.1968, *Billore* 115541 (BSI, CAL). **Tamil Nadu**, Coimbatore district, Valparai estate surrounding, 15.3.1960, *Rao* 61320 (BSI); Attakatti – Valparai, Anamalais, 14.12.1960, *Balakrishnan & Ellis* 11787 (CAL); Kavarkal, 23.1.1962, *Joseph* 13749; Kurudimalai north slope, 6.10.1970, *Viswanathan* MVV792 (MH); Kanniyakumari district, Way to Valve house, Upper Kodayar, 30.9.1980, *Henry* 68878 (CAL, MH); Right flank, Saddle No. 3, Selvam Koopa, 17.2.1983, *Henry* 77036 (MH); Way to Nalumukku from Upper Kodayar, 25.3.1984, *Gopalan* 81442 (CAL); Madurai district, Aruna estate, 25.10.1959, *Subramanyam* 9519; Perumalmalai, 24.10.1977, *Chandrabose* 51657 (CAL, MH); Nilgiri district, Coonoor ghat, 1883, *Lawson s.n.* (MH); Coonoor ghat, September 1883, *Gamble* 12325; Koragunda shola, September 1885, *Gamble* 16882; Doddasampagai, 16.2.1907,

*Fischer* 1434 (CAL); Bimaka shola, 26.8.1970, *Subba Rao* 36372; Katery falls, 3.9.1970, *Sharma* 36016; Kinnakurai, 2.1.1971, *Shetty* 37655; Naduvattam, 26.11.1971, *Ellis* 39013 (MH); Tirunelveli district, Sengalteri, 12.2.1916, *Fischer* 3894 (CAL); Mancholai, 11.5.1958, *Sebastine* 5868 (CAL, MH); Oothu, 4.9.1963, *Henry* 17470; Thulukamparai, 28.11.1969, *Shetty* 32953; Periar odai, Sivagiri hills, 23.4.1989, *Srinivasan* 89546; Chithar to Kallar, way to Pothigaimalai, 16.10.1989, *Gopalan* 90695 (MH); Virudhunagar district, Way to Chinnapachaiyar estate, 22.10.1988, *Srinivasan* 89453 (MH).

*Notes*: This species closely resembles *B. terminalis* Nees and difficult to distinguish in vegetative condition, but differs in its sparsely hairy leaves, loose inflorescence with reflexed bracteoles, faint blue flowers with reddish-purple tube and large capsule. Flowers open before 7 am and remain till the next day.

**Barleria lawii** T. Anderson, J. Linn. Soc., Bot. 9: 492. 1867; Clarke in Hooker, Fl. Brit. India 4: 486. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Cooke, Fl. Bombay 2: 460. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Gamble, Fl. Madras 2: 742. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 59. 1952; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Sharma *et al.*, Fl. Karnataka: 202. 1984; Bole & Almeida, J. Bombay Nat. Hist. Soc. 82: 75. 1985; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 291. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 601. 2001; Almeida, Fl. Maharashtra 4(A): 14. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009. **Fig. 10, 21d**

Type: India, Karnataka, Chikmagalur district, Bababudan hills, *Stocks & Law* 33 (CAL!).

*Barleria beddomei* T. Anderson ex Bedd., Icon. Pl. Ind. Or.: 62, t. 258. 1874.

Type: India, Bombay Presidency, Singhur, *Herb. Beddome* 38509 (MH!).

*Barleria sepalosa* C.B. Clarke in Hooker, Fl. Brit. India 4: 487. 1884; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009, **syn. nov.**

Type: Herb. Hook.f & Thomson, Concan, *Gibson* 35 (Photo!, K).

Vernacular Name: *Ikharu* (Marathi).

Shrubs, perennial, erect, up to 2 m high. Stems terete, strigose and glandular-pubescent when young. Leaves elliptic-lanceolate, 3 – 15 × 1.5 – 5.5 cm, attenuate at base, acuminate at apex, lineolate

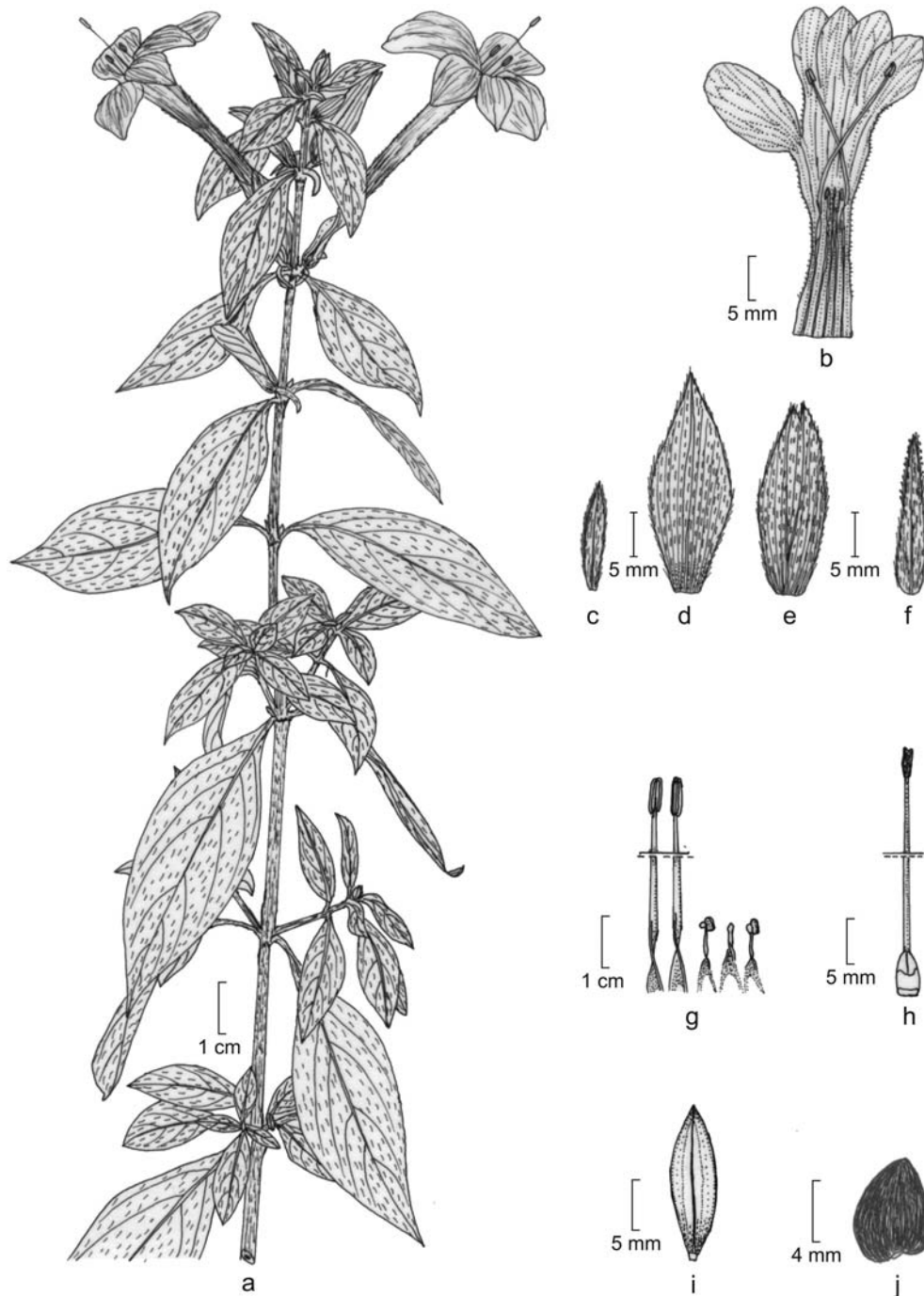


Fig. 10. *Barleria lawii* T. Anderson: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

and strigose above; lateral veins 5–7 pairs, densely strigose beneath; petioles 5–15 mm long, pubescent. Flowers solitary, axillary or in short raceme-like cymes, often forming a terminal panicle; bracts linear, 5–13 × c. 2 mm, strigose intermixed with cupular glandular hairs; midrib prominent. Outer sepals subequal; anticous 1.5–3 × 0.7–1.2 cm; posticus elliptic-lanceolate, 2–2.8 × 0.8–1.5 cm, entire at margin, acuminate at apex, strigose and

glandular-pubescent; posticus acutely 2-toothed at apex, prominently veined; inner sepals linear-lanceolate, 1–1.8 × 2–3 mm, scarious and ciliate at margins, acuminate at apex, strigose and glandular-pubescent outside, palmately veined. Corolla bilipped ( $\frac{4}{1}$ ), 7.5–9 cm long, glandular-pubescent outside, white, blue-tinged at throat, veined; tube 4.5–6 cm long; lobes ovate-oblong, 1.5–3 × 1–2 cm. Fertile stamens 2, exserted; filaments 3.5–5 cm

long; anthers c. 5 mm long; sterile stamens 2, 5 – 8 mm long, connate when young, sometimes rudimentary; staminode c. 2 mm long, trullate at apex. Disc covering about  $\frac{2}{3}$  of ovary. Ovary ovoid, 4 – 5 mm long, glabrous; style terete, 6.5 – 8.5 cm long, glabrous; stigma 2-lobed. Capsules ellipsoid, 1.5 – 2.5 × 0.5 – 0.7 cm, compressed, glabrous. Seeds ovate or suborbicular, 5 – 7 × 5.4 – 6.8 mm, truncate or subcordate at base, compressed, clothed with silky hairs.

*Flowering & Fruiting:* October – March.

*Habitat:* Open hillslopes in sholas and dry and moist deciduous forests.

*Distribution:* India: Gujarat, Karnataka, Kerala, Madhya Pradesh and Maharashtra. Endemic.

*Specimens examined:* INDIA, Malabar, Concan, *s. die*, *Stocks & Law* 38510 (MH). **Maharashtra**, Kolhapur district, Patgaon, *s. die*, *Sardesai* 203 (SUK); Nasik district, Trimbak, 3.2.1983, *Narasimhan* 165323; Saptashringi hill, Kelwan, 27.10.1983, *Narasimhan* 166184 (BSI); Anjaneri hills, 25.10.2005, *Shendage* SMS2505 (SUK); Pune district, Dhuyanbacha jungle, Khed taluk, *s. die*, *Janardhanan* 76416; Malvandar, Bhilvde Khurd, Junner, *s. die*, *Hemadri* 107443; Sinhadga, 14.4.1956, *Jain* 368 (BSI); Khandala, between tunnel 25 & 26 down the ravines, 18.11.1961, *Ansari* 32871 (CAL); Foot of Shinga hill, Khed taluk, 27.11.1961, *Janardhanan* 75892; Western slope of Vahagaon hill, Khed taluk, 10.12.1961, *Janardhanan* 76470; Shivneri hill, 12.10.1962, *Ansari* 83731; Monkey hill, Khandala, 27.11.1962, *Raghavan* 85145; Atkarwadi Swihapad, Haveli taluk, 21.10.1964, *Ansari* 101685 (BSI); Inglun, 13 mile west to Junner, 30.10.1964, *Hemadri & Ansari* 104250; On road side, near Pet-Ambavane, Mulshi, 30.10.1964, *Reddi* 101127 (BSI, CAL); Bhadalwadi, Haveli taluk, 7.1.1965, *Ansari* 104797 (BSI); Dhak forest Junner, 29.9.1965, *Hemadri* 107498 (CAL); Malshej ghat, 16.11.2005, *Shendage* SMS2513 (SUK); Rajur – Wanjulshet, 27.11.2006, *Shendage* SMS2531; Raigad district, Matheran, 1.11.1907, *Paramjpe s.n.*; Satara district, Fitzgerald ghat, below Mahabaleshwar, *s. die*, *Cooke* 122; Mahabaleshwar – Pratapgad, 21.11.1902, *Bhide* 1171; Thane district, Pali to Nagthana, December 1902, *Gammie* (BSI); Dhamni hill, near Mokhada, 19.10.1967, *Billore* 111991; Asheri fort hill, Monar range, 29.10.1967, *Billore* 113311; Sadrya Ghat, Tokavada range, 16.11.1968, *Billore* 115453 (BSI, CAL).

*Notes:* It is found often growing along with *Euphorbia ligularia* in Maharashtra. Plant shows comparatively long internodes. Flowers open between 5 and 7 pm and remain till next one and half day.

**Barleria nitida** Nees in Wallich, Pl. Asiat. Rar. 3: 91. 1832 & in de Candolle, Prodr. 11: 224. 1847; Wight, Icon. Pl. Ind. Orient. 2: 3, t. 454. 1841; Anderson, J. Linn. Soc., Bot. 9: 491. 1867; Clarke in Hooker, Fl. Brit. India 4: 490. 1884; Gamble, Fl. Madras 2: 743. 1924; Matthew, Fl. Tamilnadu Carnatic: 1165, t. 90h. 1983; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 11, 21i**

Lectotype (designated here): Herb. Prop., *Wight s.n.* (MH!).

Vernacular Names: *Adukku mulli* (Tamil).

Herbs or undershrubs, perennial, erect, up to 1 m high, much branched. Stems terete, ribbed, puberulous. Leaves ovate to obovate or elliptic, 3.5 – 7 × 2 – 3.5 cm, attenuate at base, faintly ciliate-toothed at margins, acute at apex, strigose; petioles 1 – 1.5 cm long, pubescent; lateral veins 4 or 5 pairs. Flowers sessile in dense scorpioid cymes, axillary or terminal; bracts ovate, 1 – 2 × 0.5 – 1 cm, spinescent, strigose, 5-nerved. Sepals membranous when dry, strigose; outer sepals ovate, subequal, soft-spinescent at margins, mucronate-soft-spinescent at apex, strigose; anticous 2 – 2.5 × 1 – 1.5 cm; posticus 1.5 – 2 × 1 – 1.5 cm; inner sepals linear-oblong, 6 – 10 × 2 – 3 mm, glandular-pubescent at margins, acute at apex. Corolla 4 – 5 cm long, retrorse-hairy outside, white; lobes oblong or obovate, subequal, 1.5 – 2 × 1 – 1.5 cm, entire at margin, obtuse at apex; tube 2.5 – 3 cm long, glabrous below. Fertile stamens 2, exserted; filaments 1.5 – 2 cm long, glabrous, bluish towards apex; anthers c. 4 mm long, bluish; sterile stamens 2; filaments c. 2 mm long; anthers less than 1 mm long; staminode linear, c. 2 mm long. Disc covering more than  $\frac{2}{3}$  of ovary. Ovary oblong-ovoid, c. 5 × 2 mm, glabrous; style 2.5 – 3.5 cm long, glabrous; stigma less than 1 mm long, 2-lobed. Capsules ellipsoid, 1.5 – 2 × 0.5 – 0.6 cm, glabrous. Seeds ovate or suborbicular, 4.5 – 5.5 × 4.8 – 5.2 mm, appressed-hairy, blackish.

*Flowering & Fruiting:* July – March.

*Habitat:* On rocky hillslopes in dry and moist deciduous forests.

*Distribution:* World: India and Sri Lanka. India: Karnataka and Tamil Nadu.

*Specimens examined:* INDIA, **Karnataka**, Mysore & Carnatic, *s. die*, *Thomson s.n.* (MH). **Tamil Nadu**, Madurai district, Alagar hills, 17.2.1958, *Subramanyam* 5349 (MH); Alagarcoil, 28.2.1978, *Chandrabose* 53405 (CAL, MH); Alagar hills and Silambar valley, 29.1.2007, *Shendage* SMS2535; Karandamalai hills, 30.1.2007, *Shendage* SMS2538 (SUK); Pudukottai district, Ponamaravathi, 12.1. 1985, *Arulappan* 287; Ramanathapuram district,



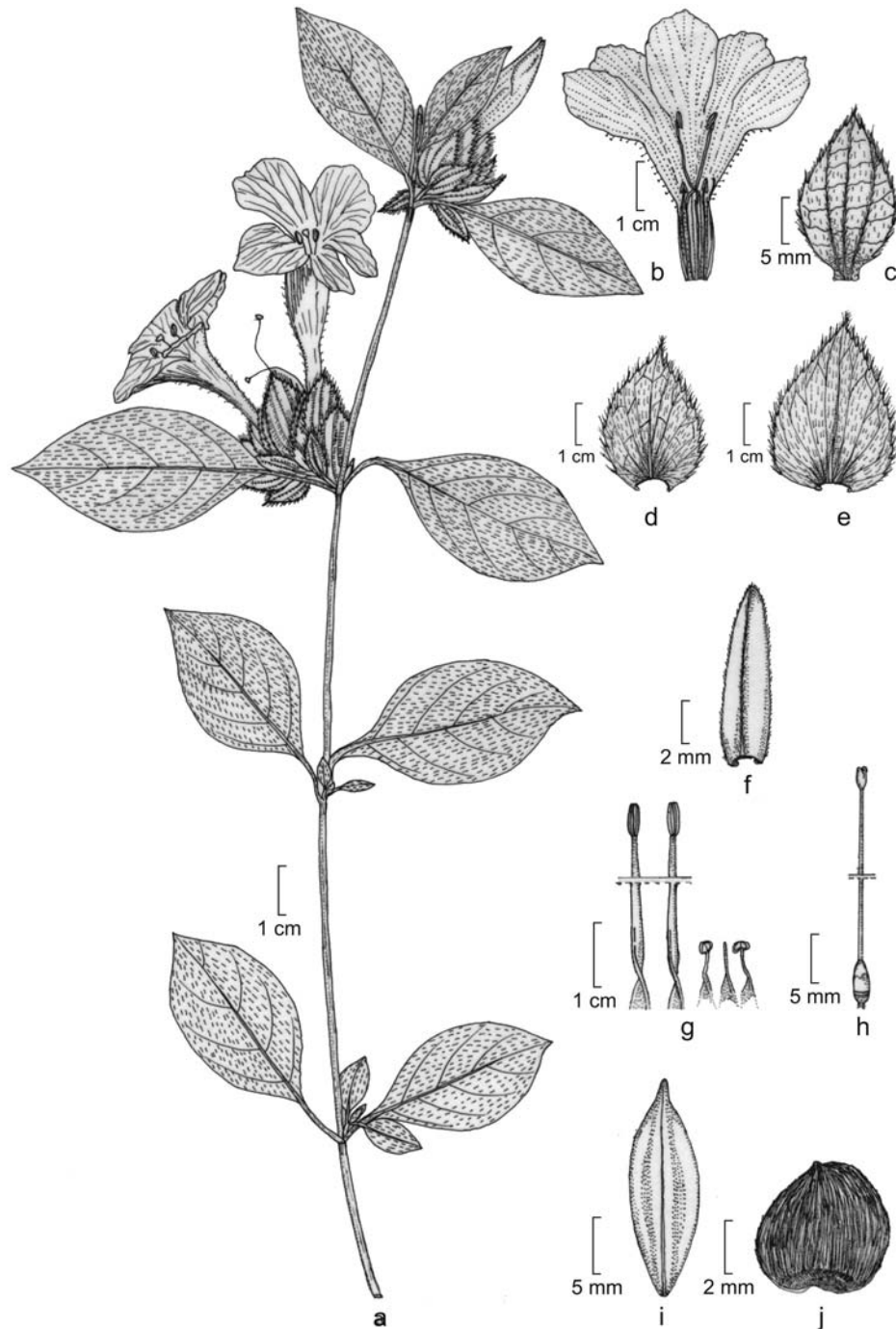


Fig. 11. *Barleria nitida* Nees: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

Piranamalai – Tirupathur, 19.12.1964, *Ramamurthy* 22780 (MH); Aiyankoil forest, 12.3.1970, *Vajravelu* 33658; Marudhadi beat, Pudupatti, 8.12.1971, *Vajravelu* 39325; Salem district, Pachaimalai, on the way to Perumalkoil, 30.3.1979, *Perumal* 22532 (CAL); South Arcot district, Pakkamalai R.F., 21.1.1978, *Ramamurthy* 52892; Tiruchirappalli district, Pachaimalais ghat road, *s. die*, *Matthew*, *Manickam & Manoharan* 19417 (CAL); Way to top

Chengattupatti, 28.10.1958, *Sebastine* 7014 (CAL, MH); Tirunelveli district, Tirunelveli, 1870, *Beddome s.n.*; Mundanthurai, 23.6.1899, *Barber* 586 (MH); Naterikal road and Sengalteri to Kalakad, 12.2.1913, *Hooper & Ramaswami s.n.* (CAL); Courtallum, 14.9.1915, *s. coll., s.n.*; Naterikal road, 21.9.1916, *s. coll., s.n.*; Near Tiger falls, way to Mancholai, 4.3.1958, *Sebastine* 5521 (MH); Near lower dam, Papanasam, 21.2.1960, *Sebastine* 9885 (CAL,

MH); Kalakadu forest, near new bridge, 8.3.1963, *Joseph* 15828; Kodamady – Nadukani road, Thirukurungudi, 27.11.1969, *Shetty* 32921 (MH); Kalakadu forest, near new bridge, 8.2.1983, *Vajrav-elu* 76523 (CAL, MH).

*Notes:* The species closely resembles *B. strigosa* Willd., but differs by herbaceous habit, small leaves, inflorescence at one side of node and white flowers. Flowers open between 7 and 9 am and remain till the next day.

**Barleria strigosa** Willd., Sp. Pl. ed. 4, 3: 379. 1800; Clarke in Hooker, Fl. Brit. India 4: 489. 1884; Prain, Bengal Pl. 2: 606. 1903; Duthie, Fl. Gangetic Plain: 70. 1911; Haines, Bot. Bihar Orissa 4: 684. 1922; Gamble, Fl. Madras 2: 743. 1924; Kanjilal *et al.*, Fl. Assam 3: 446. 1939; Malhotra & Moorthy, Indian Forester 107: 449, t. 1. 1981; Sharma *et al.*, Fl. Karnataka: 203. 1984; Saxena & Brahmam, Fl. Orissa 3: 1334. 1995; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 295, f. 297. 1997; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 700. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 605, f. 2001; Singh *et al.*, Fl. Mizoram: 41. 2002; Almeida, Fl. Maharashtra 4(A): 17, f. 9. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 340. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 15. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 12, 22g**

Type: Wall., Numer. List No. 2509g (CAL!).

*Barleria polytricha* Wall., Pl. Asiat. Rar. 1: 72, t. 82. 1830; Nees in DC., Prodr. 11: 225. 1847; Anderson, J. Linn. Soc., Bot. 9: 491. 1867; Clarke in Hooker, Fl. Brit. India 4: 490. 1884, **syn. nov.**

Type: Wall., Numer. List No. 7143a (CAL!).

*Barleria caerulea* Roxb., Fl. Ind. 3: 39. 1832; Nees in Wallich, Pl. Asiat. Rar. 3: 91. 1832 & in de Candolle, Prodr. 11: 226. 1847; Anderson, J. Linn. Soc., Bot. 9: 491. 1867; Sharma *et al.*, Fl. Karnataka: 202. 1984, **syn. nov.**

*Barleria macrophylla* B. Heyne ex C.B. Clarke in Hooker, Fl. Brit. India 4: 489. 1884.

Type: Herb. Rottler.

*Barleria strigosa* Willd. var. *subglabra* Kuntze, Revis. Gen. Pl. 1(2): 483. 1891, **syn. nov.**

Type: India, Herb. Kuntze s.n. (Photo!, NYBG).

Vernacular Names: *Dosi*, *Neel Jhanti* (Bengali); *Karimkurunni*, *Nilakurnji* (Malayalam); *Itari*, *Koranti*, *Nili* (Marathi); *Banmalli*, *Bansuralli*, *Koelekha* (Odia); *Artagala* (Sanskrit); *Nilambaram* (Tamil); *Neela Gorinta*, *Nilambaramu* (Telugu).

Shrubs, perennial, erect, c. 1 m high. Stems obtusely angular, strigose. Leaves elliptic-ovate, 9 – 16 × 4 – 8 cm, attenuate at base, ciliate at margin, acuminate at apex, strigose above; lateral veins 5 – 8 pairs, densely bulbous-based hairy beneath; petioles 1.5 – 3 cm long. Flowers few, in compact scorpioid cymes, axillary; bracts ovate-lanceolate, 1 – 2.5 × 0.8 – 1.6 cm, ciliate-dentate at margins, strigose. Outer sepals broadly ovate-lanceolate, subequal, 2 – 3.5 × 1 – 2 cm, ciliate-dentate at margins, acute at apex, prominently palmately reticulate-veined; inner sepals linear, 5 – 15 × 1 – 2 mm, ciliate at margins, acute at apex. Corolla bilipped ( $\frac{4}{5}$ ), 4 – 6.5 cm long, glandular-pubescent outside, blue; tube 2 – 3 cm long, white; lobes obovate, 1.5 – 2.5 × 0.8 – 1.6 cm, emarginate at apex. Fertile stamens 2, exserted; filaments 2 – 3 cm long, hairy; anthers 4 – 5 mm long; sterile stamens 2, 3 – 5 mm long; staminode 1, as long as sterile stamens, triangular at apex. Disc covering more than  $\frac{1}{2}$  of ovary. Ovary 3 – 4 mm long; style 3.5 – 4 cm long, hairy at base; stigma linear, c. 2 mm long, bluish. Capsules ellipsoid, 1.5 – 2 × 0.5 – 0.6 cm, compressed, glabrous. Seeds deltoid or ovate, 5.4 – 6.6 × 4.8 – 5.8 mm, subcordate at base, clothed with appressed golden-brown silky-hairs.

*Flowering & Fruiting:* August – March.

*Habitat:* Undergrowth in moist deciduous forests; also grown in gardens, up to 1400 m.

*Distribution:* India: Throughout.

*Specimens examined:* INDIA, **Andhra Pradesh**, Anantapur district, from Chodavarum to Maregdamalla, 15.1.1904, *Nazeeruddin* 27625; East Godavari district, Polavaram, January 1885, *Gamble* 15903; Rampa hills, February 1885, *Gamble* 16007; Devipatnam, 27.11.1902, *Barber* 4916 (MH); Yarlagadda, on way to Sesharagi, 12.2.1947, *Narayanswami & Party* 142 (CAL); Dankaraya to Mangapadu, 30.12.1967, *Subba Rao* 29692; Kurnool district, Mantiala Kanama, February 1887, *Gamble* 18725; Sunnipenta vagu, Srisailam, Nallamalais, 21.10.1964, *Ellis* 22133; Diguvametta, Nallamalais, 17.11.1969, *Ellis* 32447 (MH); Near Mahanandi, 31.12.1979, *Maesen* 3953 (CAL); Beirluty, 7.12.1984, *Sreekumar & Ravishankar* 79508; Krishna district, Sankarimetta, 14.10.1964, *Subba Rao* 21675 (MH); Nizamabad district, Benkhetamala, near Ramgarh, 15.11.1964, *Kanodia* 1246; Prakasam district, Rollapenta R.F., 29.10.1984, *Mohan* 597 (CAL); Visakhapatnam district, Palakonda hills, March 1834, *Gamble* 14036; Barnakonda R.F., 9.12.1923 (MH); Araku valley, 17.9.1961, *Balakrishnan* 655 (CAL); Mettur, 21.2.1967, *Subba Rao* 29559; Simhachalam hill slope, 21.12.1969, *Subba Rao* 32741; Chintapalli,

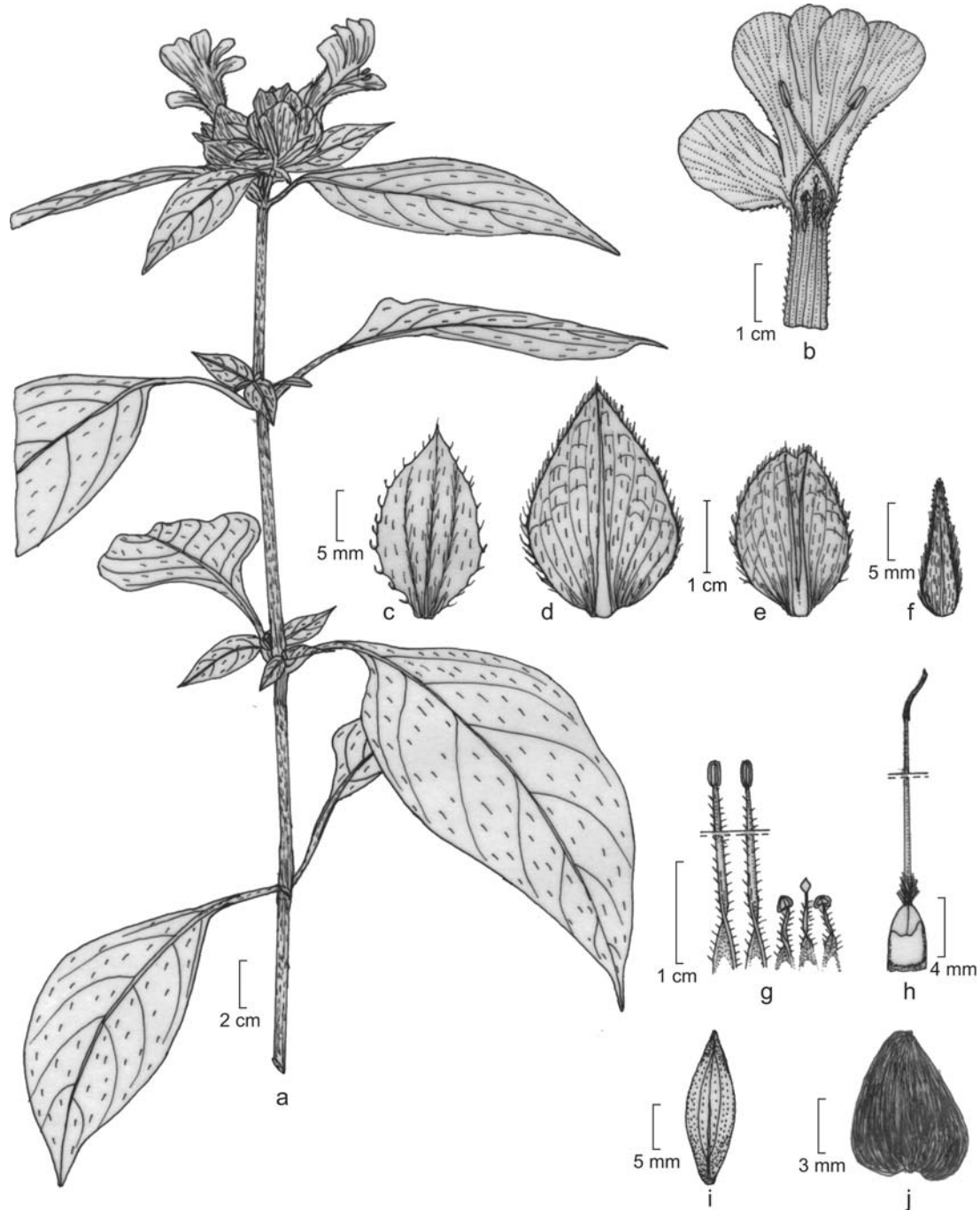


Fig. 12. *Barleria strigosa* Willd. a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

12.11.1970, *Ellis* 37111; Near Busikonda, 23.10.1972, *Subba Rao* 92703 (MH); Madugula to Tachura, near Kanchurai Gumma gedda, 10.4.1976, *Subba Rao* 47283; West Godavari district, Rampa, Devarakonda, 7.10.1920, *Narayanswami* 480; Ethakonda, 10.10.1920, *Narayanswami* 85 (CAL). **Assam**, without precise locality, *s. die*, *Simons s.n.* (CAL). **Bihar**, Champaran district, Kachna pahar, 17.12.1957, *Panigrahi* 11927; Ladaburum, 28.12.1960, *Rao*

22835; Gobardhana forest, Parsa, 15.11.1963, *Shetty* 336 (CAL). **Chhattisgarh**, Bastar district, Keskal, 17.11.1958, *Subramanyam* 7120 (CAL, MH); Way to Thirathgarh falls, 9.2.1961, *Balakrishnan & Henry* 12027 (MH); Kanker district, Dendakaranya, Balimela, 23.5.1959, *Rao* 18529 (CAL). **Goa**, Along the road after entering Goa from Anmod, 5.11.1962, *Rao* 84335; Butpal, Kampal hill top, 10.11.1962, *Rao* 84627; Badsare-Wagal forest, 17.3.1964, *Kanodia*



96338 (CAL). **Jharkhand**, Ranchi district, Chota Nagpur, *s. die*, Wood *s.n.*; Chota Nagpur, December 1880, Gamble *s.n.* (CAL). **Karnataka**, Bengaluru district, Lalbag garden, Bangalore, 28.1.2007, Shendage SMS2532 (SUK); Bellary district, Ramadurg, 15.2.1917, *s. coll.* 14397 (MH); Temple forest area, 13.1.1976, Singh 142407 (BSI); Swamimalai forest, Sandur, 15.11.1979, Ramesh & Ramesh 10463 (CAL). **Madhya Pradesh**, Kalair Chalritra, 27.10.1960, Maheshwari 4230; Bailachila, 12.2.1963, Panigrahi 6822 (CAL). **Maharashtra**, Raigad district, Matheran, May 1906, Meebold 4898 (CAL). **Odisha**, Ganjam district, Kaliagia ghat, January 1884, Gamble 13704; Tickapalli to Linepada, 23.1.1900, Barber 1210; Raikia to Digi, 29.1.1900, Barber *s.n.* (MH); Sambalpur district, Bhatipalthar, *s. die*, Panigrahi 20664; Sambalpur, *s. die*, Griffith *s.n.*; Nursingpur, 17.4.1943, Biswas 6105; Gourtulla, Kalahandi, 5.5.1956, Mukherjee 4272; Bhangubasa, 13.2.1958, Panigrahi 12306; Hatigirdha, 4.11.1986, Panda 283; Pradhanpat, 24.1.1989, Panda 1367 (CAL). **Sikkim**, Near Teesta, 1875 – 76, King *s.n.*; Teesta valley, 12.10.1908, Smith 430 (CAL). **Tamil Nadu**, Chennai district, Museum compound, Madras, 7.2.1986, Narasimhan 972 (MH); Nilgiri district, Way to Thirthagrah falls, 9.6.1961, Balakrishnan & Henry 12027 (CAL). **Tripura**, Sabual-Phuldangsa, 29.1.1962, Deb 27258 (CAL). **West Bengal**, Darjeeling district, Brip, Darjeeling, October 1877, Clarke *s.n.*; Howrah district, Makardah, 2.2.1961, Banerjee 1023; Jalpaiguri district, Banya 2 of Chilapata, 7.12.1995, Chandra & Mondal 1067; Forest titag 3 of Jaldapora, 12.12.1995, Chandra & Mondal 1130; Malda district, Adina forest, 20.11.1965, Dutta 92; Midnapur district, Darkiajharna, 2.5.1976, Maji 6411; Puruliya district, Valley of the water fall, near Maharajpure, Rajmahal, *s. die*, Kurz *s.n.*; Chumukdanga, 6.11.1944, Biswas 6454; Simbalbari Jindharia, 16.11.1948, Biswas 8687; Parasnath hill, Madhubani road, 10.10.1955, Mukherjee 3972; Thalam beli, Kolma, 15.3.1964, Biswas 91; Matha on the hill, 11.9.1964, Malick 36; Golaghat, Mahananda Wildlife Sanctuary, 11.5.1995, Chandra 10884 (CAL). **Others**, Chiuda oritrat, 13.1.1890, Duthie 9650 (CAL).

*Note:* Flowers open between 7 and 9 am and remain for next two days.

**Barleria terminalis** Nees in de Candolle, Prodr. 11: 225. 1847; Dalzell & Gibson, Bombay Fl.: 188. 1861; Malhotra & Moorthy, Indian Forester 107: 449, t. 1. 1981; Sharma *et al.*, Fl. Karnataka: 203. 1984; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 605, f. 2001; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009.

**Fig. 13, 22h**

Type: Herb. Paris, Jacquemont 801 (P).

**Barleria polystachya** Nees in de Candolle, Prodr. 11: 226. 1847, **syn. nov.**

Type: Herb. Hook.

**Barleria strigosa** Willd. var. *polystachya* (Nees) C.B. Clarke in Hooker, Fl. Brit. India 4: 490. 1884; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009, **syn. nov.**

**Barleria strigosa** Willd. var. *terminalis* (Nees) C.B. Clarke in Hooker, Fl. Brit. India 4: 490. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Cooke, Fl. Bombay 2: 462. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Santapau, Bot. Mem. Univ. Bombay 2: 61. 1952; Bole & Almeida, J. Bombay Nat. Hist. Soc. 82: 75. 1985; Rao, Fl. Goa 2: 319. 1986; Naithani *et al.*, Forest Fl. Goa: 472. 1997.

**Barleria caerulea** sensu Graham, Cat. Pl. Bombay: 161. 1839, non Roxb. 1832.

English Name: Blue Barleria.

Shrubs, perennial, erect, up to 2 m high. Stem terete, sparsely strigose with bulbous-based hairs; internodes swollen at base. Leaves elliptic-lanceolate, 13 – 29.5 × 5 – 12 cm, attenuate at base, ciliate at margins, acuminate at apex, sparsely strigose with bulbous-based hairs above, densely so on nerves beneath; petioles 1 – 6 cm long, grooved above, hirsute above, dark brown beneath; lateral veins 7 – 9 pairs. Flowers 6 – 8 cm long, in terminal crowded simple dichasial cymes; bracts elliptic-lanceolate, 2 – 5 × 0.5 – 2 cm, cuneate at base, ciliate at margins, hispid on veins. Outer sepals ovate-lanceolate, subequal, 2 – 3.5 × 1 – 2 cm, ciliate at margins, acute, often faintly 2-toothed at apex, herbaceous, hispid with bulbous-based hairs outside; inner sepals linear, 1 – 2 × 0.3 – 0.4 cm, acute at apex, bulged at middle, densely sericeous-ciliate at margins, scarious, glandular-pubescent outside towards apex; glands cupular. Corolla bilipped ( $\frac{1}{4}$ ), 6 – 6.5 cm long, glandular-puberulous outside, blue; tube 3 – 4 cm long, widening above, paler than limbs; lobes oblong, 1.5 – 2.5 × 1 – 2 cm, obtuse at apex. Fertile stamens 2, exserted; filaments 3 – 4 cm long; anthers *c.* 7 mm long; sterile stamens 2, 5 – 10 mm long, 1-loculed; staminode scaly; filament hirsute at base. Disc covering about  $\frac{1}{2}$  of ovary. Ovary ovoid, *c.* 4 mm long; style terete, 5 – 5.5 cm long; stigma linear, 2 – 3 mm long, purple. Capsules ellipsoid, 1.5 – 2 × 0.6 – 0.7 cm, compressed, glabrous. Seeds ovate, 7 – 8.4 × 5.6 – 6 mm, truncate or obtuse at base, clothed with appressed-silky hairs.

*Flowering & Fruiting:* October – March.

*Habitat:* Along streams in higher altitudes.

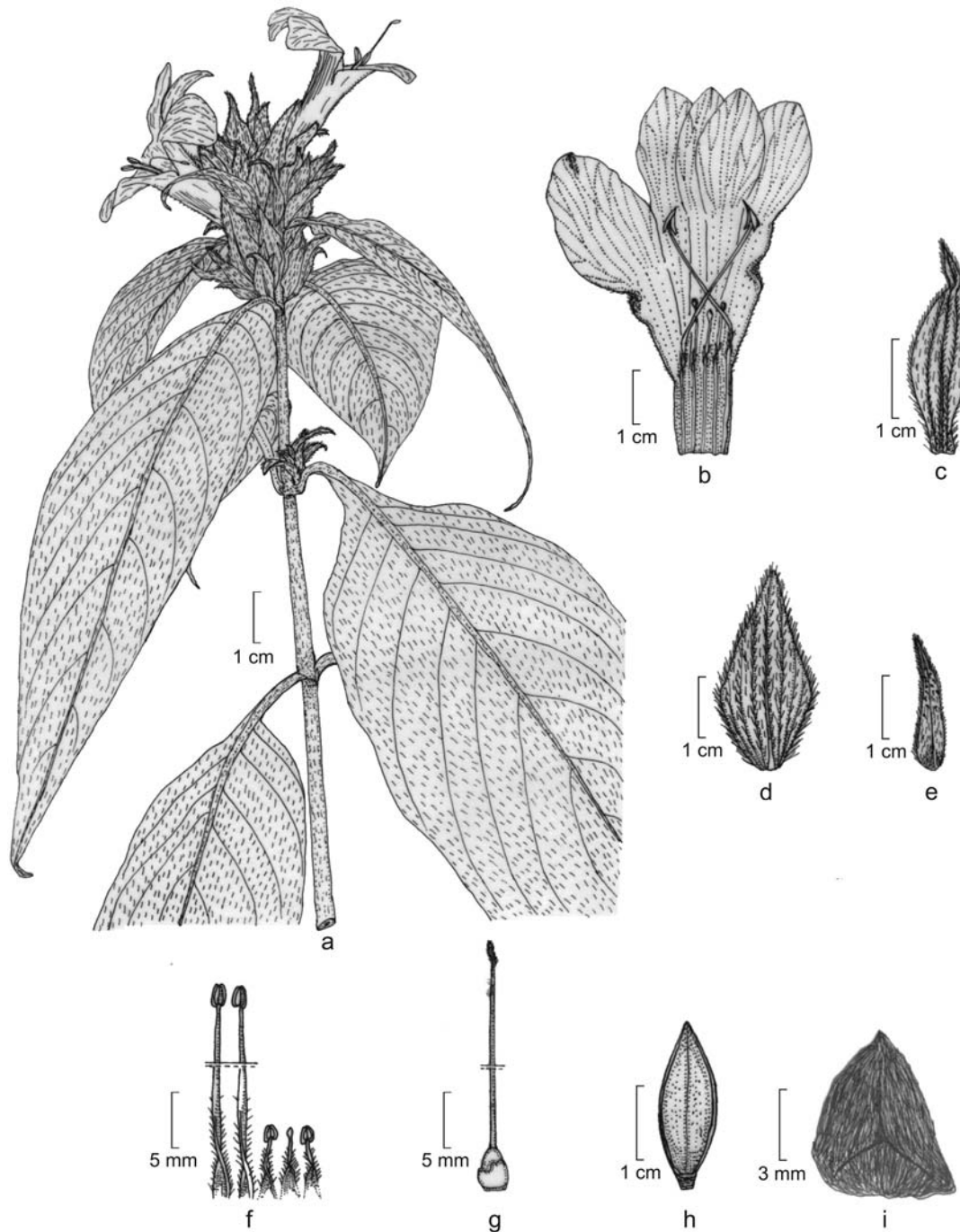


Fig. 13. *Barleria terminalis* Nees: a. Flowering twig; b. Corolla split open; c. Bract; d. Outer sepal; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

**Distribution:** INDIA: Goa, Karnataka, Maharashtra and Odisha. Endemic.

**Specimens examined:** INDIA, Malabar, Concan, *s. die*, Stocks & Law *s.n.* (MH). **Goa**, Badsare – Wagal forest, 17.3.1964, Kanodia 96338; Codal, 6.10.1964, Raghavan 103277 (BSI); Molem, 22.11.1996, Joshi & Raj Kumar 410; Molem – Anmod, 19.10.1997, Janarthanam & al. 1137 (Herbarium, Goa Univer-

sity). **Maharashtra**, Kolhapur district, Shelap, *s. die*, Sardesai 1016; Dajipur, *s. die*, Sardesai 670 (SUK); Pune district, foot of Bhoma hill, Khandala, 23.12.1962, Rao 83409 (BSI); Rawine above Bushi lake, 24.11.1964, Reddi 101148 (CAL); On the way to Atvan from Sakerpatan Plateau-Lonavala, 7.12.1964, Reddi 100927; Satara district, Mahabaleshwar – Pratapgad, 21.11.1902, Bhide *s.n.* (BSI); Mahabaleshwar, Fitzarald ghat, 29.12.1950, Bole 20

(CAL); Kisorde, Koyna, 24.11.1978, *Kochhar* 157843 (BSI); Waghavale-Bamnoli, 6.11.2005, *Shendage* SMS2507 (SUK); Raigad district, Matheran, November 1892, *s. coll., s.n.* (MH); Ratnagiri district, Ramghat, Bhedsi, 27.4.1971, *Kulkarni* 129347 (BSI). **Odisha**, Koraput district, Gunpur, 29.8.1983, *Safai & Rasty* 13609 (CAL).

*Note*: Flowers open between 7.00 and 9.00 am and remain till next two days.

**Barleria vestita** T. Anderson in Thwaites, Enum. Pl. Zeyl. 1: 230. 1860 & J. Linn. Soc., Bot. 9: 492. 1867; Beddome, Icon. Pl. Ind. Or.: 62, t. 263. 1872; Clarke in Hooker, Fl. Brit. India 4: 486. 1884; Sundararaj, J. Bombay Nat. Hist. Soc. 53: 524. 1955; Kumari in Henry *et al.*, Fl. Tamil Nadu 2: 143. 1987; Cramer in Dassanayake, Rev. Handb. Fl. Ceylon 12: 91. 1998; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 8. 2009.

Type: Sri Lanka, Ramboda, *Gardner* in *C.P.* 2004 (Holotype, PDA; Isotypes, K).

Shrubs, perennial, erect, up to 2 m high. Stems terete, swollen at nodes, hirsute. Leaves broadly elliptic-lanceolate, 10 – 30 × 2.5 – 9 cm, attenuate at base, ciliate at margins, acuminate at apex, pubescent; lateral veins 10 – 14 pairs; petioles 1 – 2.5 cm long, hirsute. Flowers in dichasial scorpioid cymes, often forming a large terminal panicles; peduncles 5 – 6 cm long; bracts linear-lanceolate, 5 – 15 × 1 – 3 mm, acuminate at apex, hispid. Outer sepals lanceolate, subequal, 2.5 – 3.5 × 0.5 – 1 cm, acuminate at apex, appressed-hairy; inner sepals linear-lanceolate, 1 – 18 × c. 4 mm, acute at apex, appressed-hairy. Corolla white or pale blue to violet; tube 5 – 6 cm long; lobes obovate, 3.5 – 4.5 × 1.5 – 3 cm, obtuse-emarginate at apex. Fertile stamens 2, exserted; filaments c. 5 cm long; sterile stamens 3. Disc covering 1/3 of ovary. Ovary ovoid, c. 5 mm long, coarsely appressed-hairy; style c. 5 cm long; stigma c. 3 mm long. Capsules oblong-ovoid, 3 – 4 × 0.8 – 1 cm, sparsely puberulous. Seeds ellipsoid, covered with coarse appressed hairs.

*Flowering & Fruiting*: September – February.

*Distribution*: World: India and Sri Lanka. India: Tamil Nadu (Nilgiri).

*Specimens examined*: INDIA, **Tamil Nadu**, Nilgiri district, Neelgheery Hill, 1873, *Beddome s.n.*; Karthaery, August 1883, *Lawson s.n.* (MH).

*Notes*: This species is included here on the authority of Sundararaj (1956). As it could not be collected during the study description was made based on herbarium specimens and literature.

### Subgenus: *Prionitis* (Nees) Lindau

#### Key to the sections

1. Capsules 2-seeded; seeds hairy ..... 2
1. Capsules 4-seeded; seeds glabrous .....  
..... Sect. **Caviostrata**
2. Plants armed; flowers orange or golden yellow  
..... Sect. **Prionitis**
2. Plants unarmed; flowers pink, purple or lilac .....  
..... Sect. **Somalia**

#### Section: *Prionitis*

#### Key to the species

1. Leaves linear-lanceolate; flowers in dense terminal spike; bracts suborbicular, brownish outside ..... **B. lupulina**
1. Leaves ovate-elliptic; flowers solitary, axillary; bracts linear-lanceolate, greenish outside ..... 2
2. Outer sepals with glandular hairs inside; style glabrous..... **B. cuspidata**
2. Outer sepals without glandular hairs inside; style hirsute at base ..... **B. prionitis**

**Barleria cuspidata** B. Heyne ex Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832; Wight, Icon. Pl. Ind. Orient. 2: 3, t. 451. 1841; Nees in de Candolle, Prodr. 11: 239. 1847; Anderson, J. Linn. Soc., Bot. 9: 490. 1867; Clarke in Hooker, Fl. Brit. India 4: 483. 1884; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 336. 1911; Cooke, Fl. Bombay 2: 458. 1904; Gamble, Fl. Madras 2: 741. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 58. 1952; Matthew, Fl. Tamilnadu Carnatic: 1162, t. 90d. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 444. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Shetty & Singh, Fl. Rajasthan 2: 633. 1991; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 698. 1997; Daniel & Umamaheshwari, Fl. Gulf Mannar: 422. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 599. 2001; Almeida, Fl. Maharashtra 4(A): 11. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009. **Fig. 14, 20h**

Type: Wall., Numer. List No. 2499 (Photo!, K).

Vernacular Name: *Kate Koranti* (Marathi).

Shrubs, perennial, up to 1 m high, armed. Stems terete or obscurely 4-angled; nodes bristled; thorns 2 – 4, axillary, up to 2 cm long. Leaves ovate-elliptic, 6 – 14.5 × 2 – 6 cm, attenuate at base, entire at margins, acuminate at apex, glabrescent, pale beneath; midrib grooved above; lateral veins 3 – 6 pairs; petioles 5 – 10 mm long. Floral leaves



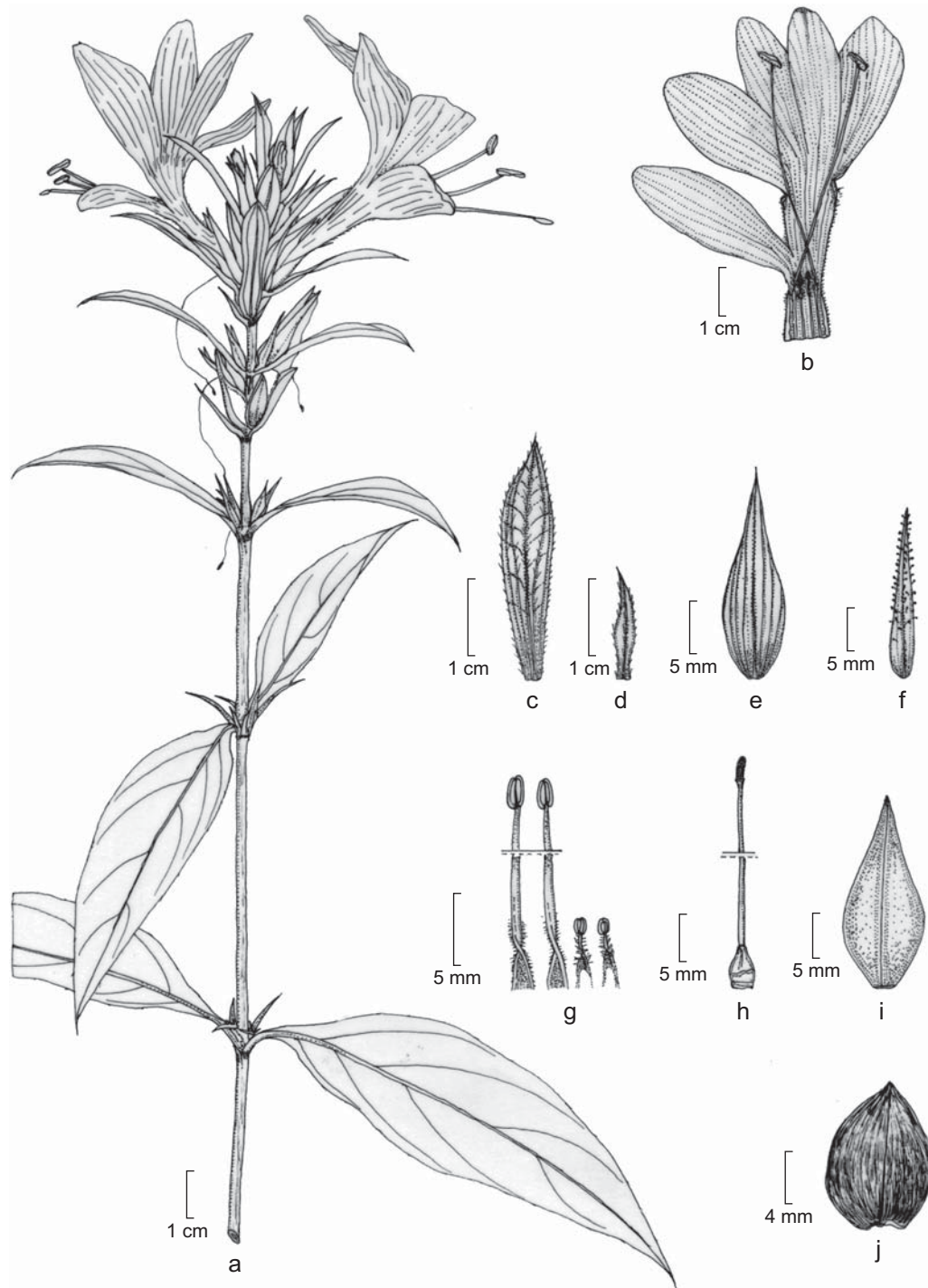


Fig. 14. *Barleria cuspidata* B. Heyne ex Nees: a. Flowering twig; b. Corolla split open; c, d. Bracts; e. Outer sepal; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

narrow and smaller, cuspidate at apex. Flowers solitary or crowded at axils of upper nodes, 6 – 6.5 cm long; bracts linear-lanceolate, 1 – 2.2 × 0.2 – 0.5 cm, cuspidate at apex, appressed white-pubescent. Outer sepals ovate-lanceolate, subequal, 1.5 – 2.5 × 0.5 – 0.8 cm, cuspidate at apex, glandular-pubescent inside, palmately nerved;

inner sepals linear-lanceolate, as long as the outer, 3 – 4 mm across, acute at apex. Corolla bilipped ( $\frac{1}{4}$ ), yellow; tube c. 2 cm long, bent at base, hairy outside; lobes oblong or oblong-obovate, 2 – 3 × 1 – 1.5 cm, obtuse at apex. Fertile stamens 2, exserted; filaments 4.8 – 5.5 cm long, flat, hairy at base; anthers c. 4 mm long; sterile stamens 2, 1 – 2

mm long; filaments hairy; anthers c. 1 mm long, hairy; staminode absent. Disc covering  $\frac{1}{4}$  of ovary. Ovary ovoid, 3 – 4 mm long, glabrous; style slender, 5.5 – 6.5 cm long; stigma ovate, c. 1 mm long, papillate. Capsules ovoid, 1.5 – 2 × 0.6 – 0.8 cm, 2-seeded. Seeds ovoid, 8.5 – 10.8 × 6.5 – 8 mm, subcordate at base, compressed on one side, with silky appressed hairs, copper-brown.

*Flowering & Fruiting:* August – March.

*Habitat:* Dry plains and rocky hillslopes.

*Distribution:* India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Rajasthan and Tamil Nadu. Endemic.

*Specimens examined:* INDIA, **Andhra Pradesh**, Anantapur district, Amugondapalem R.F., 1.11.1982, *Yesoda* 1020 (MH). **Karnataka**, Bijapur district, Among bushes in scrub, Parradakal, 15.9.1979, *Ramesh & Ramesh* 9310 (CAL); Karwar district, Dumbal, 1.8.1888, *Talbot* 1671 (BSI, CAL); Mysore district, Gundlupet, 27.8.1964, *Naithani* 21250 (MH). **Kerala**, Shenkottah to Aryankavu, 8.9.1913, *Calder & Ramaswami* 722 (CAL). **Maharashtra**, Kolhapur district, Phonda ghat, 10.12.2005, *Shendage* SMS2520; Pune district, Varand ghat, 15.11.2005, *Shendage* SMS2510; Malshej ghat, 16.11.2005, *Shendage* SMS2512 (SUK). **Rajasthan**, Jaipur district, Jalmahal – Jaipur, 27.12.1963, *Sharma* 366 (CAL). **Tamil Nadu**, Coimbatore district, Chennimalai, 21.11.1909, *Fischer* 1525 (CAL); Varapalayam, foot of Lamptons peak, 27.4.1956, *Subramanyam* 29 (CAL, MH); Nellimalai, Perur, Noyal river bank, 6.6.1956, *Subramanyam* 58 (CAL); Melmuduthurai, 25.9.1962, *Vajravelu & Pritamlal* 14767; Kanniyakumari district, Nagercoil, 20.10.1893, *Lawson* 309; way to Aramboly from Keeriparai, 24.1.1974, *Henry* 53263; Near Anjugramam, 27.3.1979, *Henry* 61555; Madurai district, way to Suruli forest, 24.9.1959, *Subramanyam* 8195 (CAL); Megamalai – Bodi Range, 12.6.1961, *Sebastine* 12502; Ramanathapuram district, Gopalpuram, Pudupatti, 15.2.1979, *Nair & Srinivasan* 57491 (CAL, MH); Tirunelveli district, Tirukurungudi, 11.2.1913, *Hooper & Ramaswami s.n.*; Manimuthar dam site, 26.6.1957, *Sebastine* 3546; on the way to Courtallum, 28.7.1957, *Subramanyam* 3888 (CAL); Pillaivelai, 27.11.1961, *Sebastine* 13654; Sivanaperi, 8.11.1962, *Joseph* 15213 (CAL, MH).

*Note:* Flowers open between 10 am and 12.00 noon and remain till next day.

**Barleria lupulina** Lindl., *Edward's Bot. Reg.* 18: t. 1483. 1833; Clarke in Hooker, *Fl. Brit. India* 4: 482. 1884; Woodrow, *J. Bombay Nat. Hist. Soc.* 12: 356. 1899; Cooke, *Fl. Bombay* 2: 464. 1904; Haines, *Bot. Bihar Orissa* 4: 684. 1922; Khanna *et al.* in

*Mudgal et al.*, *Fl. Madhya Pradesh* 2: 292, f. 293. 1997; Almeida, *Fl. Maharashtra* 4(A): 14. 2003; Vijaya Sankar & Ravikumar, *Zoo's Print* 19: 1484. 2004; Karthikeyan *et al.*, *Fl. Pl. India – Dicotyl.* 1: 6. 2009.

**Fig. 21f**

Type: Mauritius.

Vernacular Names: *Mullu Kanagaambaram*, *Semmilli* (Tamil).

English Name: Hop-headed Barleria.

Shrubs, perennial, erect, up to 2 m high, armed. Stems terete, glabrous, dark brown; thorns simple, 2 – 4 in each axil, c. 2 cm long, reflexed, white. Leaves linear-lanceolate, 5 – 12 × 0.5 – 2 cm, attenuate at base, ciliate and reddish at margins, cuspidate at apex, glabrous; midrib grooved above, red; lateral veins 8 – 12 pairs; petioles 5 – 15 mm long. Flowers in dense, 5 – 30 cm long terminal spikes, puberulous; bracts suborbicular, c. 1.5 × 1 cm, ciliate at margins, mucronate at apex, with many small cupular brown glands outside in lower half, puberulous; upper half brownish. Outer sepals broadly ovate or lanceolate, subequal, 1 – 1.5 × 0.3 – 0.4 cm, acute at apex, hairy; inner sepals linear-lanceolate, c. 10 × 2 mm, acuminate-mucronate at apex, hairy. Corolla bilipped ( $\frac{1}{4}$ ), c. 2.5 cm long, slightly bent at base, pubescent, yellow; tube c. 2 cm long, hairy outside; lobes broadly obovate, subequal, undulate at margins, glabrous. Fertile stamens 2, exerted; sterile stamens 2; staminode 1, scaly. Disc covering the ovary at base. Ovary ovoid, glabrous; style c. 2.5 cm long, hairy at base. Capsules ovoid, 1 – 1.5 × 0.4 – 0.6 cm, glabrous, 2-seeded. Seeds ovate, c. 7.5 × 5.5 mm, covered with copper-brown appressed hairs.

*Flowering & Fruiting:* March – April.

*Distribution:* Native of Mauritius. India: Bihar, Himachal Pradesh, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal. Cultivated in gardens also found as an escape.

*Specimens examined:* INDIA, **Himachal Pradesh**, Mussoorie, 1894, *Rolson* 112 (CAL). **Madhya Pradesh**, Jabalpur, March 1902, *Eoogre* 178 (CAL). **Maharashtra**, Pune district, College Garden, Poona, 14.3.1904, *Gammie s.n.* (BSI). **West Bengal**, Cultivated in Horto Botanico Calcuttensis, Herb. Sulp., *Kurz s.n.* (CAL).

**Barleria prionitis** L., *Sp. Pl.*: 636. 1753; Burman, *Fl. Indica*: 135. 1768; Roxb., *Hort. Bengal.*: 45. 1814; Nees in Wallich, *Pl. Asiat. Rar.* 3: 93. 1832 & in de Candolle, *Prodr.* 11: 237. 1847; Roxburgh, *Fl. Ind.* 3: 36. 1832 (as *prionites*); Graham, *Cat. Pl.*

Bombay: 160. 1839; Wight, Icon. Pl. Ind. Orient. 2: 3, t. 452. 1841; Voigt, Hort. Suburb. Calcutt.: 486. 1845; Dalzell & Gibson, Bombay Fl.: 189. 1861; Anderson, J. Proc. Linn. Soc. 7: 28, 115. 1864 & J. Linn. Soc., Bot. 9: 490. 1867; Thwaites, Enum. Pl. Zeyl.: 230. 1864; Clarke in Hooker, Fl. Brit. India 4: 482. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 358. 1899; Burkill *et al.* in Dyer, Fl. Trop. Africa 5: 144. 1900; Urban, Symb. Ant. 2: 202. 1900 – 01; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 335. 1911; Prain, Bengal Pl. 2: 605. 1903; Cooke, Fl. Bombay 2: 457. 1904; Duthie, Fl. Gangetic Plain: 69. 1911; Parker, Forest Fl. Punjab: 882. 1918; Haines, Bot. Bihar Orissa 4: 684. 1922; Ridley, Fl. Malay Penins. 2: 587. 1923; Gamble, Fl. Madras 2: 741. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 57. 1952; Maheshwari, Fl. Delhi: 274. 1963 & Ill. Fl. Delhi: f. 170. 1966; Nasir & Ali, Fl. W. Pakistan: 674. 1972; Malhotra & Moorthy, Bull. Bot. Surv. India 13: 309. 1974; Babu, Herb. Fl. Dehradun: 379. 1977; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Matthew, Fl. Tamilnadu Carnatic: 1166, t. 90j. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 448. 1988; Wood *et al.*, Kew Bull. 38: 436. 1983; Chowdhery *et al.*, Fl. Himachal Pradesh 2: 548. 1984; Sharma *et al.*, Fl. Karnataka: 203. 1984; Rao, Fl. Goa: 319. 1986; Kumari in Henry *et al.*, Fl. Tamil Nadu 2: 143. 1987; Kamble & Pradhan, Fl. Akola: 166. 1988; Kulkarni, Fl. Sindhudurg: 321. 1988; Almeida, Fl. Savantwadi: 317. 1990; Vajravelu, Fl. Palghat: 346. 1990; Lakshminarasimhan & Sharma, Fl. Nasik: 358. 1991; Deshpande *et al.*, Fl. Mahabaleshwar: 437. 1995; Pullaiah & Rao, Fl. Nizamabad: 263. 1995; Saxena, Brahmam, Fl. Orissa: 1333. 1995; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 295, f. 49. 1997; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 699. 1997; Naithani *et al.*, Forest Fl. Goa: 473. 1997 (as *prionites*); Cramer in Dassanayake, Rev. Handb. Fl. Ceylon 12: 87. 1998; Naik, Fl. Marathwada: 663. 1998; Diwakar & Sharma, Fl. Buldhana: 241. 2000; Kumar, Fl. Haryana: 285. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 602. 2001; Singh *et al.*, Fl. Bihar: 379. 2001; Sharma & Sarkar in Singh & Rao, Fl. Palamau: 467. 2002; Almeida, Fl. Maharashtra 4(A): 16. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 340. 2004; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 15. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009.

Type: India, Herb. *Linnaeus* 262.13 (Photo!, S).

*Barleria hystrix* L., Mant. Pl. 1: 89. 1767; Nees in Wallich, Pl. Asiat. Rar. 3: 93. 1832 & in de Candolle, Prodr. 11: 237. 1847.

*Barleria prionitis* L. var. *hystrix* (L.) Kuntze, Revis. Gen. Pl. 2: 483. 1891.

### Key to the subspecies

1. Thorns 2 – 4 per node; flowers 3 – 4.5 cm long; anthers 2 – 3.5 mm long ..... subsp. **prionitis**
1. Thorns 8 or more per node; flowers 5 – 7 cm long; anthers 5 – 6 mm long ..... subsp. **pubiflora**

**Barleria prionitis** L. subsp. **prionitis**: Wood *et al.*, Kew Bull. 38: 436. 1983; Raju & Pullaiah, Fl. Kurnool: 350. 1995; Matthew, Fl. Palni Hills: 933. 1999; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 603. 2001; Manjunath *et al.*, Fl. Davanagere: 302. 2004; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009.

*Barleria prionitis* L. subsp. *prionitis* var. *prionitis*: Bhandari, Fl. Ind. Desert: 299. 1978; Shetty & Singh, Fl. Rajasthan: 635. 1991; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 15, 22d**

Vernacular Names: *Kantajinti*, *Peetjhanti* (Bengali); *Kantashila* (Gujarati); *Kala Bans*, *Katsareya*, *Piabansa* (Hindi); *Karunta*, *Mullugorante* (Kannada); *Koramti* (Konkani); *Chemmulli*, *Varelmutti* (Malayalam); *Kalsunda*, *Kate Koranti*, *Kholeta*, *Koranta*, *Pivala-Koranta* (Marathi); *Daskeranta* (Odia); *Vajradanti* (Sanskrit); *Kaattu Kanagaambaram*, *Semmulli* (Tamil); *Mullugorinta Chettu* (Telugu).

English Name: Porcupine Flower.

Shrubs, perennial, erect, up to 1.5 m high, much branched, armed. Stems terete, glabrous; thorns simple, 2 – 4, axillary, 5 – 15 mm long, whitish. Leaves ovate or elliptic, 6 – 15 × 4 – 6 cm, attenuate at base, ciliate at margins, cuspidate at apex, pubescent above when young, glabrous when mature; petioles 0.5 – 3 cm long, grooved above; lateral veins 4 – 6 pairs. Flowers sessile, often solitary in lower axils, becoming spicate above, 3 – 4.5 cm long; bracts linear-lanceolate, 1 – 1.5 cm long, cuspidate at apex. Outer sepals ovate-lanceolate, subequal, 1 – 1.5 × 0.4 – 0.5 cm, acuminate at apex, appressed-hairy inside; inner sepals linear-lanceolate, 1 – 1.5 × c. 0.2 cm, acuminate at apex. Corolla bilipped ( $\frac{1}{4}$ ), pubescent outside, orange-yellow; tube c. 1.5 cm long, swollen and curved at base, pubescent above; upper lobes oblong, 1.2 – 2 × 0.6 – 1.2 cm, acute at apex. Fertile stamens 2, exserted; filaments 2 – 2.5 cm long, glandular-pubescent, yellowish; anthers c. 3 mm long, yellow; sterile stamens 2, 1 – 2 mm long; anthers c. 1 mm long; staminode absent. Disc covering less than  $\frac{1}{4}$  of ovary.



Ovary ovoid, *c.*  $3 \times 2$  mm; style terete, 2.5 – 3 cm long, hisute at base; stigma linear, *c.* 1 mm long, sticky, pinkish. Capsules ovoid, 1.5 – 2  $\times$  0.6 – 0.8 cm, compressed, 2-seeded. Seeds ovoid, 7.4 – 8.5  $\times$  6 – 6.8 mm, subcordate at base, flattened on one side, covered with copper-brown appressed hairs.

*Flowering & Fruiting:* August – March.

*Habitat:* Ravines and shady habitats in deciduous forests and also grown in gardens.

*Distribution:* World: India, Malesia, Pakistan, Philippines, Sri Lanka, Tropical Africa and Yemen. India: Throughout.

*Specimens examined:* INDIA, **Andaman & Nicobar Islands**, North Nicobar, Mildara, Katchal, 11.8.1974, *Chakraborty* 2048; Diglipur-4, 5.12.1974, *Balakrishnan & Nair* 4963 (CAL). **Andhra Pradesh**, Chittoor district, towards Kailasakona, 9.10.1974, *Subba Rao* 46040 (MH); Talakona, 7.11.1987, *Ranga Charyulu* 1753; Cuddapah district, Balapalli, 7.11.1962, *Ellis* 14926 (CAL, MH); Godavari district, Kondapudi, Godavari Agency, 8.12.1902, *Barber* 5218; Kota, 8.10.1920, *Narayanswami* 528; Krishna district, Delgattu, 10.12.1984, *Venkanna* 5482; Kurnool district, Digurametta, Nallamalais, 11.6.1969, *Ellis* 32412 (MH); Nalkonda district, Nagarjunsagar,

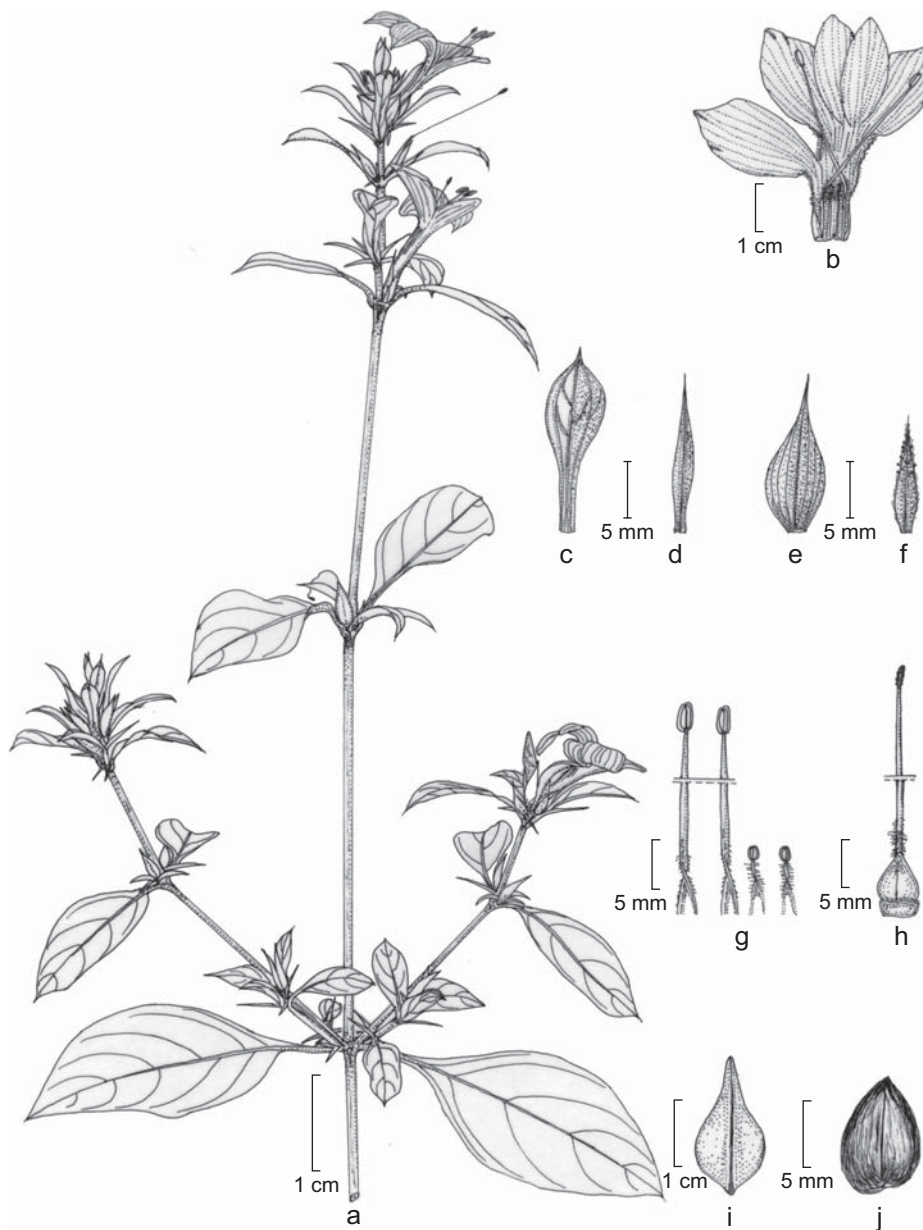


Fig. 15. *Barleria prionitis* L. subsp. *prionitis*: a. Flowering twig; b. Corolla split open; c, d. Bracts; e. Outer sepal; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

13.12.1959, *Sebastine* 9750 (CAL, MH); Nellore district, Mullemkonda hill, 26.7.1914, *Ramaswami* 1279; Way to Amudalakona, 27.12.1975, *Subba Rao* 46777; Visakhapatnam district, Anantagiri, 24.9.1961, *Balakrishnan* 787 (CAL), Circuit house, 4.10.1964, *Subba Rao* 21458; Simhachalam hill slope, 21.12.1969, *Subba Rao* 32743 (MH); Warangal district, Pakhal R.F., *s. die*, *Sebastine* 11624 (CAL, MH); Ogeru road, Kandukur, 18.10.1983, *Mohan* 245 (CAL). **Assam**, Teetsapin, *s. die*, *Jenkins* 339742; Nowgong, *s. coll.*, *s.n.* (CAL). **Bihar**, Bhagalpur district, T.M. Bhagalpur University campus, 8.2.2007, *Shendage* SMS2541 (SUK). **Chhattisgarh**, Bastar district, in Donga ghat, Jagdalpur, 23.11.1958, *Subramanyam* 7286 (MH); Bilaspur district, Korika Khondra, 21.2.1972, *Panigrahi* 16792 (CAL). **Delhi**, without precise locality, 6.12.1965, *Banerjee* 250 (CAL). **Diu & Daman**, Diu Island, 22.11.1962, *Rao* 1971 (CAL); Daman, Daman grande, 2.5.1963, *Rolla* 88907 (BSI); Jalandhar, 18.9.1964, *Hemadri* 102484 (CAL); Jalandhar, 18.9.1984, *Rao* 102484 (BSI); **Goa**, Bansare village, 2 miles from Todal, 21.3.1963, *Kanodia* 88194; Bhatwadi, near Nandore, 4.5.1963, *Kanodia* 88421 (BSI, CAL); Bansare village, 2 miles from Todal, 17.3.1964, *Kanodia* 96342 (BSI); Carambolim, 2.12.1996, *Joshi & Raj Kumar* 440 (Herbarium, Goa University). **Gujarat**, Kachchh district, Lohagarh, 5.5.1956, *Jain* 865; Sudasna hill, 29.1.1957, *Jain* 11405; Nakhatrana, 31.1.1957, *Jain* 11520; Dhinodhar, 2.2.1957, *Jain* 11715; Kawi, 5.9.1957, *Jain* 17787; Cambay, 22.10.1957, *Toor* 28522; Asambia nana, 17.2.1958, *Puri* 31628; Rudramata, 19.10.1958, *Jain* 46849; Girnar forest, 22.12.1959, *Ansari* 54790; Sarangir, 24.12.1959, *Ansari* 61032; Dhinodhar, 12.4.1960, *Jain* 61984; Motisar (Bhuj) Dhara dam, 22.9.1968, *Raghavan* 115083 (BSI); Near Chhodia Chhella river, 3.12.1979, *Maesen* JM3917 (CAL). **Jharkhand**, Ranchi district, Chota Nagpur, December 1891, *Prain s.n.* (CAL). **Karnataka**, Bidar district, Deogiri R.F., Humanabad, 23.1.1976, *Singh* 142789; Bijapur district, Anatpur forest, S.N. 43 – 44, Badami, 26.7.1957, *Jain* 20833; Anatpur forest, S.N. 43 – 44, Badami, 5.9.1974, *Singh* 138778; Karwar district, Yellapure, July 1882, *Talbot* 7270; Dr. Patawardhans garden, 27.3.1956, *Jain* 1445 (BSI); Karwar, *s. die*, *Talbot* 686 (CAL); Mysore district, Koppa road, Agumbe, 30.10.1960, *Raghavan* 67972; Nalur road, Agumbe, 7.2.1961, *Raghavan* 69434; Namadachilume forest, RH vicinity, 30.8.1961, *Rolla* 73432 (BSI); Gundlupet, 27.8.1964, *Naithani* 21260 (MH); Raichur district, Gopally R.F., Lingsagar, 14.2.1975, *Singh* 129588; Kumankheda block, Kushtagi, 9.11.1975, *Singh* 141544; Lingsagar – Raichur Road, 28 km, 13.11.1975, *Singh* 141685 (BSI); South Canara district, way to Mulki, Hejmady, 9.12.1978, *Saldanha & Sreenath* 4921 (CAL). **Kerala**, Kannur district, Kannothe R.F., 3.11.1978, *Ramachandran* 57697 (MH); Kannothe R.F., 28.8.1979, *Ramachandran* 64047 (CAL); Panathur, 28.12.1980, *Ansari* 70050; Kollam district, Parackode, 11.8.1978, *Mohanan* 58466; Palakkad district, Anakatty to Kathalakandi, 24.2.1979, *Vajravelu* 60659 (CAL, MH). **Laccadive & Maldiv Islands**, Laccadives, Minikoy Island, 6.12.1891, *H.M.I.M. s.n.*; Maldiv, Mataro in Miladumadam, 1899, *Gardner s.n.* (CAL); Minikoy Island, 26.11.1960, *Wadhwa* 69850 (BSI). **Madhya Pradesh**, Indore district, Depalpwe, vicinity of IB, 21.12.1961, *Rao* 79274; One mile from Mhow, on way to Simrol, 20.10.1962, *Rao* 83945 (BSI); Sidhi district, Mayhauli, 18.1.1964, *Panigrahi* 2191 (CAL); Saugar district, Rangir, near the river, 6.3.1960, *Subramanyam* 10198 (CAL, MH); Tigorda, Hirapur Reserve Forest, 1.11.1960, *Balakrishnan* 11438; Tikamgarh district, Orcha kila, 15.9.1980, *Verma* 30752; Baldeogarh, 18.4.1989, *Roy & Kishor* 44712 (CAL). **Maharashtra**, Akola district, Narnala forest, Akot, 23.11.1979, *Kamble* 160756 (BSI); Aurangabad district, Osmanpura railway station, 25.10.1970, *Pardeshi* 1675 (BAMU); Buldhana district, Shegaon, 22.3.1982, *Diwakar* 162907; Buldhana-Raipur Rd. 18.6.1982, *Diwakar* 162798; Lonar lake, 26.9.1982, *Diwakar* 164140; Ganesh talab area, Buldhana, 3.10.1982, *Diwakar* 164453; Jamod, 6.10.1982, *Diwakar* 164606; Sangrampur, 16.12.1982, *Diwakar* 163085; Lonar lake, 23.12.1982, *Diwakar* 164819; Lonar lake, 10.3.1983, *Diwakar* 165009; Bawanbid, 14.11.1983, *Diwakar* 171073; Chandrapur district, Jamni, 28.2.1971, *Wadhwa* 133588; Khedsinghi-Khurd Nala, Plot No. 28, 16.10.1972, *Wadhwa* 133723; Moharli, 22.10.1972, *Wadhwa* 130327 (BSI); Gondia district, Amgaon, 22.10.2005, *Shendage* SMS2504 (SUK); Jalgaon district, Gangapuri, 14.3.1957, *Mahajan* 13159; Yawal, 15.3.1957, *Mahajan* 13191; Haripur, 16.3.1957, *Mahajan* 13398 (BSI); Kolhapur district, Kolhapur, *s. die*, *Sardesai* 1756 (SUK); Nagpur district, Starky point, 17.11.1957, *Subramanyam* 4653 (CAL, MH); College of Science premises, 8.12.1962, *Nafday* 551869 (BSI, CAL); Nandad district, Mahur, 6.11.1979, *Zate* 1035 (BAMU); Nandurbar district, Nandurbar, 6.1.1957, *Jain* 11130; Nasik district, Deccan plains, Nashik, 20.2.1906, *Talbot* 4768; Sidewadi kuran, Malegaon, 6.12.1983, *Narasimhan* 166220 (BSI); Osmanabad district, Nilanga, 3.11.1964, *Naik* 917, (BAMU); Pune district, Khandala, near Shingarba temple, 21.3.1956, *Jain* 18; Hivre garden, 24.6.1956, *Puri* 2599; Mulshi, 21.11.1956, *Jain* 9518; Reoeising station, Khandala, 16.3.1963, *Raghavan* 87121; Ambavane ka Anuvar forest, on way to Raigad, 4.2.1964, *Reddi* 95966; Hivre garden, 26.10.1964, *Hemadri* 99772; Kate-Pani forest, Ambavane, 26.10.1964, *Reddi* 101002; Arvi, Hawali taluk, 18.11.1964, *Ansari* 101845; Donaje, Hawali

taluk, 4.12.1964, *Ansari* 104725; Ratnagiri district, Phonda ghat, 24.10.1969, *Kulkarni* 118918; Phonda ghat, 4.10.1970 *Kulkarni* 121424; Satara district, Kumbharli ghat, Koyna, 30.11.1978, *Kochhar* 157994; Kumbharli ghat, Koyna, 31.12.1978 *Kochhar* 158204; Thane district, Kelve, Palghar range, 13.1.1968, *Billore* 113521 (BSI, CAL); Bassien fort, Gokhivve range, 21.1.1968, *Billore* 113707 (BSI); Yavatmal district, Army milk colony, 15.10.1950, *Bole* 554493 (CAL); Near Hiwri temple, 11.12.1976, *Karthikeyan* 148388; Karanji forest, 22.2.1977, *Karthikeyan* 149174; Near Khandula rest house, 2.10.1978, *Karthikeyan* 156743 (BSI). **Odisha**, Sambalpur district, Kapildhar, 7.4.1988, *Panda* 1104; Huma, 26.9.1988, *Panda* 1279; Sundargarh district, Narsinghath temple, 11.11.1959, *Panigrahi* 21010; Jarda, 13.3.1988, *Mukherjee & Namhata* (CAL). **Pudhucherry**, Thavalakuppam, 6.2.1988, *Rajan* 86349 (MH). **Rajasthan**, Alwar district, Bharathri forest block, 23.10.1983, *Parmar* 9445 (CAL); Banswara district, Bai Talak hills, 7.3.1957, *Kanodia* 51087; Bhandaria, 17.11.1957, *Varma* 29329; 1957 plantation of Dadnka, near Jolana, 8.10.1964, *Kanodia* 75608 (BSI); Barmer district, Kala Khet, 4 miles from South Bundi, 15.12.1963, *Varma* 1753 (CAL); Churu district, Narnol, Baradari palace hill, 22.1.1959, *Ansari* 47230; Chudilli hill, 22.1.1959, *Ansari* 47287 (BSI); Jhalawar district, Balghar block, 18.1.1964, *Wadhwa* 5482; Jodhpur district, Mandore garden, Naga Dhari, 6.1.1975, *Roy* 1530 (CAL); Sirohi district, Mt. Abu, 17.10.1958, *Jain* 46752; Mt. Abu – Abu Road, after 9 mile, 27.9.1960, *Rao* 66501; Mt. Abu – Abu Rd., after 9 mile, 30.9.1960, *Rao* 66686; Udaipur district, Devi Pottavi, s. die, *Puri* 37743; Mishradara, Sawaimadhaopur, 12.7.1957, *Jain* 18848; Kota daran, 25.10.1957, *Jain* 28728; Ther mogra plantation, 20.11.1957, *Varma* 28388; Baghdara, 20.11.1957, *Vasavada* 29436; Chittor garh, 22.11.1957, *Varma* 29490; Pushkar Road, Kansar sand dunes, 10.7.1958, *Puri* 35875; Jolana-field, near nala, 15.1.1959, *Jain* 51189; Dindara-Arnai, 17.2.1959, *Jain* 47981; Jaipur-Ramgarh, 19.3.1959, *Jain* 49633; Sirohi-Malaghur near Pasthanji, 12.11.1959, *Jain* 60486; Kevda jungle, 24.9.1962, *Gramwat* 214; Parohadi auwalia forest hill, 28.9.1962, *Kanodia* 82204 (BSI); Khandamal near Khanbaghat, 8.10.1962, *Kanodia* 82405 (CAL); Garamghat forest, 12.10.1962, *Kanodia* 82536 (BSI); Chittor garh, 13.12.1963, *Varma* 1693; Bansi, 15.12.1963, *Varma* 1753 (CAL). **Tamil Nadu**, Coimbatore district, Maruthamalai, 28.9.1956, *Sebastine* 897; Vellingiri hills, 11.2.1957, *Sebastine* 2255 (MH); Anamalais, 12.9.1961, *Joseph* 13306 (CAL, MH); Way to Sundakkamuthur, 14.6.1967, *Deb* 30241; Selvapuram, 1.8.1968, *Chandrabose* 30550; Anakatti, 11.1.1971, *Viswanathan* MVV882 (MH); Dharmapuri district, Dharmapuri, Cauvery bank, 20.12.1978, *Matthew* 20595 (CAL); Kan-

niyakumari district, Tambraparani riverside, Kuzhithurai, 2.8.1977, *Henry* 49551; Madurai district, Periakolam riverside, January 1899, *Barnes s.n.*; Sorimalai, 18.2.1958, *Subramanyam* 5368 (MH); Alagar hills, 29.1.2007, *Shendage* SMS2533 (SUK); Nilgiri district, Sirur to Masipatti, 17.11.1970, *Subba Rao* 37266; Moyar bank, 23.11.1971, *Rathakrishnan* 38989 (MH); Ramana-thapuram district, Piranmalai, Thiruppathur, 29.11.1977, *Nair* 52921 (CAL, MH); Ayyanarkoil, 24.2.1979, *Nair* 61404 (MH); Salem district, Krishnagiri, 25.12.1916, s. coll. 13903; Hogainakkal forest, 24.11.1964, *Vajravelu* 21916; Salem, Edappadi, 8.12.1978, *Matthew* 19821; South Arcot district, Pakkamalai R.F., Gingee, 21.1.1978, *Ramamurthy* 52884 (CAL); Thanjavur district, Mannai, 20.2.1988, *Ragupathy* 538; Tirunelveli district, Mundanthorai, 28.6.1899, *Barber* 616 (MH); Kadayannallur, 25.9.1917, s. coll., s.n.; **Uttarakhand**, Dehra Dun district, New forest, Dehra Dun, November 1932, *Raizada* 87447 (MH). **Uttar Pradesh**, Banda district, Rocky hill, near a ruined temple, 26.3.1901, *Bell* 186; Jhana district, Jhana, 15.11.1897, *Ryan s.n.* (CAL). **West Bengal**, Bengal, without precise locality, s. die, *Hooker & Thomson s.n.*; Bengal, 27.12.1866, *Clarke s.n.* (CAL). Burdwan district, Bhedie, 15.2.1965, *Dutt* 674; Calcutta district, Azad Hindbag, 5.12.1965, *Banerjee* 95; Howrah district, Dentli, 31.5.1963, *Bennet* 3658; Koch Bihar district, Madhubhasa village, inside Attiampohar forest, 14.3.1984, *Banerjee* 15398; Midnapure district, Chilkigarh, 22.11.1975, *Maji* 2123; Tapoban, 4.3.1976, *Maji* 2928; Murshidabad district, Bavanagar, 10.5.1966, *Guha Bakshi* 352; 24 Paraganas district, Goghat, Hooghly, 23.11.1961, *Hajra* 160; Village Diore, 26.4.1966, *Ganesh* 558957 (CAL). **Others**, Sagar Island, Handelketki, 15.11.1971, *Mukherjee* 8775 (CAL).

**Barleria prionitis** L. subsp. **pubiflora** (Benth. ex Hohen.) Brummitt & J.R.I. Wood, Kew Bull. 38: 436. 1983; Shetty & Singh, Fl. Rajasthan 2: 635. 1991; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 699. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 603. 2001; Almeida, Fl. Maharashtra 4(A): 16. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 22e**

*Barleria pubiflora* Benth. ex Hohen., Flora 32. 358. 1849.

Lectotype: Prope urbem Mangalore, *Hohenacker* 238b (Photo!, K). (Brummitt *et al.*, 1983).

*B. prionitis* L. subsp. *prionitis* var. *diacantha* Blatt. & Hallb., J. Bombay Nat. Hist. Soc. 26: 811. 1919, non *B. diacantha* Nees 1847; Bhandari, Fl. Ind. Desert: 299. 1978; Shetty & Singh, Fl. Rajasthan: 635. 1991



(as *dicantha*); Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009, **syn. nov.**

Type: Rajasthan, Jodhpur, *Barmer* 9165.

Shrubs, perennial, erect, up to 1.5 m high, much branched, armed. Stems terete or 4-angled, glabrous; thorns simple, 8 or more per node, 1 – 3.5 cm long, whitish. Leaves ovate or elliptic, 6 – 16 × 4 – 9 cm, attenuate at base, ciliate at margins, cuspidate at apex, glabrous above, more or less pubescent beneath, especially on veins; lateral veins 4 – 6 pairs; petioles 0.5 – 3 cm long, grooved above. Flowers sessile, often solitary in lower axils, becoming spicate above, rarely in simple dichasial cymes, 5 – 7 cm long; bracts linear-lanceolate, 1.2 – 2 cm long, cuspidate at apex. Outer sepals linear-lanceolate, subequal, 1.5 – 2.3 × 0.4 – 0.5 cm, cuspidate at apex, appressed-hairy inside; inner sepals linear-lanceolate, 1 – 1.5 cm long, cuspidate at apex. Corolla bilipped ( $\frac{1}{4}$ ), pubescent outside, pale to golden yellow; tube 1.5 – 2 cm long, swollen, curved and glabrous at base; upper lobes oblong-obovate, 2 – 2.5 × 0.6 – 1.5 cm, rounded at base, entire at margins, acute at apex; lower one oblong to broadly ovate, deeply lobed. Fertile stamens 2, exserted; filaments 2 – 3 cm long, glandular-pubescent at base, yellowish; anthers *c.* 5 mm long, yellow; sterile stamens 2, 1 – 2 mm long; anthers *c.* 1 mm long; staminode absent. Disc covering less than  $\frac{1}{4}$  of ovary. Ovary ovoid, *c.* 4 × 2 mm, glabrous; style terete, 2.5 – 3.5 cm long, hirsute at base; stigma linear, *c.* 1 mm long, sticky, pinkish. Capsules ovoid, 1.5 – 2 × 0.6 – 0.8 cm, compressed, 2-seeded. Seeds ovoid, 7.8 – 8.8 × 6.2 – 6.8 mm, subcordate at base, flattened on one side, clothed with copper-brown appressed hairs.

*Flowering & Fruiting:* August – January.

*Habitat:* Open dry rocky localities in deciduous forests

*Distribution:* World: India and Pakistan. India: Diu & Daman, Gujarat, Madhya Pradesh, Maharashtra, Punjab and Rajasthan.

*Specimens examined:* INDIA, **Diu & Daman**, Diu, Nagoa, 20.9.1964, *Rao* 102676 (BSI). **Gujarat**, Saurashtra, Sani Mar Island, 17.11.1962, *Rao* 1919; Gopnathshore, 7.10.1964, *Rao* 2088 (CAL). **Madhya Pradesh**, Indore district, Bheraghat, near Chorali, 18.4.1963, *Sastry* 84224 (BSI, CAL). **Maharashtra**, Dhule district, Umbarti, near Pimpalner, 7.1.2006, *Shendage* SMS2524; Nandurbar district, Dhulipada, near Navapur, 17.1.2006, *Shendage* SMS2525 (SUK). **Punjab**, Banda, 26.3.1901, *Bell* 186 (CAL). **Rajasthan**, Barmer district, Hills around Barmer,

near Devis Temple, 20.8.1957, *Puri* 23134; Hills around Barmer, near Devis Temple, 4.10.1960, *Rolla* 66860 (BSI); Udaipur district, Parshad, 12.4.1963, *Varma* 118; Hills around Barmer, near Devis Temple, 22.10.1975, *Shetty* 2302 (CAL).

#### Section: *Somalia* (Oliv.) Lindau

#### Key to the species

1. Leaves sessile; capsules 15 – 20 mm long ..... **B. stocksii**
1. Leaves petiolate; capsules 5 – 10 mm long ..... **B. hochstetteri**

***Barleria hochstetteri*** Nees in de Candolle, Prodr. 11: 231. 1847; Wight, Icon. Pl. Ind. Orient. 4: 4, t. 1528. 1850; Anderson, J. Linn. Soc., Bot. 7: 29. 1864; Clarke in Hooker, Fl. Brit. India 4: 483. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 336. 1911; Cooke, Fl. Bombay 2: 459. 1904; Bhandari, Fl. Ind. Desert: 266. 1978; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Shetty & Singh, Fl. Rajasthan 2: 634. 1991; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009.

Type: Fruticulus locis praeruptis rupestribus in monte cordafano, kotschy iter Nubicum n. 159 (Photo!, G-DC).

Shrubs, perennial, erect, up to 50 cm high. Stems terete, canescent-strigose when young. Leaves elliptic-oblong, 2 – 4 × 0.8 – 1.2 cm, attenuate at base, ciliate at margins, obtuse at apex, appressed-hairy; petioles 0.5 – 1.2 cm long. Flowers few in lax cymes; peduncles 0.5 – 2 cm long, hairy; bracts linear, 2 – 3 mm long. Outer sepals ovate, subequal, 0.8 – 1.4 × 0.8 – 1 cm, pubescent outside with glandular and eglandular hairs; one lobe faintly bifid at apex; inner sepals linear-lanceolate, 6 – 8 × 1 – 2 mm, acute at apex, pubescent outside, white. Corolla 1 – 2 cm long, glabrous, purple or lilac; tube *c.* 1 cm long; lobes oblong, 8 – 12 mm long, emarginate at apex. Fertile stamens 2, exserted; filaments *c.* 1.5 cm long; sterile stamens 3. Ovary *c.* 3 mm long, pubescent; style 5 – 10 mm long; stigma bifid. Capsules ovoid, 5 – 10 mm long, pubescent, 2-seeded. Seeds suborbicular, 2 – 2.5 mm across, covered with appressed hairs.

*Flowering & Fruiting:* November – March.

*Habitat:* Rocky localities in desert.

*Distribution:* World: Arabia, Eastern Tropical Africa, Iran, Pakistan (Baluchistan, Sind) and India. India: Gujarat and Rajasthan.

*Specimens examined*: INDIA, Gujarat, Kachchh district, Bhuj, 27.9.1952, *Dhruna* 339805 (CAL); Near lake Bhavasar, 28.9.1964, *Rao* 103096 (BSI).

**Barleria stocksii** T. Anderson, J. Linn. Soc., Bot. 9: 493. 1867; Clarke in Hooker, Fl. Brit. India 4: 489. 1884; Gamble, Fl. Madras 2: 743. 1924; Vijaya Sankar, Zoo's Print 20: 1820. 2005; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009.

Type: Herb. T. Anderson, Malabar district, Bababoodan hills, *Law s.n.* (CAL!).

Herbs, perennial, suffruticose, up to 1 m high. Stems terete, sparsely hairy. Leaves sessile, elliptic-ovate, 3 – 5 × 1 – 3 cm, glabrescent, rounded at base, entire, ciliate or rarely denticulate at margins, subacute at apex. Flowers solitary, axillary or in terminal racemes; bracts linear-lanceolate, 2.2 – 2.8 × 0.5 – 1.5 cm, ciliate at margins, acute at apex, hairy on veins outside. Outer sepals subequal, 1.8 – 2.6 × 0.2 – 0.4 cm, ciliate at margins, acuminate at apex; one lobe bifid up to 1.5 cm deep; inner sepals 1.2 – 1.6 × 0.1 – 0.2 cm, ciliate at margins, acuminate at apex. Corolla c. 5 cm long, pink; lobes broadly obovate, emarginate at apex. Fertile stamens 2, exserted. Ovary covered by disc at base. Capsules obovoid, 1.5 – 2 cm long, 2-seeded. Seeds discoid, c. 8 × 6 mm, clothed with dense appressed hairs.

*Flowering & Fruiting*: July – December.

Habitat: Moist shady places in semi-evergreen forests.

*Distribution*: India: Andhra Pradesh and Karnataka. Endemic.

*Specimens examined*: INDIA, Western India, without precise locality, *s. die*, *Gibson s.n.* (CAL). **Andhra Pradesh**, East Godavari district, Maredumalli, 2001, *K.N. Reddy* 79607 (FRLH).

*Notes*: The type was collected by Stocks from Bababoodan hills, Karnataka and described by Anderson in 1867. After that it was collected by Gamble from Gooty, Andhra Pradesh during 1883 – 1889. It was neither collected nor reported after Gamble. Vijaya Sankar *et al.* (2005) reported its occurrence based on collections made after more than a century by Reddy from Maredumalli, Andhra Pradesh in 2001. However, further intensive explorations are required to assess its distribution, population size and threat status.

**Section: Cavirostrata** M. Balkwill

### Key to the species

1. Seeds hairy ..... **B. montana**
1. Seeds glabrous ..... 2

2. Outer sepals 2.5 – 4 cm long; corolla 6 – 8 cm long, pink; capsules 2 – 3 cm long ..... 3

2. Outer sepals 5 – 6 cm long; corolla more than 12 cm long, white; capsules 3 – 4.5 cm long ..... **B. grandiflora**

3. Stems slender; corolla bilipped; stamens eglandular at base ..... **B. prattensis**

3. Stems stout; corolla not bilipped; stamens glandular-pubescent at base ..... **B. gibsonii**

**Barleria gibsonii** Dalzell, Hooker's. J. Bot. Kew Gard. Misc. 2: 339. 1850; Dalzell & Gibson, Bombay Fl.: 189. 1861; Anderson, J. Linn. Soc., Bot. 9: 493. 1867; Curtis, Bot. Mag. 93(3): 23, t. 5628. 1867; Clarke in Hooker, Fl. Brit. India 4: 487. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 337. 1911; Cooke, Fl. Bombay 2: 464. 1904; Gamble, Fl. Madras 2: 743. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 62. 1952 & J. Bombay Nat. Hist. Soc. 51: 362. 1953; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Sharma *et al.*, Fl. Karnataka: 202. 1984; Saxena & Brahmam, Fl. Orissa 3: 1332. 1995; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 291. 1997; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 698. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 600. 2001; Almeida, Fl. Maharashtra 4(A): 12. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009. **Fig. 16, 20i**

Type: Herb. Bombay, *Dalzell s.n.* (Photo!, K).

*Barleria mackenii* Hook.f., Bot. Mag. 96: t. 5866. 1870, **syn. nov.**

Type: Hook.f., Bot. Mag. 96: t. 5866. 1870.

*Barleria gibsonioides* Blatt., J. Bombay Nat. Hist. Soc. 32: 733, t. 1. 1928; Santapau, Bot. Mem. Univ. Bombay 2: 64. 1952; Sundararaghavan & Singh in Jain & Sastry, Pl. Conserv. Bull. 3: 4. 1983 & J. Econ. Taxon. Bot. 5: 160. 1984; Singh & Sundararaghavan, J. Econ. Taxon. Bot. 8: 33. 1986; Sharma & Kulkarni in Nayar & Sastry, Red Data Book Ind. Pl. 2: 1. 1988; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 600. 2001; Mishra & Singh, Endang. Threat. Fl. Pl. Maharashtra: 178. 2001; Almeida, Fl. Maharashtra 4(A): 12. 2003; Puneekar *et al.*, Indian J. Forest. 26: 267. 2003; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009, **syn. nov.**

Type: India, Maharashtra, Godowli, near Panchgani, October 1927, *Blatter* 2 (Isotypes, BLAT!).

*Barleria montana* sensu Clarke in Hooker, Fl. Brit. India 4: 487. 1884, non Nees 1832.

Vernacular Name: *Gura* (Marathi).

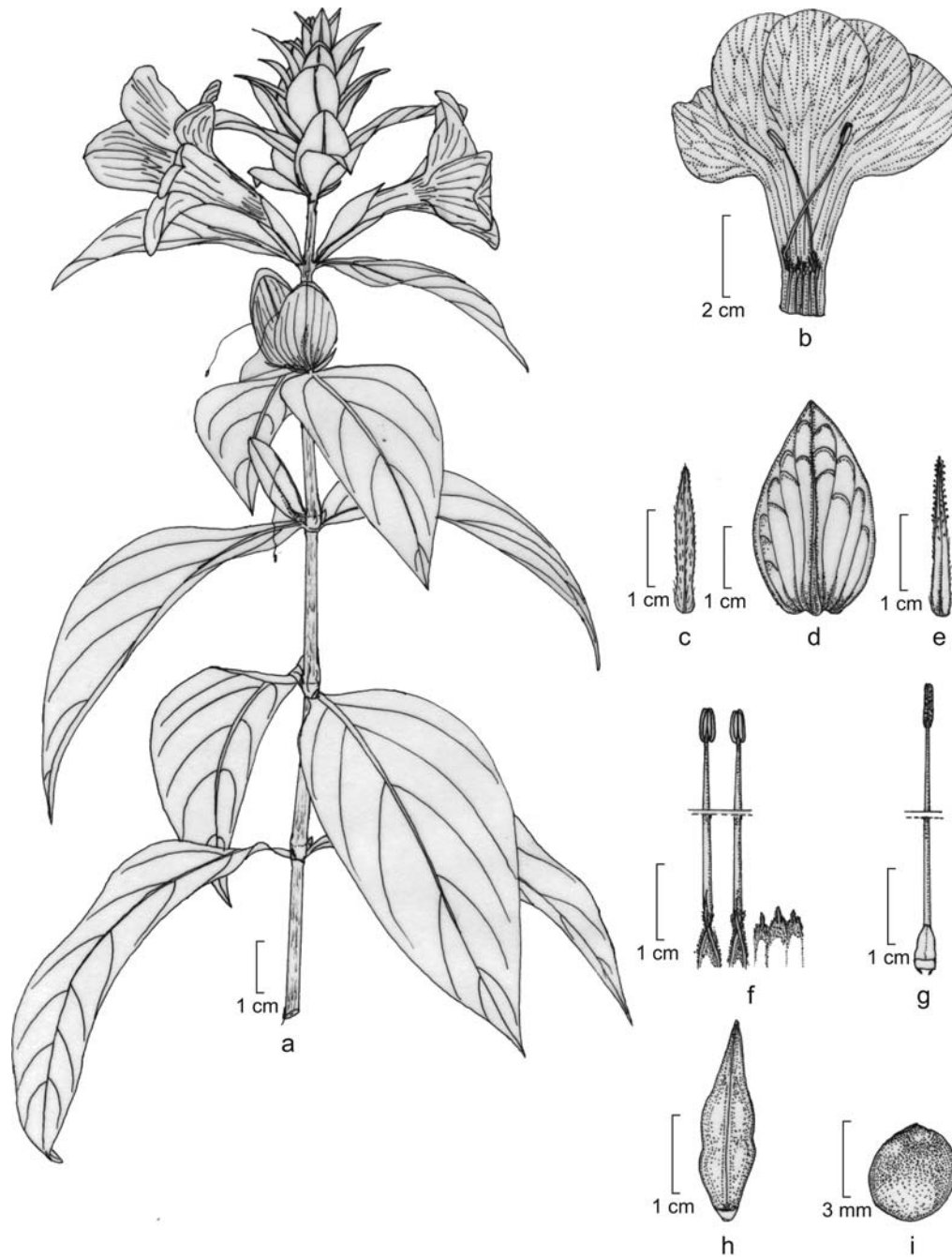


Fig. 16. *Barleria gibsonii* Dalzell: a. Flowering twig; b. Corolla split open; c. Bract; d. Outer sepal; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

Herbs or undershrubs, perennial, erect or suffruticose, up to 1 m high. Stems terete, angular, glabrous. Leaves ovate-elliptic, 7 – 17 × 5 – 9 cm, rounded, cuneate or shortly decurrent at base, scabrous at margins, acute to acuminate at apex, lineolate above, glabrous, glaucous beneath; lateral veins 5 – 8 pairs; petioles 1 – 2.5 cm long. Flowers solitary, axillary and in terminal spikes; bracts linear, 1 – 2 × 0.4 – 0.8 cm, acute at apex. Outer sepals elliptic-oblong or ovate-oblong, subequal, 2.5 –

3.5 × 1.8 – 2.3 cm, rounded at apex, glaucous, palmately nerved; midrib hairy above; inner sepals linear-lanceolate, 1 – 1.5 cm long, ciliolate at margins, acute at apex, glandular-pubescent, 1-veined. Corolla 6 – 8 cm long, glabrous, pink-purple; tube 3 – 4 cm long; lobes obovate, subequal, 2.5 – 3.5 × 2 – 2.8 cm, rounded at apex, with or without mauve blotches on two lateral lobes. Fertile stamens 2, exserted; filaments 2.5 – 4 cm long, glandular-pubescent at base; anthers c. 4 mm long,



violet; staminodes 3, c. 2 mm long, much reduced, glandular-pubescent. Disc covering less than  $\frac{1}{4}$  of ovary. Ovary ovoid, c.  $4 \times 2$  mm, glabrous; style slender, 4 – 5 cm long, glabrous; stigma linear, papillate, 2-lobed, violet. Capsules oblong-lanceoloid,  $2 - 2.5 \times 0.5 - 1$  cm, glabrous, turgid. Seeds subglobose,  $5 - 6 \times 4 - 5$  mm, glabrous, dark brown.

*Flowering & Fruiting:* September – March.

*Habitat:* Grassy hilltops and slopes at higher altitudes.

*Distribution:* India: Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu. Endemic.

*Specimens examined:* INDIA, **Karnataka**, Concan, *s. die*, Stocks *s.n.* (CAL); Jungle near Mercara, *s. die*, Beddome *s.n.* (MH). **Maharashtra**, Buldhana district, Wasali forest, 8.10.1982, Diwakar 164563 (BSI); Nandad district, Ambadi, 19.8.1970, Naik 888; Fuqadigudda, 8.9.1979, Zate 1961; Fuqadigudda, 5.10.1980, Zate 1472 (BAMU); Pune district, Kurli, Khed, 3.11.1961, Janardhanan 72986; Ganesh Caves, Junner, 27.9.1968, Hemadri 118135 (BSI); Durgawadi, near Junnar, 24.2.2007, Shendage SMS2542; Satara district, Ajankyatara, 23.12.2005, Shendage SMS2522 (SUK); Yavatmal district, Tipeshwar R.F., 25.9.1978, Karthikeyan 156612 (BSI).

*Notes:* *Barleria mackenii* described by Hooker in 1870, from Latin Goldfields district of Natal Colony, Southeast Africa, closely resembles *B. gibsonii* Dalzell. Distinguishing characters given by Blatter (1928) for *B. gibsonoides* also show large variation within the species as well as overlap with *B. gibsonii*. Field studies, observations in laboratory, consultation of herbarium and comparison of protologues strongly indicate that the three species viz., *B. mackenii*, *B. gibsonioides* and *B. gibsonii* are conspecific. Therefore, *B. mackenii* and *B. gibsonioides* are synonymised under *B. gibsonii* here. Flowers open between 9 and 11.30 am and remain till next day.

**Barleria grandiflora** Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 339. 1850; Dalzell & Gibson, Bombay Fl.: 189. 1861; Anderson, J. Linn. Soc., Bot. 9: 493. 1867; Clarke in Hooker, Fl. Brit. India 4: 488. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Cooke, Fl. Bombay 2: 463. 1904; Talbot, For. Fl. Bombay 2: 336. 1911; Santapau, Bot. Mem. Univ. Bombay 2: 62. 1952; Sharma *et al.*, Fl. Karnataka: 202. 1984; Mishra & Singh, Endang. Threat. Fl. Pl. Maharashtra: 179. 2001; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 600. 2001; Yadav & Sardesai, Fl. Kolhapur: 353.

2002; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009. **Fig. 17, 21a**

Type: Tulikut Ghat in Syahadri, Dalzell *s.n.* (Photo!, K).

*Barleria grandifolia* R. Br. ex T. Anderson, J. Proc. Linn. Soc., Bot. 7: 30. 1864.

Type: Monte Sinai, prope Adoam oppidum Abyssinicum, Schimper 702.

*Barleria grandis* sensu Almeida, Fl. Maharashtra 4(A): 13: 2003, non Hochst. ex Nees 1847.

Vernacular Name: *Dev Koranti* (Marathi).

Shrubs, perennial, erect, up to 1.5 m high. Stems terete to subangular, glabrous, puberulous at nodes. Leaves elliptic,  $15 - 22 \times 5 - 8$  cm, cuneate at base, ciliate at margins, acuminate at apex, coriaceous, glabrous, glaucous beneath; lateral veins 6 – 9 pairs; petioles 2 – 3 cm long. Flowers solitary, axillary or in terminal spikes; bracts linear-lanceolate,  $1 - 2 \times 0.2 - 0.4$  cm, acute at apex. Outer sepals ovate-oblong, subequal,  $5 - 6 \times 3 - 4$  cm, rounded at base, ciliate at margins, acuminate at apex, glabrous outside, glandular-pubescent inside; one of the sepals faintly bifid at apex; inner sepals linear,  $1.5 - 2 \times 0.2 - 0.3$  cm, acuminate at apex, densely glandular-pubescent. Corolla bilipped ( $\frac{1}{4}$ ), c. 15 cm long, glandular-pubescent outside, white; tube 8 – 9.5 cm long; lobes obovate,  $3 - 4.5 \times 2 - 3$  cm, obtuse at apex. Fertile stamens 2, exserted; filaments 7 – 8 cm long, glandular-pubescent at base; anthers c. 1 cm long; sterile stamens 2, glandular-pubescent on lower half; staminode 1, glandular-pubescent. Ovary oblongoid, c.  $6 \times 3$  mm, glandular-pubescent; style slender, 10 – 12.5 cm long, glabrous; stigma sticky, unequally 2-lobed, violet. Capsules oblongoid,  $3 - 4.5 \times 0.8 - 1.2$  cm, turgid below, glandular-pubescent, 4-seeded. Seeds broadly oblongoid,  $8 - 10 \times 6.5 - 7.5$  mm, obtuse at apex, glabrous, dark brown.

*Flowering & Fruiting:* October – February.

*Habitat:* Exposed forest margins, along roadsides and hillslopes; occasionally grown in home gardens.

*Distribution:* India: Goa, Karnataka and Maharashtra. Endemic and Rare.

*Specimens examined:* INDIA, **Karnataka**, South Konkan, *s. die*, Law *s.n.*; Concan, Herb. T. Anderson, *s. die*, Stocks *s.n.*; Karwar district, Near Yellapur, 29.10.1884, Talbot 69577 (MH); Near Yellapur, 5.11.1885, Talbot 1085 (CAL); Dandeli – Ansi Road, 25.12.2005, Shendage SMS2523 (SUK); Shimoga district, Kundadaguda, Agumbe, 15.10.1962, Raghavan

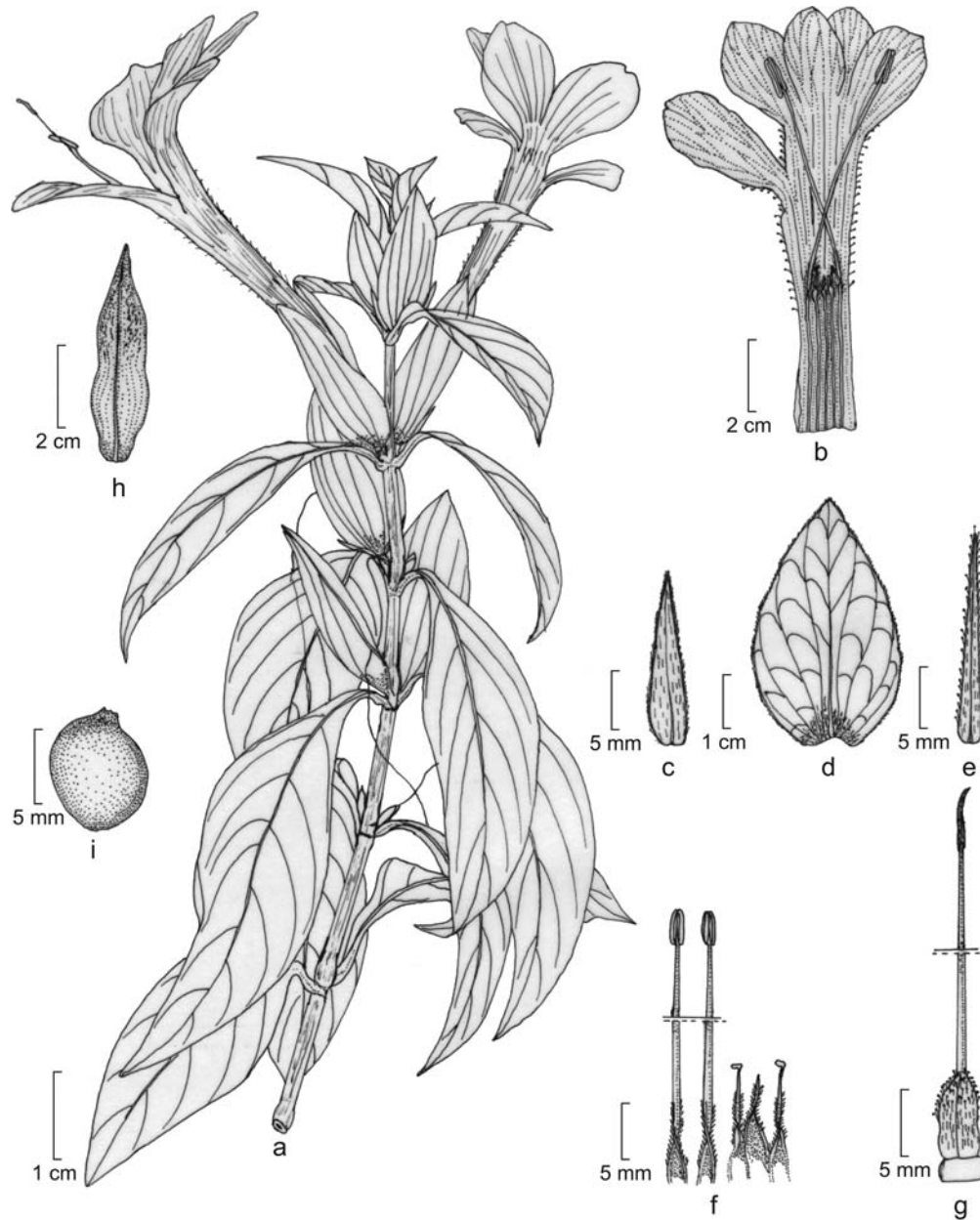


Fig. 17. *Barleria grandiflora* Dalzell: a. Flowering twig; b. Corolla split open; c. Bract; d. Outer sepal; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.

83244 (CAL). **Maharashtra**, Kolhapur district, Saticha Maal, *s. die*, Sardesai 764; Shelap, *s. die*, Sardesai 672; Tambyachiwadi, *s. die*, Sardesai 1413; Valvan village – Dajipur road, 10.12.2005, Shendage SMS2519; Pune district, Varand ghat, 15.11.2005, Shendage SMS2508 (SUK).

*Note*: Flowers open between 12 noon and 3 pm and remain open till next two days.

***Barleria montana*** Nees in Wallich, Pl. Asiat. Rar. 3: 92. 1832 & in de Candolle, Prodr. 11: 232. 1847; Dalzell & Gibson, Bombay Fl.: 189. 1861; Anderson, J. Linn. Soc., Bot. 9: 493. 1867; Beddome, Icon. Pl.

Ind. Or.: 62, t. 257. 1872; Clarke in Hooker, Fl. Brit. India 4: 487. 1884; Woodrow, J. Bombay Nat. Hist. Soc. 12: 356. 1899; Talbot, Syst. List. Trees Bombay 2: 266. 1902 & For. Fl. Bombay 2: 336. 1911; Cooke, Fl. Bombay 2: 461. 1904; Haines, Bot. Bihar Orissa 4: 684. 1922; Gamble, Fl. Madras 2: 743. 1924; Santapau, Bot. Mem. Univ. Bombay 2: 60. 1952 & J. Bombay Nat. Hist. Soc. 51: 362. 1953; Matthew, Fl. Tamilnadu Carnatic: 1164, t. 90g. 1983 & Fur. Ill. Fl. Tamilnadu Carnatic: t. 447. 1988; Sharma *et al.*, Fl. Karnataka: 202. 1984; Saxena & Brahmam, Fl. Orissa 3: 1332. 1995; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 292. 1997; Moulali in

Pullaiah & Moulali, Fl. Andhra Pradesh 2: 699. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 602. 2001; Almeida, Fl. Maharashtra 4(A): 14. 2003; Nayar *et al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009. **Fig. 18, 21g**

Type: East Montibus, Travancorae, Wall., Numer. Cat. No. 2391.

*Barleria morrisiana* E. Barnes & C.E.C. Fisch., Bull. Misc. Inform. 1939: 659. 1939; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 6. 2009, **syn. nov.**

Type: South India, Mysore, Biligirirangan hills, near Punjur, June 1939, *Barnes* 2155 (Photo!, K).

Vernacular Names: *Kolista* (Marathi); *Adavi Decembaralu* (Telugu).

Herbs, perennial, up to 60 cm high. Stems terete, glabrous. Leaves ovate or elliptic-lanceolate, 7 – 13 × 2.5 – 5 cm, attenuate at base, ciliate at margins, acute at apex, glabrous, glaucous beneath; lateral veins 5 or 6 pairs; petioles 1.5 – 2.5 cm long. Flowers solitary, sessile or subsessile, axillary or in terminal spikes; bracts linear-oblong, 2 – 3 cm long, ciliate

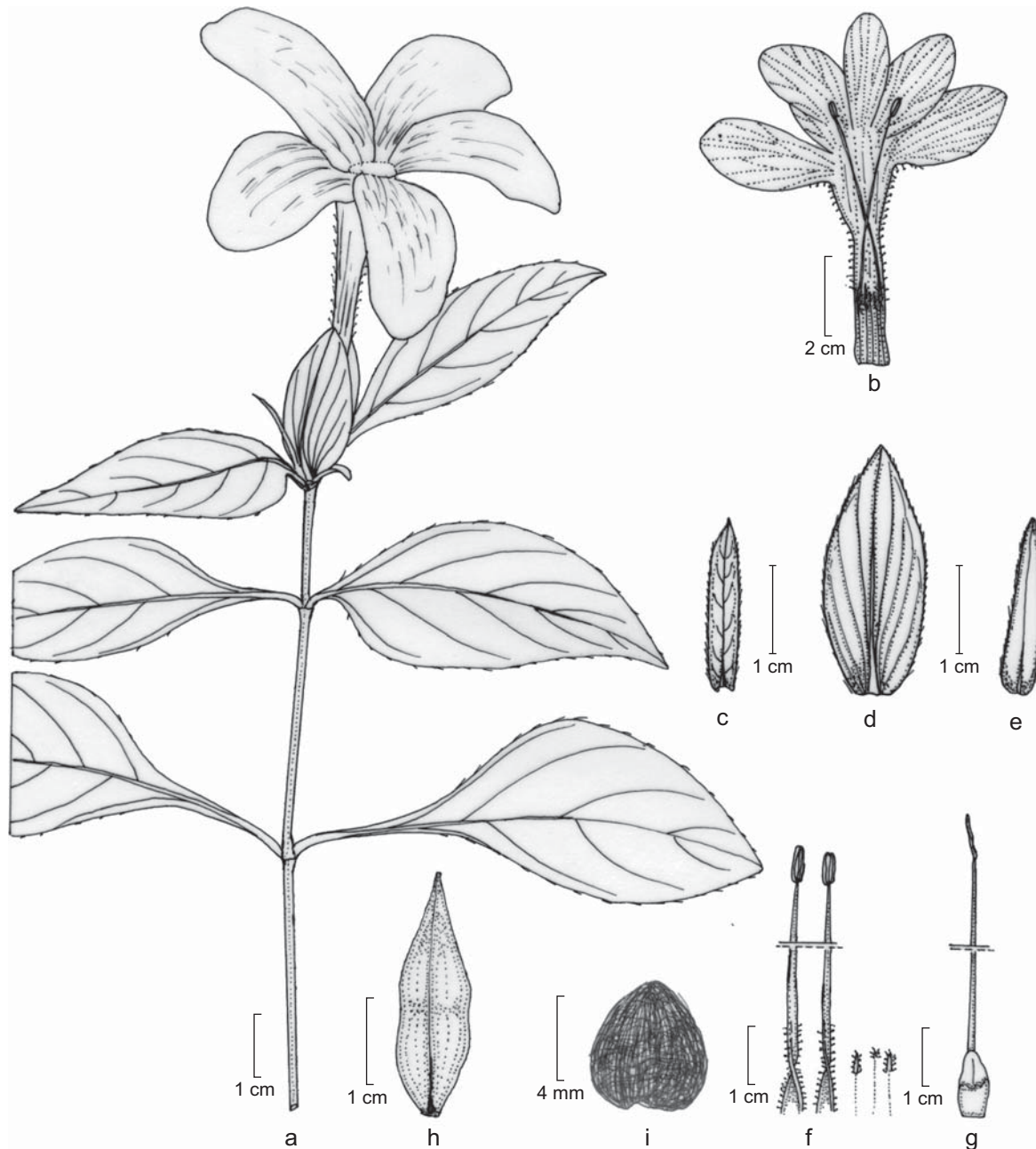


Fig. 18. *Barleria montana* Nees: a. Flowering twig; b. Corolla split open; c. Bract; d. Outer sepal; e. Inner sepal; f. Stamens; g. Pistil; h. Capsule; i. Seed.



at margins, acute at apex, glabrous. Outer sepals ovate, subequal,  $3-4 \times 1.2-2$  cm, rounded at base, ciliate at margins, acute at apex, glabrous, strongly nerved, brown; inner sepals linear-lanceolate,  $1.2-1.8 \times 0.2-0.3$  cm, acute at apex, glabrous; midrib distinct. Corolla  $7-9.5$  cm long, glandular-pubescent outside, pink; tube  $5-5.5$  cm long; lobes oblong-obovate, subequal,  $2.5-4 \times 1-2$  cm, emarginate at apex. Fertile stamens 2, exerted; filaments  $3.5-4$  cm long, glandular-hirsute at base; anthers  $3-4$  mm long; staminodes 3,  $1-2$  mm long, glandular-hirsute. Disc covering  $\frac{1}{2}$  of ovary. Ovary ovoid,  $4-5$  mm long, glabrous; style slender, up to  $4$  cm long, glabrous; stigma linear,  $c. 2$  mm long, 2-lobed. Capsules oblong-lanceoloid,  $2.5-3 \times 0.5-0.6$  cm, glabrous. Seeds ovoid or subquadroid,  $4.5-6$  mm, clothed with appressed-silky hairs.

*Flowering & Fruiting*: October – February.

*Habitat*: On exposed hill slopes above 1000 m.

*Distribution*: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu. Endemic.

*Specimens examined*: INDIA, **Andhra Pradesh**, Chittoor district, near Eethakayala mandapam, 31.12.1975, *Subba Rao* 46912 (CAL, MH); Talakona, 7.11.1987, *Charyulu* 1768 (MH); Godavari district, Polavaram, January 1885, *Gamble* 15880 (CAL). **Karnataka**, Mandya district, Adichunchangiri, 18.12.1978, *Murthy & Sreenath* 5021 (CAL). **Maharashtra**, Nandad district, Chikaldhara-Muktagiri, 19.8.1970, *Naik* 841; Northern forest, 8.11.1979, *Zate* 1130 (BAMU). **Tamil Nadu**, Dharmapuri district, Sokkampatti, Chitheri, 26.12.1990, *Ravishankar* 95543 (MH); Madurai district, Alagarcoil R.F., 28.2.1978, *Chandrabose* 53412 (CAL, MH); Alagar hill, 29.1.2007, *Shendage* SMS2536 (SUK).

Note: Flowers open between 7.00 and 9.00 am and remain till the next day.

***Barleria prattensis*** Santapau, Kew Bull. 3: 487. 1949; Bot. Mem. Univ. Bombay 2: 62. 1951 & Rec. Bot. Surv. India 16(1): 179. 1960; Sundararaghavan *et al.*, Checklist Pl. Gujarat: 65. 1981; Malhotra & Rao, Bull. Bot. Surv. India 22: 8. 1982; Matthew, Fl. Tamilnadu Carnatic: 1166. 1983; Sharma *et al.*, Fl. Karnataka: 203. 1984; Rao, Fl. Goa 2: 319. 1986; Shetty & Singh, Fl. Rajasthan 2: 634. 1991; Khanna *et al.* in Mudgal *et al.*, Fl. Madhya Pradesh 2: 292, f. 294. 1997; Moulali in Pullaiah & Moulali, Fl. Andhra Pradesh 2: 699. 1997; Naithani *et al.*, Forest Fl. Goa: 472. 1997; Moorthy in Singh *et al.*, Fl. Maharashtra State, Dicotyl. 2: 602. 2001; Almeida, Fl. Maharashtra 4(A): 15, t. 1, p. 4. 2003; Sasidharan, Biodiv. Doc. Kerala Pt. 6: Fl. Pl. 339. 2004; Nayar *et*

*al.*, Fl. Pl. Kerala – Handb.: 14. 2006; Karthikeyan *et al.*, Fl. Pl. India – Dicotyl. 1: 7. 2009. **Fig. 19, 22c**

Type: India, Maharashtra, Khandala, *Santapau* 1228 (BLAT!).

*Barleria montana* auct. non Nees, 1832: Beddome, Icon. Pl. Ind. Or.: t. 257. 1868; Cooke, Fl. Bombay 2: 461. 1904.

Vernacular Names: *Madurakurinji* (Malayalam); *Gulabi Koranti, Ikharu* (Marathi).

Herbs or undershrubs, perennial, erect or suffruticose, up to 1 m high. Stems terete, deeply grooved, glabrous, puberulous at nodes. Leaves elliptic-oblong to lanceolate,  $6-15 \times 2-7$  cm, attenuate at base, ciliate at margins, acuminate at apex, coriaceous, glabrous, glaucous beneath; lateral veins 5 or 6 pairs; petioles  $0.5-3$  cm long. Flowers solitary or in pairs, terminal; pedicels  $c. 5$  mm long, occasionally up to 8 cm long; bracts linear-lanceolate,  $0.5-1.5 \times 0.1-1$  cm, ciliate at margins, acuminate at apex, pubescent or subglabrous. Outer sepals much variable, ovate,  $2.5-4 \times 1.5-2$  cm, rounded at base, ciliate at margins, acute at apex, glabrous outside, puberulous inside; midrib often reddish brown; inner sepals linear-lanceolate,  $1-1.8$  cm long, ciliate at margins, acuminate at apex, pubescent on veins outside. Corolla bilipped ( $\frac{1}{4}$ ),  $6-8$  cm long, glandular-pubescent to glabrous outside, pink; tube  $3-4.5$  cm long, whitish; lobes obovate, subequal,  $1.5-2.5 \times 1-2$  cm, obtuse at apex. Fertile stamens 2, exerted; filaments  $2-3.5$  cm long, glabrous, pinkish towards apex; anthers  $c. 4$  mm long; staminodes 3,  $1-1.5$  cm long, glabrous. Disc covering  $\frac{1}{3}$  of ovary. Ovary oblong-ovoid,  $c. 4 \times 2$  mm, glabrous; style slender,  $4-5$  cm long, glabrous, pinkish towards apex; stigma linear, 2-lobed, brown. Capsules ovate-lanceoloid,  $2-3 \times 0.5-0.8$  cm, turgid. Seeds broadly ovoid to subglobose,  $4.5-6 \times 4-5$  mm, glabrous, brown.

*Flowering & Fruiting*: September – February.

*Habitat*: Undergrowth in deciduous forests.

*Distribution*: India: Andhra Pradesh, Dadra & Nagar Hevali, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. Endemic.

*Specimens examined*: INDIA, **Goa**, Goodies, one mile beyond Mangaon, way to Quepem, 9.11.1962, *Rolla* 84541; Near Chimbhel reservoir, 9.11.1962, *Rolla* 92899; Butpal, Kampal hill top, 10.11.1962, *Rolla* 84611; Sanguem – Banegaon mine area, 14.11.1962, *Rolla* 84777 (BSI, CAL); Arvolam, 7.10.1964, *Raghavan* 103373 (BSI); Maxem ghat, 12.10.1964, *Raghavan* 103559 (BSI, CAL); Camercona, 7.10.1997,

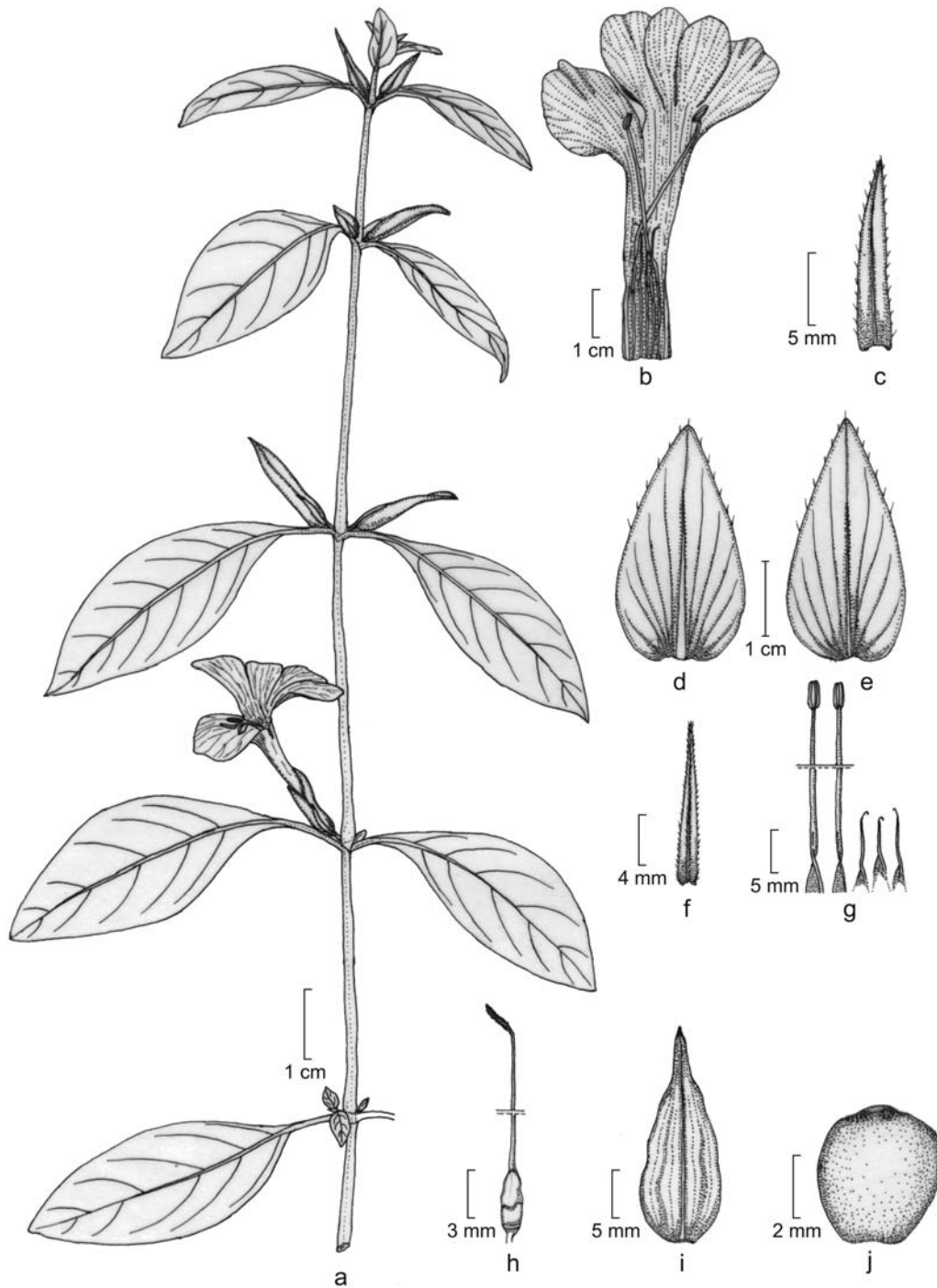


Fig. 19. *Barleria prattensis* Santapau: a. Flowering twig; b. Corolla split open; c. Bract; d, e. Outer sepals; f. Inner sepal; g. Stamens; h. Pistil; i. Capsule; j. Seed.

Joshi & Raj Kumar 1063 (GU). **Gujarat**, Dangs district, Bhavand garh, 22.11.1959, *Wadhwa* 60611; Sudir protected forest, 25.11.1959, *Wadhwa* 60854 (BSI); Pukhran, near Songarh, 23.1.2006, *Shendage* SMS2528 (SUK). **Karnataka**, Bengaluru district, Bannerghatta, 2.12.1978, *Saldanha & Sreenath* 4596 (CAL); Kolar district, Royalpad S.F., Srinivasapur, 21.9.1974, *Singh* 133280 (BSI); Mysore district,

Biligiri Rangan hills, on the way to Bedaguli, 8.9.1978, *Ramesh* 2662 (CAL); Shimoga district, Tirthahalli, 19.10.1964, *Raghavan* 97448; Tumkur district, Ujjini S.F., Hiliyar, Durga Kumigal, 23.10.1975, *Singh* 140906 (BSI). **Kerala**, Palakkad district, Palghat hills, *Beddome s.n.* (MH). **Madhya Pradesh**, Hoshangabad district, Towa river bank, Bungalpur, 1.10.1960, *Joseph* 11165; Mandla district,



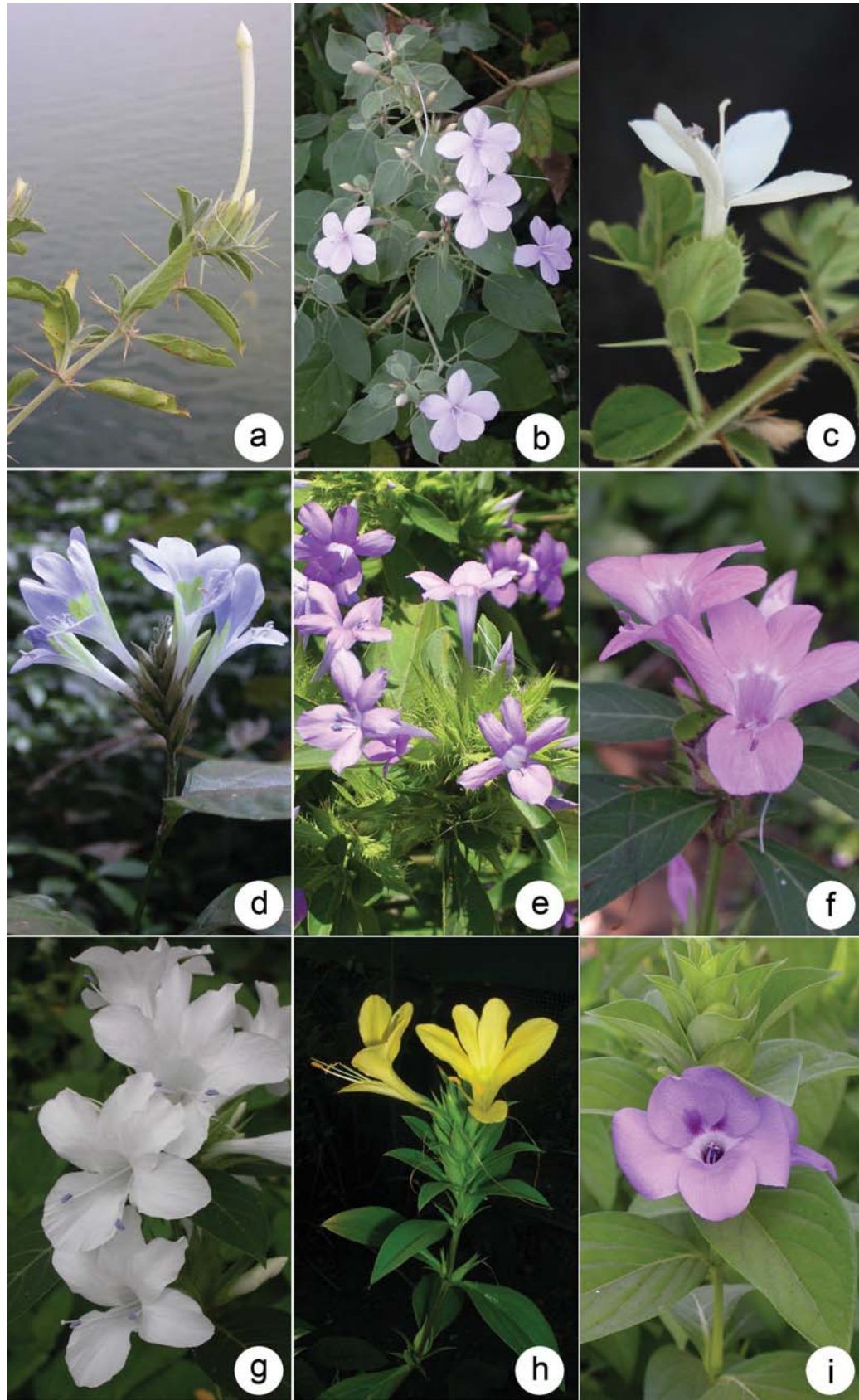


Fig. 20. a. *Barleria acanthoides* Vahl; b. *B. acuminata* Wight ex Nees; c. *B. buxifolia* L.; d. *B. courtallica* Nees; e, f. *B. cristata* L. (pink); g. *B. cristata* L. (white); h. *B. cuspidata* B. Heyne ex Nees; i. *B. gibsonii* Dalzell.



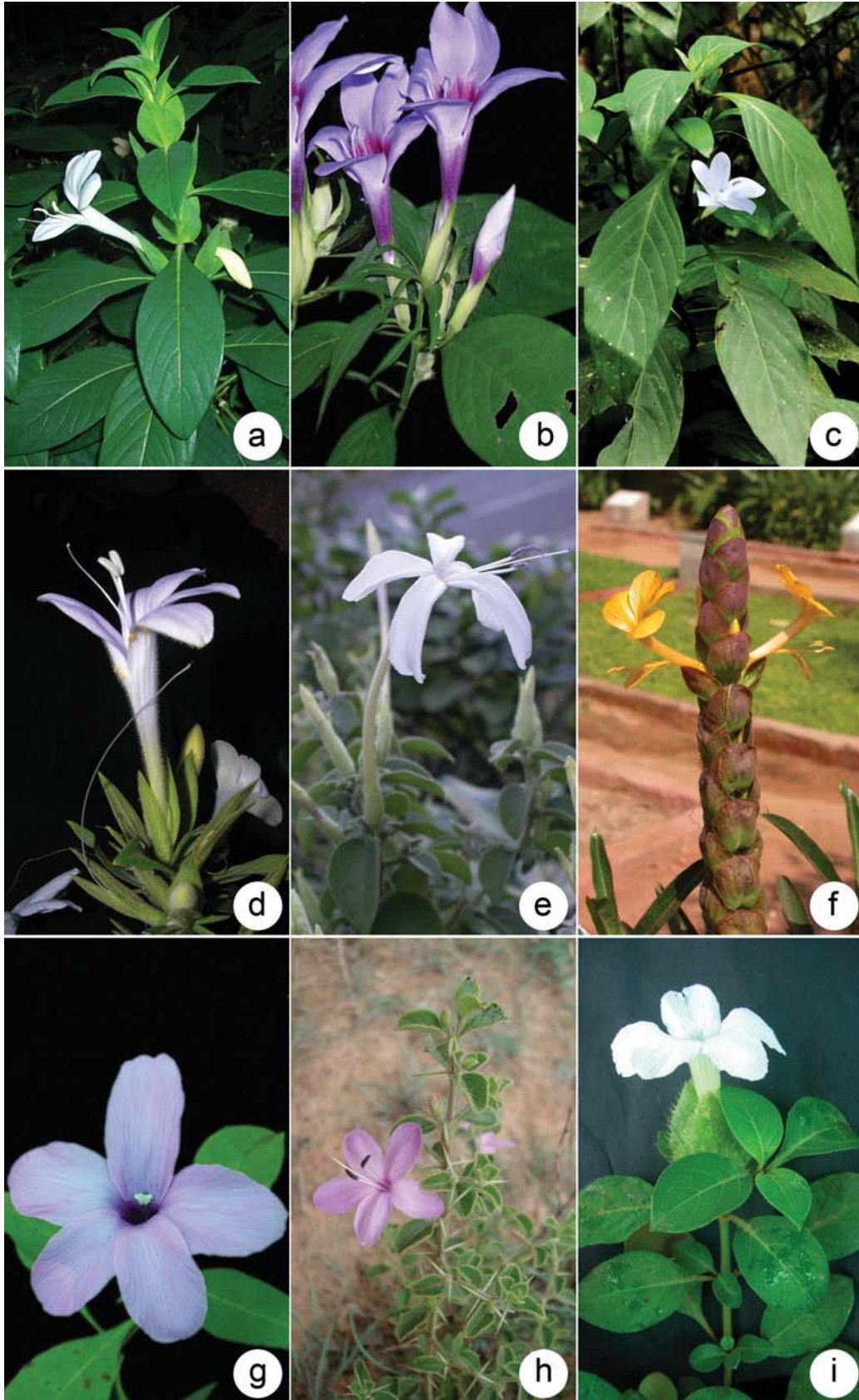


Fig. 21. a. *Barleria grandiflora* Dalzell; b. *B. involucrata* Nees var. *elata* (Dalzell) C.B. Clarke; c. *B. involucrata* Nees var. *involucrata*; d. *B. lawii* T. Anderson; e. *B. longiflora* L.f.; f. *B. lupulina* Lindl.; g. *B. montana* Nees; h. *B. mysorensis* Roth; i. *B. nitida* Nees.

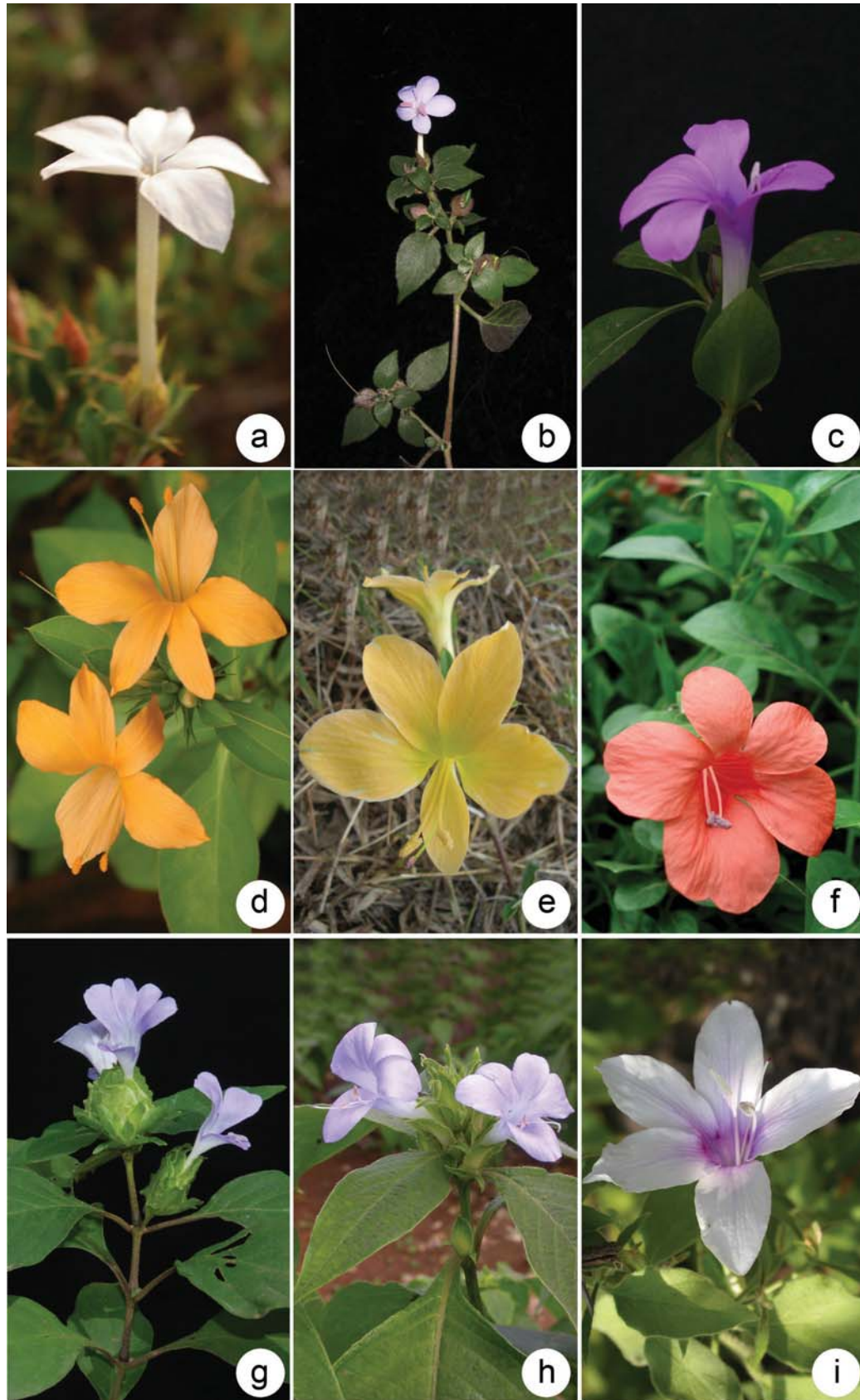


Fig. 22. a. *Barleria noctiflora* L.f.; b. *B. pilosa* B. Heyne ex Nees; c. *B. prattensis* Santapau; d. *B. prionitis* L. subsp. *prionitis*; e. *B. prionitis* L. subsp. *pubiflora* (Benth. ex Hohen.) Brummitt & J.R.I. Wood; f. *B. repens* Nees; g. *B. strigosa* Willd.; h. *B. terminalis* Nees; i. *B. tomentosa* Roth.



Khari R.F., 29.11.1961, *Joseph* 13478 (MH). **Maharashtra**, Dhule district, Charanmal, 16.1.2006, *Shendage* SMS2526 (SUK); Gondia district, Ranipore to Nagzira, 14.10.1966, *Pataskar* 110032 (BSI, CAL); Ratampur forest, 20.10.1966, *Patasker* 110252 (CAL); Nandurbar district, Dhulipada, near Navapur, 17.1.2006, *Shendage* SMS2527 (SUK); Nasik district, Sawana, on way to Gujarat border, 17.9.1967, *Chavan* 111464; Deodongara, Hansul, 29.9.1967, *Chavan* 112670; Deodongara, Hansul, 16.10.1983, *Narasimhan* 166094; Bombay, towards Palson, 20.10.1983, *Narasimhan* 166125; Zari, 18.9.1984, *Narasimhan* 167573 (BSI); Pune district, Army milk colony, 15.10.1950, *Bole* 5 (CAL); Ravine below Maluste, 29.1.1964, *Reddi* 101107 (BSI, CAL); Kate pani forest, Ambavne, 24.12.1964, *Reddi* 101007 (CAL); Varandh ghat, 15.11.2005, *Shendage* SMS2509; Khandala, 16.11.2005, *Shendage* SMS2511 (SUK); Thane district, Nandi forest, 22.1.1903, *Ryan* 379; Jootara, 23.9.1903, *Ryan* 1570; Chandip bassein, 14.10.1903, *Ryan* 1845; Kamara forest, Mahim forest, 12.11.1903, *Ryan* 1709; Palghar Mahim, 16.11.1903, *Ryan* 1825; Khadawali Kalyan, 17.11.1956, *Jain* 9382; Ratampure forest, 20.10.1966, *Pataskar* 110252 (BSI); Sawa R.F., 12.10.1967, *Billore* 113266 (CAL); Near Dolkhamb, Washala range, 15.10.1967, *Billore* 11818 (BSI, CAL); Sawa R.F., 23.10.1967, *Billore* 113206 (BSI); Gambhir garh, Udhawa range, 25.10.1967, *Billore* 113242 (BSI, CAL); Chalani R.F., Sawa range, 26.10.1967, *Billore* 113022; Dhanla R.F., near Vaugni, Badlapur range, 24.9.1968, *Billore* 115350; Kanheri caves, 6.10.1984, *Sharma* 167228 (BSI). **Nagar Haveli**, Dolara forest, 4.10.1963, *Ansari* 94134 (CAL); Umberkoi Dongerpada forest, 6.11.1970, *Ansari* 121953; Morkhal, 9.11.1970, *Ansari* 126730; Dudhani to Bildhari forest, 12.11.1970, *Ansari* 126914 (BSI). **Rajasthan**, Banswara district, Bhapar culture operation, 24.9.1961, *Kanodia* 75201; Anandsagar forest, 25.9.1961, *Kanodia* 75257; On way to Jaguar hills, Bhangra, 1.10.1961, *Kanodia* 75449; On the way from Bhongra to Ghantol, 2.10.1961, 75469; Bijhia forest, near Kushalgarh, 12.10.1961, *Kanodia* 75699 (BSI); Puna pathar forest block, 15.10.1976, *Singh* 3656 (CAL).

*Note:* Flowers open between 7.30 and 10.30 am and remain till next day.

#### Acknowledgements

We are thankful to the Head, Department of Botany, Shivaji University, Kolhapur, for providing laboratory facilities; to the curators and staffs of CAL, MH, BSI, BLAT, KFRI, BAMU, ATREE and Goa University, for providing facility for herbarium and library consultation; to Dr. P. Lakshminarasimhan, Central National Herbarium, Botanical Survey of India,

Kolkata and Ms. Frances Crawford and Dr. Iain Darbyshire, Royal Botanic Gardens, Kew, for providing photographs of some type specimens and valuable suggestions and to the Department of Biotechnology (DBT), New Delhi, for financial assistance.

#### Literature Cited

- Anderson, T. 1864.** Acanthaceae. *J. Proc. Linn. Soc., Bot.* 7: 15.
- Anderson, T. 1867.** Acanthaceae. *J. Linn. Soc., Bot.* 9: 489.
- Balkwill, M.J. & K. Balkwill 1997.** Delimitation and infra-generic classification of *Barleria* (Acanthaceae). *Kew Bull.* 52(3): 535 – 573.
- Balkwill, M.J. & K. Balkwill 1998.** A preliminary analysis of distribution pattern in a large, pantropical genus, *Barleria* L. (Acanthaceae). *J. Biogeography* 25: 95 – 110.
- Benoist, R. 1967.** Acanthaceae. In: Humbert, H. (Ed.), *Flore de Madagascar et des Comores* 182(1): 1 – 230. Tananarive: Imprimerie officielle; Muséum national d'histoire naturelle, Paris.
- Bentham, G. 1876.** Acanthaceae. In: Bentham, G. & J.D. Hooker (Eds.), *Genera Plantarum*. Vol. III, Part II. L. Reeve & Co., Ltd., London.
- Blatter, E. & McCann 1928.** Some New Species of Plants from the Western Ghats. *J. Bombay Nat. Hist. Soc.* 32: 733 – 738.
- Bremekamp, C.E.B. 1965.** Delimitation and subdivision of the Acanthaceae. *Bull. Bot. Surv. India* 7: 21 – 30.
- Burkill, I.H. & C.B. Clarke 1899.** Acanthaceae. In: Dyer, W.T.T. (Ed.), *Flora of Tropical Africa*. Vol. 5. L. Reeve & Co., Ltd., London. pp. 140 – 169.
- Clarke, C.B. 1885.** Acanthaceae. In: Hooker, J.D. (Ed.), *The Flora of British India*. Vol. 4. L. Reeve & Co., Ltd., London. pp. 387 – 558.
- Clarke, C.B. 1901.** Acanthaceae. In: Dyer, W.T.T. (Ed.), *Flora Capensis*. Vol. 5, Part 1. L. Reeve & Co., Ltd., London. pp. 1 – 9.
- Cooke, T. 1901 – 1908.** *The Flora of the Presidency of Bombay*. Taylor & Francis, London.
- Cramer, L.H. 1998.** Acanthaceae. In: Dassanayake, M.D. (Ed.), *A Revised Handbook to the Flora of Ceylon*. Vol. 12. Oxford & IBH Publ. Co., Ltd., New Delhi. pp. 1 – 140.
- Forman, L. & D. Bridson 1989.** *The Herbarium Handbook*. Royal Botanic Gardens, Kew.



- Hutchinson, J. & J.M. Dalziel 1931.** Acanthaceae. In: Hepper, F.N. (Ed.), *Flora of West Tropical Africa*. Vol. 2. Royal Botanic Gardens, Kew. pp. 261 – 262.
- Karthikeyan, S., Sanjappa, M. & S. Moorthy 2009.** Acanthaceae. In: *Flowering Plants of India – Dicotyledons Volume I (Acanthaceae – Avicenniaceae)*. Botanical Survey of India, Kolkata. pp. 1 – 62.
- Lindau, G. 1895.** Acanthaceae. In: Engler, A. & K. Prantl (Eds.), *Die Natürlichen Pflanzenfamilien*. Teil 4, Abteilung 3b. Leipzig, W. Engelmann. pp. 274 – 353.
- Linnaeus, C. 1753.** *Species Plantarum*. Vol. 2. Impensis Laurentii Salvii, Stockholm. pp. 636 – 637.
- Mabberley, D.J. 2008.** *Mabberley's Plant-Book. A portable dictionary of plants, their classification and uses*. Third Edition. Cambridge University Press, Cambridge.
- McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold K., Nicolson, D.H., Pardo, J., Silva, P.C., Skog, J.E., Wiersema, J.H. & N.J. Turland 2006.** International Code of Botanical Nomenclature (Vienna Code). *Regnum Veg.*: 146. A.R.G. Gantner Verlag, Ruggell, Liechtenstein.
- Moorthy, S. 2001.** Acanthaceae. In: Singh, N.P., Lakshminarasimhan, P., Karthikeyan, S. & P.V. Prasanna (Eds.), *Flora of Maharashtra State (Dicotyledones)*. Vol. 2. Botanical Survey of India, Kolkata. pp. 589 – 689.
- Nees von Esenbeck, C.G.D. 1832.** Acanthaceae Indiae Orientalis. In: Wallich, N. (Ed.), *Plantae Asiaticae Rariores*. Vol. 3. Treuttel & Würtz, London. pp. 70 – 117.
- Nees von Esenbeck, C.G.D. 1847.** Acanthaceae. In: A.P. de Candolle (Ed.), *Prodromus Systematis Naturalis Regni Vegetabilis*. Vol. 11. Sump-tibus Sociorum Treuttel & Würtz, Paris. pp. 223 – 247.
- Obermeijer, A.A. 1933.** A Revision of the South African Species of *Barleria*. *Ann. Transvall Mus.* 15: 123 – 180.
- Oersted, A.S. 1854.** Mexico og Centralamerikas Acanthaceer. *Kjoeb. Vidensk. Meddel.*: 133 – 137.
- Ridley, H.N. 1923.** *The Flora of the Malay Peninsula*. Vol. 2. Gamopetalae. L. Reeve & Co., Ltd., London.
- Shetty, B.V. & V. Singh 1991.** *Flora of Rajasthan*. Vol. 2. Botanical Survey of India, Calcutta.
- Scotland, R.W. & K. Vollesen 2000.** Classification of Acanthaceae. *Kew Bull.* 55: 513 – 589.

---

Received: 30.12.2009

Revised and Accepted: 10.12.2010