

**FLORA
OF
BANGLADESH**

NO. 65

GESNERIACEAE

EDITORS

HOSNE ARA
And
BUSHRA KHAN

June 2016

By

SARDER NASIR UDDIN

**BANGLADESH NATIONAL HERBARIUM
MINISTRY OF ENVIRONMENT AND FORESTS
GOVT. OF THE PEOPLE'S REPUBLIC OF BANGLADESH**

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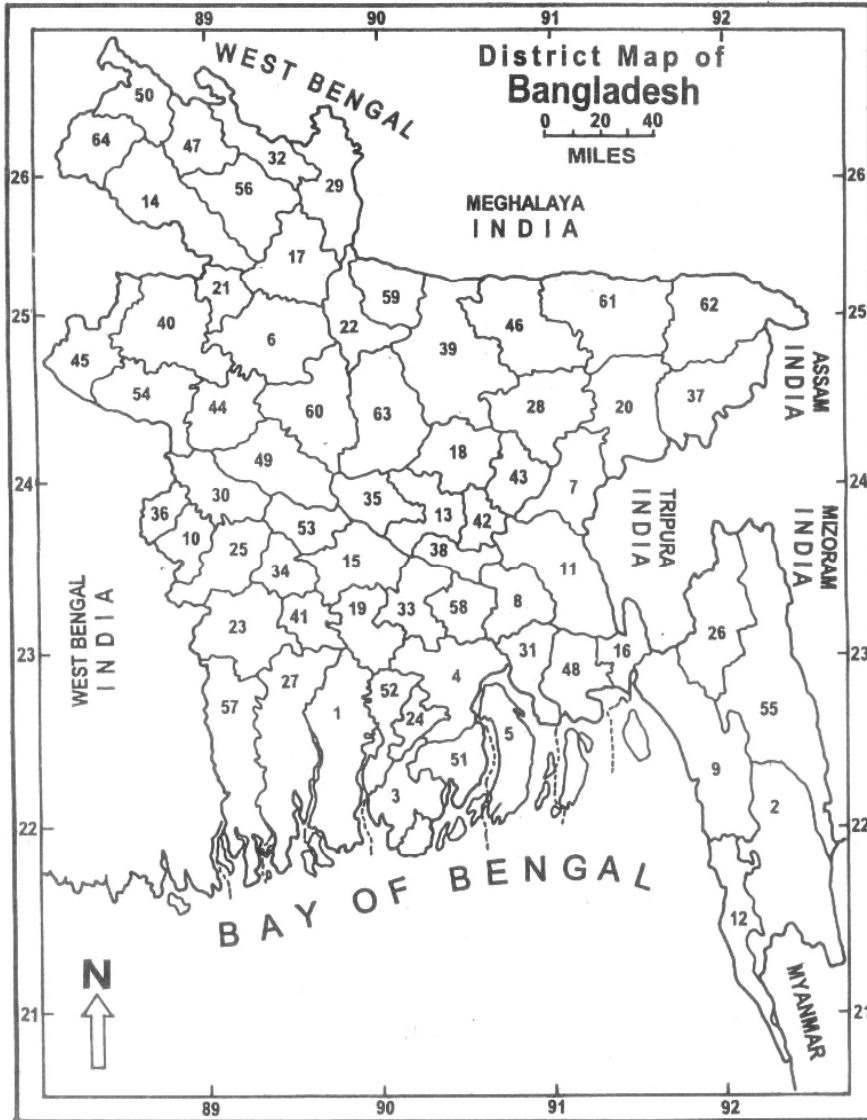
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List of Districts

The serial numbers correspond to those given in the map.

1.	Bagerhat	33.	Madaripur
2.	Bandarban	34.	Magura
3.	Barguna	35.	Manikganj
4.	Barishal	36.	Meherpur
5.	Bhola	37.	Maulvi Bazar
6.	Bogura	38.	Munshiganj
7.	Brahamanbaria	39.	Mymensingh
8.	Chandpur	40.	Naogaon
9.	Chattogram	41.	Narail
10.	Chuadanga	42.	Narayanganj
11.	Cumilla	43.	Narsingdi
12.	Cox's Bazar	44.	Natore
13.	Dhaka	45.	Nawabganj
14.	Dinajpur	46.	Netrakona
15.	Faridpur	47.	Nilphamari
16.	Feni	48.	Noakhali
17.	Gaibandha	49.	Pabna
18.	Gazipur	50.	Panchagarh
19.	Gopalganj	51.	Patuakhali
20.	Habiganj	52.	Pirojpur
21.	Jaipurhat	53.	Rajbari
22.	Jamalpur	54.	Rajshahi
23.	Jashore	55.	Rangamati
24.	Jhalakati	56.	Rangpur
25.	Jhenaidaha	57.	Satkhira
26.	Khagrachhari	58.	Shariatpur
27.	Khulna	59.	Sherpur
28.	Kishoreganj	60.	Sirajganj
29.	Kurigram	61.	Sunamganj
30.	Kushtia	62.	Sylhet
31.	Lakshmipur	63.	Tangail
32.	Lalmonirhat	64.	Thakurgaon

LIST OF FAMILIES PUBLISHED

	Fl. No.		Fl. No.		Fl. No.
Aizoaceae	34	Flagellariaceae	3	Plumbaginaceae	42
Annonaceae	52	Fumariaceae	3	Polemoniaceae	2
Asclepiadaceae	48	Gesneriaceae	65	Pontederiaceae	24
Averrhoaceae	18	Haloragaceae	8	Potamogetonaceae	40
Avicenniaceae	31	Hydrocharitaceae	28	Punicaceae	22
Basellaceae	2	Hydrocotylaceae	44	Rhamnaceae	61
Bixaceae	35	Hydrophyllaceae	1	Rhizophoraceae	7
Buddlejaceae	13	Juncaceae	29	Ruppiaceae	19
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Caricaceae	1	Malvaceae	54	Sphenocleaceae	5
Cassythaceae	43	Menispermaceae	51	Stemonaceae	41
Casuarinaceae	1	Menyanthaceae	49	Stylidiaceae	32
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Combretaceae	50	Moringaceae	2	Trapaceae	27
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Dipterocarpaceae	25	Periplocaceae	47		
Elatinaceae	39	Phytolaccaceae	1		

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GESNERIACEAE Dumort.

Sarder Nasir Uddin

Acaulescent or caulescent herbs, shrubs, occasionally epiphytes or rarely trees. Leaves simple, usually opposite, or rarely alternate or whorled or basal, rosette forming, those of a pair equal or unequal, plants sometimes with one leaf, entire or dentate, rarely shallowly to deeply lobed, pinnately or rarely palmately veined; exstipulate. Inflorescence usually axillary or terminal, simple or compound, dichasial cymes, rarely racemose, subcapitate or solitary flowers, bracts small or absent; usually pedunculate. Flowers large and showy, hermaphrodite, often protandrous, zygomorphic or rarely actinomorphic, sometimes cleistogamous with reduced corolla. Calyx (4 or) 5-lobed or divided to the base. Corolla 5-(rarely 4) merous, gamopetalous, with a distinct tube, limb often 2-lipped, lobes imbricate, adaxial pair usually interior. Stamens 2 or 4, rarely 5, inserted on the corolla tube, anthers free or coherent, thecae 2, parallel, divergent, or divaricate, staminodes 1-3 or absent. Disk annular or cupular, rarely absent. Ovary superior, 1-celled with 2 parietal bilamellate placentae, usually inrolled, styles simple, stigmas simple or variously lobed, ovules numerous, anatropous. Fruits often a linear capsule, splitting loculicidally, valves straight or twisted, rarely a berry, indehiscent. Seeds numerous, fusiform to ellipsoid or ovoid, minute, sometimes hair-like appendages at either end, with or without endosperm; embryo straight, cotyledons equal or unequal after germination.

A family of over 3000 species belonging to 133 genera, mainly pantropical in distribution with only a few species in temperate region (Wang *et al.*, 1998). In Bangladesh, the family is represented by 11 genera and 28 species.

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Abbreviations used in the text

- ASSAM = Eastern Regional Centre, Shillong
- BFRI = Bangladesh Forest Research Institute Herbarium
- CAL = Central National Herbarium, Kolkata
- DACB = Bangladesh National Herbarium
- DUSH = Dhaka University Salar Khan Herbarium
- K = The Royal Botanic Gardens Kew Herbarium

KEY TO THE GENERA

- | | |
|--|----------------------|
| 1. Fruits indehiscent berries, fleshy to leathery | Rhynchotechum |
| + Fruits dehiscent capsules | 2 |
| 2. Plants from tubers | Chrysothemis |
| + Plants without tubers | 3 |
| 3. Leaves of a pair strongly different in size (anisophyllous); calyx plicate between lobes; corolla tube campanulate, spurred or saccate at base; stamens 4; ovary depressed globose or subglobose | Stauranthera |
| + Leaves of a pair subequal or leaves alternate; calyx not plicate; corolla tube funnelform to tubular, base usually not swollen, rarely saccate, sometimes gibbous abaxially; stamens (1 or) 2 or 4; ovary linear to oblong | 4 |

- | | | |
|-----|---|-----------------------|
| 4. | Capsule shorter than calyx; ovary ovoid to depressed globose | 5 |
| + | Capsule much surpassing calyx; ovary usually linear to oblong, rarely ellipsoid | 6 |
| 5. | Stem leaves 1 to few, alternate; inflorescences sympodial or scorpioid, racemose; | Rhynchoglossum |
| + | Stem leaves many, opposite; flowers axillary, solitary or rarely 2 flowered; | Achimenes |
| 6. | Fertile stamens 4 | 7 |
| + | Fertile stamens 2 | 8 |
| 7. | Seeds with subulate or hairlike appendage at both end; corolla tube narrowly tubular to funnellform-tubular or subtubular, longer than limb; ovary linear; stamens adnate to corolla tube near or above middle, anthers usually coherent in pairs | Aeschynanthus |
| + | Seeds without hairlike appendage; corolla tube campanulate, shorter than to slightly longer than limb; ovary ovoid, ellipsoid, or conical; stamens adnate to corolla near or slightly above base, anthers free or all 4 coherent together | Boeica |
| 8. | Capsule valves spirally twisted or seldom straight, if straight leaf blade abaxially woolly, pannose, or velutinous, hairs dense, interwoven, usually branched | Paraboea |
| + | Capsule valves straight, not twisted; leaf blade abaxially strigose or puberulent to villous, velutinous, or woolly | 9 |
| 9. | Leaves in a 4-merous whorl on top of stem; flowers crowded in a terminal bunch, almost sessile; capsules linear or elongate-lanceolate, valves 2 straight not 4-valved | Tetraphyllum |
| + | Leaves placed along stem; flowers with distinct pedicels; capsules narrowly lanceolate, valves 2 straight soon again bipartite (capsule usually subequally 4-valved). | 10 |
| 10. | Stigma abaxial, shortly bifid | Henkalia |
| + | Stigma terminal, undivided | Didymocarpus |

Achimenes Vahl

Symb. Bot. 2: 71. 1791.

Type species: *A. sesamoides* Vahl.

Perennial, terrestrial, pubescent or glabrous herbs from scaly rhizomes. Stems simple. Leaves opposite or ternate, petiolate; lamina subequal or unequal, thin, dentate or serrate. Inflorescence axillary; pedicels solitary or geminate or 1-several on a common peduncle. Calyx tube turbinate, adherent to the ovary, lobes 5, entire. Corolla usually salverform, funnellform, sometimes campanulate; tube erect or oblique in calyx, often saccate or calcarate at base; limb regular or bi-labiate, lobes 5, broad. Stamens 4, didynamous, filaments insert near the base of the corolla tube, anthers united to form a square, thecae distinct; a small staminode often present. Disc annular, often cuplike, usually entire, rarely divided and appearing lobate, glabrous. Ovary half or almost wholly inferior, style elongated, stigma stomatomorphic or distinctly bi-lobate. Fruits capsular, convex or short-conic at apex, bi-valvate. Seed small, numerous.

Achimenes longiflora DC., Prodr. 7(2): 536. 1839. *Achimenes jaureguia* Warsz. ex Haage, Fl. Serres Jard. Eur. 5: t. 536. 1849. *Achimenes kleei* Paxton, Paxton's Mag. Bot. 16: 289. 1849. *Achimenes margarita* Siebert & Voss, Vilm. Blumengärtn. ed. 31: 791. 1894. *Achimenes pauciflora* Oerst., Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd. V, 5: 91. 1861. *Achimenes tyrianthina* Voss, Vilm. Blumengärtn. ed. 31: 792. 1894. *Gesneria longiflora* Moc. & Sessé ex DC., Prodr. 7: 536. 1839. *Trevirana longiflora* (DC.) D.Dietr., Syn. Pl. 3: 568. 1842. **Fig. 1.**

English: Cupid's Bower, Magic Flower, Monkey-Faced Pansy, Orchid Pansy.

Perennial, rhizomatous herbs, 10-30 cm tall. Stem terete, green to reddish brown, white pilose. Leaves simple, opposite or ternate, short-petiolate (6 mm), the blades ovate to lanceolate, 2-8 × 1.3-3.0 cm, apex acute, base cuneate, slightly unequal, margins dentate-serrate, pilose throughout, green above, purple beneath; petioles 0.1-0.5 cm long. Flowers axillary, solitary or rarely 2 flowered; common peduncle absent, the pedicel solitary, 4-7 mm long. Sepals 5, free, lanceolate, 1.0-1.4 cm long, acuminate, pilose, hairs denser towards base. calyx tube 2-3 mm long. Corolla actinomorphic, purplish-violet to pinkish-purple, tube 3.0-4.5 cm long, lobes 5, unequally spreading, 6-8 cm broad, obtuse. Stamens 5, epipetalous, 2.0-4.5 cm long, filaments filiform; anthers

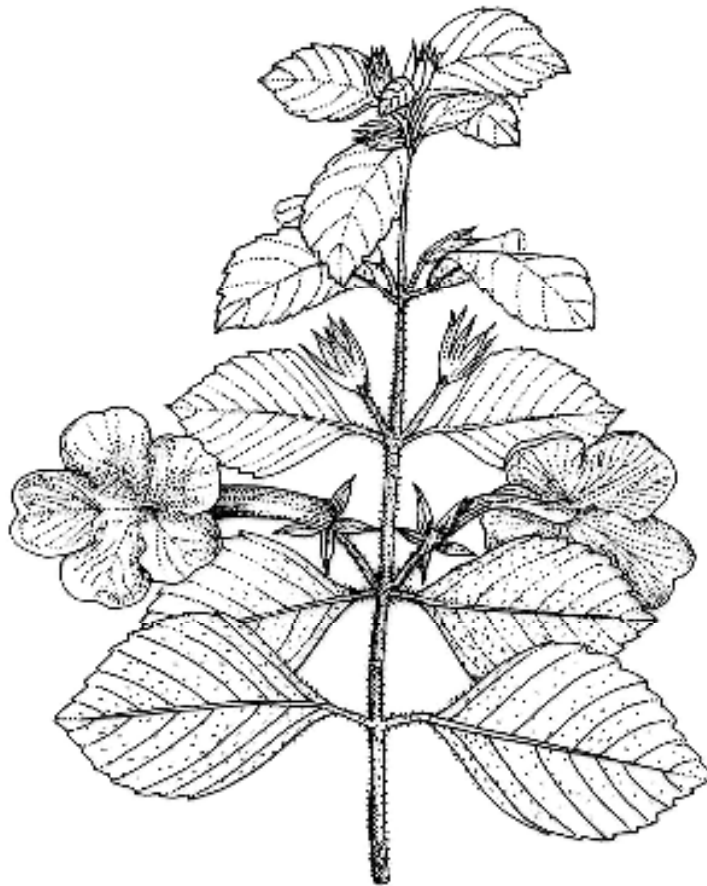


Figure 1. *Achimenes longiflora* DC., flowering shoot.

notched, 2-celled, opening by apical slits. Carpels 2, united; style 3.0-4.3 cm long, hirsute; stigmatic lobes 2, ovary 2-celled. Fruit a globose capsule, 2-4 mm diameter. Seeds many, rugose. *Fl. & Fr.*: 6-10. *Grows on stones, walls or sometimes on sandy soils.*

Dhaka: Fular Road, Dhaka University Campus, 7 i 1981, Mofiz *s.n.* (DACB).

Guatemala, Mexico, Bolivia and also introduced in India.

The plant was introduced in the garden of Dhaka.

Aeschynanthus Jack

Trans. Linnean Soc. London 14: 42. 1823.

Type species: *A. volubilis* Jack

Epiphytic or lithophytic shrubs or climbers. Stems often pendent, branched or unbranched. Leaves usually many, opposite, rarely in whorls of 3-4, fleshy or leathery, equal to subequal in a pair; leaf-blades glabrous, rarely pubescent, base cuneate to rounded or attenuate, entire or dentate, veins obscure. Inflorescence axillary, pseudoterminal or terminal, lax or sometimes dense, 1-10 flowered, dichasial or clustered, umbellate cymes, bracts 2, opposite, caducous. Calyx actinomorphic, tubular or campanulate, shallowly to deeply 5-lobed, segments equal, rarely unequal. Corolla red to orange, seldom greenish, yellow, or white, zygomorphic, tubular-funneliform, showy, curved, 0.4-1.5 cm in diameter, inside sparsely glandular puberulent, glabrous, or with a hair ring; limb 2-lipped, upper lobes erect, 2-lobed; usually equalling, occasionally to half length of abaxial lip, lower ones larger and reflexed, 3-lobed, lobes equal or subequal, apex rounded to acute. Stamens 4, didynamous, exserted; anthers basifixed, usually coherent in pairs at apex, thecae parallel, dehiscing longitudinally; connective not projecting; staminode 1 or absent, adnate to adaxial side of corolla tube. Disk cupular or annular. Ovary unilocular, stipitate, oblong or linear, styles slender, stigmas capitate; placentas 2, parietal. Capsules long linear, cylindrical, 2-valved, loculicidally dehiscent, valves 2 or 4, straight. Seeds minute, ellipsoid, rugose or papillate, with 1 or more hairlike appendages, one at the apex.

KEY TO THE SPECIES

- | | |
|---|-----------------------|
| 1. Corolla inside with 5 tufts of hairs above base; seeds with 20-25 hairlike appendages at hilar end | A. longicaulis |
| + Corolla inside glabrous to pubescent, without tufts of hairs; seeds with 1 or 2 hairlike appendages at hilar end | 2 |
| 2. Calyx (3-) 5-lobed, tube at least 2 mm long | 3 |
| + Calyx 5-lobed, without tube | 6 |
| 3. Corolla 2-3 cm long; calyx red-purple or tinged red-purple | 4 |
| + Corolla 4-6 cm long; calyx green | A. parasiticus |
| 4. Leaf blade 2.5-4.0 cm wide, base broadly cuneate, apex acuminate; bracts 5-9 mm long | A. hookeri |
| + Leaf blade 1.0-2.4 cm wide, base attenuate, apex caudate or caudate-acuminate; bracts up to 3 mm long | 5 |
| 5. Corolla tube less than 4 cm long | A. parviflorus |
| + Corolla tube more than 4 cm long | A. radicans |
| 6. Leaf blade 10-20 × 5-10 cm; cymes 5-15-flowered; bracts persistent, 4.0-5.5 cm long; calyx segments 2-3 cm long; corolla 5.5-8.5 cm; capsules 30-50 cm long | 7 |
| + Leaf blade 1.5-12 × 0.5-6.0 cm; cymes 1-7-flowered; bracts deciduous or persistent, 0.2-3.0 cm long; calyx segments 0.2-1.8 cm; corolla 1.5-4.2 cm; capsules 3-29 cm long | 8 |
| 7. Inflorescence up to 6 mm long; bracts linear | A. longiflorus |
| + Inflorescence 38-60 mm long; bracts ovate or elliptic | A. superbus |
| 8. Bracts persistent, ovate to suborbicular; calyx segments ovate to ovate-oblong | A. acuminatus |
| + Bracts persistent or deciduous, linear to ovate; calyx segments linear to lanceolate, elliptic, or subulate | 9 |
| 9. Bracts persistent, 10-30 mm long, red to purple; calyx red, 11-20 mm long | A. bracteatus |
| + Bracts deciduous, 2-13 mm long, green; calyx green, sometimes tinged reddish or reddish, 3-10 mm long | A. micranthus |

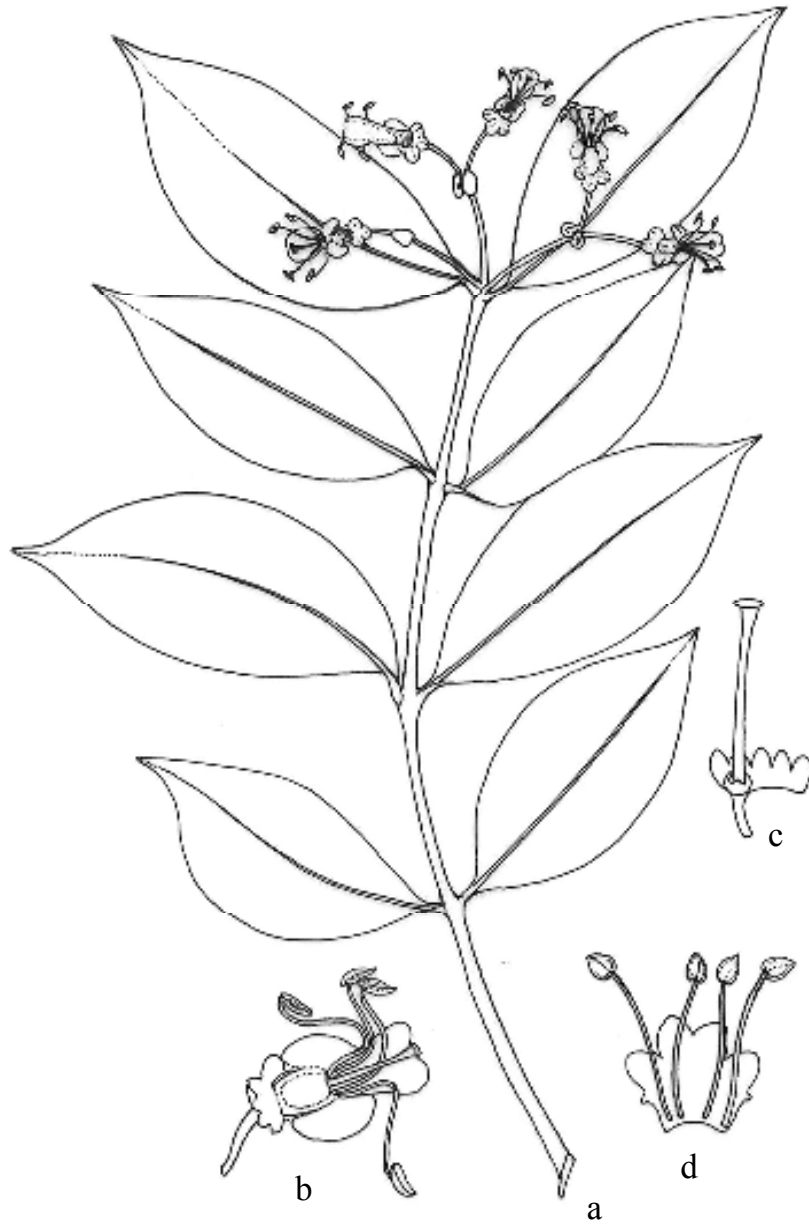


Figure 2. *Aeschynanthus acuminatus* Wall. ex A. DC., a) flowering shoot; b) flower; c) opened calyx with pistil; and d) opened corolla with stamens.

Aeschynanthus acuminatus Wall. ex A. DC., Prodr. 9: 263. 1845. C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 45. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 4: 341. 1884; Cowan & Cowan, Tree North Beng.: 96. 1929; Kanjilal *et al.*, Fl. Assam 3: 391. 1939 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982; Wang *et al.*, Fl. China 18: 377. 1998; Hilliard, Fl. Bhutan 2(3): 1300. 2001; Burt, Thai Forest Bull. (Bot.) 29: 83. 2001; Kress *et al.*, Checkl. Myanmar 261. 2003. *Aeschynanthus chinensis* Gardner & Champ., Hooker's J. Bot. Kew Gard. Misc. 1: 328. 1849. *Aeschynanthus bracteatus* Benth., Fl. Hongk. 258. 1861. *Aeschynanthus acuminatus* var. *chinensis* (Gardner & Champ.) C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 31. 1883. *Trichosporum acuminatum* Kuntze, Revis. Gen. Pl. 2: 477. 1891. *Trichosporum acuminatum* Matsum., Index Pl. Jap. 2(2): 578. 1912. **Fig. 2.**

Creeping or pendent epiphytes, sometimes lithophytes. Stems 25-150 cm long, glabrous. Leaves opposite; petiole 2-10 mm long, glabrous; leaf blade lanceolate to elliptic or narrowly oblanceolate, rarely obovate, 3.5-12.0 × 1.4-6.5 cm, base cuneate to obtuse, apex acuminate, margins entire to shallowly crenulate, thin papery to leathery, glabrous, adaxially drying smooth, abaxially sparsely punctate, 4-8 pairs of secondary veins, tertiary veins indistinct. Inflorescences axillary or terminal, 2-5-flowered cymes; peduncle 0.8-4.0 cm long; bracts persistent, reddish, ovate to orbicular, 3-10 × 2-20 mm; pedicel 7-12 mm, glabrous. Calyx green or green with purple tips, 5-sect from base, segments ovate to ovate-oblong, spreading to recurved, 2.5-4.5 × 2-3 mm, outside glabrous. Corolla 1.5-2.5 cm long, tube broad at base, mouth strongly oblique and consequently large, externally tube green, yellowish-green, or green with faint brown lines, lobes brown, greenish-yellow or green tinged with brown-red, internally paler; limb distinctly 2-lipped, upper lobes oblong or ovate, slightly spreading, 4.5-7.5 × 3.2-6.0 mm, sinus 3-5 mm deep, apex rounded; lateral lobes ovate or deltoid, reflexed, 5-8 × 6.0-8.5 mm, apex rounded or obtuse; lower lobe oblong or elliptic, reflexed, 5-9 × 3-6 mm, apex rounded, outside glabrous except for ciliate lobes, inside with sparse glandular hairs throughout including on base of lobes and in throat, with sessile glands running down tube under lower 3 lobes. Stamens exserted, fused in 2 pairs; filaments 1.5-2.5 cm long, various shades of purple or red, glabrous or with few sessile glands; anthers coherent in pairs at apex, 3.0-3.5 × 1.5-2.0 mm, purple; staminode 1.2-3.5 mm long; pollen green. Disk 1.5-2.2 mm high, 5-crenate. Pistil 1.5-2.4 cm long, stipe 2-7 mm long, glabrous; ovary green, 9-22 mm long, glabrous. Style pink or green, 4-7 mm long,

glabrous. Capsules 10-20 cm × 2-3 mm. Seeds 1.0-1.5 × 0.2 mm, smooth, with 1 hair like appendage at each end, appendages 3.0-3.5 mm long. $2n = 32$ (Kokubugata and Yokota, 2017). *Fl. & Fr.*: 10-5. *Grows on trees or streamside rocks in evergreen forests; 100-1000 m altitudes.*

East Bengal: locality & date unknown, W.Griffith, 3806 (CAL 331192). **Sylhet:** locality & date (1832) unknown, N.Wallich, 6397 (K-000831876).

Bhutan, India, Nepal, Myanmar, Thailand, Laos, Vietnam, Taiwan, China and Malaysia.

Plant has potential horticultural value.

Aeschynanthus bracteatus Wall. *ex* A. DC., Prodr. 9: 261. 1845. C.B. Clarke in Hook.f., Fl. Brit. India 4: 342. 1884; Cowan & Cowan, Tree North Beng.: 96. 1929; Kanjilal *et al.*, Fl. Assam 3: 391. 1939 (reprint 1982). *Aeschynanthus paxtonii* Lindl., J. Hort. Soc. London 4: 79. 1849. *Aeschynanthus peelii* Hook.f. & Thoms., Ill. Himal. Pl. t. 17. 1855. *Aeschynanthus bracteatus* var. *peelii* (Hook.f. & Thoms.) C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 44. 1874. *Trichosporum bracteatum* Kuntze, Revis. Gen. Pl. 2: 477. 1891. **Fig. 3.**

Stems 25-150 cm long, glabrous. Leaves opposite; petiole 5-20 mm long; leaf blade broadly lanceolate to elliptic, ovate, or obovate, 4-12 × 1.5-6.0 cm, base cuneate to rounded or subcordate, apex caudate to acuminate, margin entire to shallowly dentate, frequently undulate, sometimes revolute, leathery to papery, glabrous, upper surface drying wrinkled or smooth, lower surface few punctate, lateral veins indistinct. Cymes axillary or pseudoterminal, 2-7-flowered; peduncle 2-7 cm long; bracts usually persistent, red to purple, lanceolate to ovate, 1.5-3.0 × 0.5-1.5 cm. Pedicel 6-12(-20) mm long, glabrous. Calyx red, 5-sect from base; segments linear to lanceolate, 10-20 × 2-4 mm, outside glabrous. Corolla red to pink or purple, 3.2-4.2 cm long, glabrous, mouth strongly oblique; limb indistinctly 2-lipped; adaxial lip erect, 6-8 mm wide; abaxial lip reflexed, 6-8 mm wide. Stamens exserted; filaments 2.2-2.5 cm long; anthers coherent in pairs at apex, 1.8-2.5 mm long; staminode ca. 0.5 mm long. Pistil 2.5-3.0 cm long; ovary glandular puberulent; style 4-6 mm long, glandular puberulent. Capsule 7-15(-20) cm long. Seeds with 1 hairlike appendage at each end, appendages 1.8-3.0 mm long.



Figure 3. *Aeschynanthus bracteatus* Wall. ex A. DC., a) flowering shoot; b) opened flower; c) pistil; d) capsule; and e) seed.

$2n = 18$ (Yuanxue *et al.*, 2002) *Fl. & Fr.*: 6-1. *Grows on streamside cliffs and trees in hilly forests; between 500-800 m altitudes.*

East Bengal: locality & date unknown, W.Griffith, 3807 (CAL 331246). **Sylhet:** locality & date unknown, F. De Silva, 794 (K-001111907).

Bhutan, India, Myanmar and China.

Plant has potential horticultural value.

Aeschynanthus hookeri C.B. Clarke, Monogr. Phan. 5: 21. 1883. C.B. Clarke in Hook.f., Fl. Brit. India 4: 338. 1884; Cowan & Cowan, Tree North Beng.: 96. 1929; Kanjilal *et al.*, Fl. Assam 3: 388. 1939 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 237. 2009. *Aeschynanthus parasiticus* C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 49. 1874; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982. *Trichosporum hookeri* Kuntze, Revis. Gen. Pl. 2: 477. 1891. **Fig. 4.**

Epiphytic shrubs, laxly branched. Stem up to 1 m long, slender, glabrous, pendent, rooting mainly at lower nodes. Leaves simple, opposite, fleshy; leaf blades narrowly elliptic to oblong, $6-11 \times 1.5-4.0$ cm, apex acuminate, base cuneate, margin entire, adaxially drying smooth or wrinkled, abaxially not punctate, lateral veins indistinct; petioles 7-13 mm long. Inflorescence pseudoterminal cymes, 4-10-flowered; peduncle absent; bracts persistent, green, triangular to lanceolate, $5-9 \times 1.5-3.0$ mm; pedicel 1.0-1.5 cm long, glabrous. Calyx tube 8-14 mm long, 5-lobed from above to near middle, lobes mostly one-third length of the tube, 3-6 mm long, ovate to broadly triangular, $3-7 \times 2-3$ mm, outside glabrous obtuse, red or purple. Corolla glandular, pubescent outside, inside glabrous, 3-4 cm long, tube curved near the apex, inflated, limb indistinctly 2-lipped, lips nearly equal, ca. 4.5 mm long, all 5 lobes projecting forwards, mouth almost round and slightly oblique, throat yellow, rest of corolla bright scarlet or orange scarlet, each lobe with a conspicuous dark purplish median line running back halfway down the tube. Stamens far-exserted, anticus filaments glandular-puberulous; filaments 2.6-3.0 cm long; anthers coherent in pairs at apex, 2.5-3.0 mm long; staminode ca. 1 mm long. Pistil ca. 3 cm long; ovary glabrous; style ca. 1.2 cm long, puberulent. Fruits about 30 cm long. Seeds about 1 mm long, with two long delicate hairlike appendages at hilar end,



Figure 4. *Aeschynanthus hookeri* C.B. Clarke, a) flowering shoot; and b) capsule.

to 13 mm long, opposite end with 1 hairlike appendage to 7 mm long. *Fl. & Fr.*: 5-10. *Evergreen forests on trees; between 500-1000 m altitudes.*

Kanjilal *et al.* (1939) reported this species Jaintiapur in Sylhet district but since then no other specimen has been collected from the area.

India, Bhutan, Nepal, Myanmar and China.

Plant has potential horticultural value.

Aeschynanthus longicaulis Wall. *ex R. Br.*, *Pl. Jav. Rar.* 116. 1848. *Aeschynanthus marmoratus* T. Moore, *Paxton's Fl. Gard.* 3: 56. 1852. *Aeschynanthus zebrinus* Lem., *Hortus Van Houtteanus* 1(2): 42. 1846. *Trichosporum longicaule* Kuntze, *Revis. Gen. Pl.* 2: 478. 1891. **Fig. 5.**

English: Tiger Striped Lipstick, Zebra Lipstick, Zebra Basketvine

Epiphytic, pendulous herbs. Stems up to 45 cm long, glabrous. Leaves opposite; sessile or shortly petiolate; leaf blade elliptic to lanceolate or oblanceolate, 6-12 × 2.0-3.5 cm, base cuneate, apex acuminate, margin undulate-crenulate, papery to leathery, glabrous, adaxially drying wrinkled, abaxially sparsely punctate, lateral veins indistinct. Inflorescence axillary cymes, 1-3-flowered; peduncle absent; bracts deciduous. Pedicel 0.5-1.7 cm, glabrous. Calyx green, 5-lobed from base; lobes linear-lanceolate, 8-15 × 1-2 mm, outside glabrous. Corolla yellow-green, 1.4-2.0 cm long, outside glabrous, inside with 5 tufts of hairs below middle, mouth not oblique; limb indistinctly 2-lipped, lips nearly equal, 2-4 mm long. Stamens exserted; filaments 1.2-1.6 cm long; anthers coherent in pairs at apex, 2.0-2.5 mm long. Pistil 3.2-3.6 cm long; ovary glabrous; style 1.8-2.2 cm long, sparsely puberulent. Capsule 15-35 cm long. Seeds with 20-25 hair-like appendages at hilar end, appendages 1-2 cm long. $2n = 28, 30$. *Fl. & Fr.*: 10-2. *Grows on tree trunks in forests; 500-800 m altitudes.*

Dhaka: Pollobi, Mirpur, 1 ix 2017, *Mahbuba Sultana*, 2014 (DACB).

Myanmar, Thailand, Vietnam, China and Malaysia.

This introduced species have ornamental value.

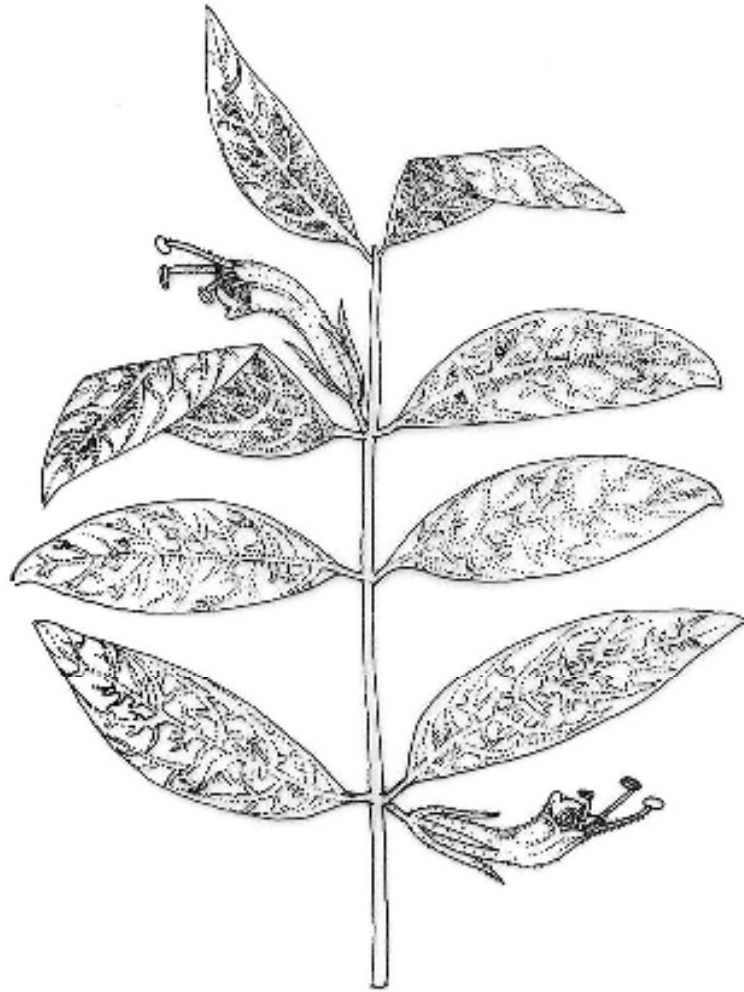


Figure 5. *Aeschynanthus longicaulis* Wall. ex R. Br., flowering shoot.

Aeschynanthus longiflorus (Blume) A. DC., Prodr. 9: 262. 1845. Hooker, Bot. Mag. 73: t. 4328. 1847; Ridley, J. Asiat. Soc. Bengal 74(2): 734. 1909; Burt, Thai Forest Bull. (Bot.) 29: 83. 2001. *Lysionotus longiflorus* Blume, Bijdr. 766. 1826. *Trichosporum longiflorum* (Blume) Kuntze, Revis. Gen. Pl. 478. 1891. *Aeschynanthus perakensis* Ridl., J. Linnean Soc. Bot. 32: 499. 1896; Ridley, J. Asiat. Soc. Bengal 74(2): 734. 1909. **Fig. 6.**

English: Lipstick Plant

Epiphytes with arching stems, glabrous. Leaves opposite; petiole 5-15 mm long, glabrous; blade ovate or elliptic, 3.5-17.5 × 1.5-6.5 cm, base rounded to cuneate, apex acuminate to caudate, margin entire, fleshy or coriaceous, dark green above, pale green beneath, glabrous, secondary veins 3-8 pairs, obscurely visible. Inflorescences terminal, 2-5-flowered cymes; peduncle absent; bracts linear, 3-6 mm long; pedicels 10-15 mm long, brownish-green or purplish, glabrous. Calyx of separate lobes free to base, unequal, green to dark red or purplish, glabrous or sparsely hairy, sometimes ciliate at margins, 5-20 mm long; lobes linear, narrowly triangular, narrowly ovate or oblong, erect, 5-20 × 1-2 mm, apex obtuse to acuminate. Corolla 4-9 cm long, tube narrow at base; externally bright red or dark red, internally tube cream-coloured, lobes bright red; upper lobes orbicular, oblong or ovate, 3-8 × 3-5 mm, sinus 3-6 mm deep, apex rounded; lateral lobes oblique ovate or deltoid, 3.2-7.5 × 5.5-9.0 mm, apex rounded; lower lobe ovate, not spreading or reflexed, 6-12 × 4-6 mm, apex rounded; outside glabrous to sparsely glandular puberulent, usually with ciliate lobes, sparsely glandular hairs inside. Stamens long exserted, fused in 2 pairs; filaments reddish, purple or pink, pubescent, anthers pale pink; anterior filaments inserted at 5-6 cm from corolla base, filaments 3-5 cm long, anthers 3.5-5.0 × 1-2 mm; posterior filaments inserted at 5-6 cm from corolla base, filaments 2-4 cm long, anthers 2.4-3.6 × 1-2 mm; staminode 1-5 mm long. Disk 1.0-1.5 mm high, 5-crenate. Pistil 4-8 cm long; stipe 1.5-2.0 mm long, glabrous to sparsely minutely papillose; ovary 2-3 mm long, minutely papillose puberulent; style purple or purplish-pink, 1.5-3.5 mm long, glandular pubescent to papillose. Capsule 20-60 cm × 3-4 mm. Seed grain 1.5-1.8 × 0.3-0.4 mm, warty, apical appendage a filiform hair, 1.5-2.5 mm long; hilar appendage a single filiform hair, 1.5-2.5 cm long; appendages papillose. $2n = 30$ (Fedorov, 1969). *Fl. & Fr.*: 5-10. *In primary evergreen, hilly forests, or in disturbed forests; between 200-1000 m altitude.*



Figure 6. *Aeschynanthus longiflorus* (Blume) A. DC., flowering shoot.

East Bengal: locality & date unknown, W.Griffith, 3808 (CAL 331306). **Sylhet:** Pundua, Sylhet, date unknown (1824), F. De Silva, 795 (K-001111909 & K-001111910).

Thailand, Malaysia and Indonesia.

Plant has potential horticultural value.

Aeschynanthus micranthus C.B. Clarke, Monogr. Phan. 5: 27. 1883. C.B. Clarke in Hook.f., Fl. Brit. India 4: 340. 1884; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 238. 2009. *Aeschynanthus parviflorus* C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 7. 1874. *Aeschynanthus austroyunnanensis* W.T. Wang, Acta Phytotax. Sin. 13(2): 63. 1975. *Aeschynanthus austroyunnanensis* var. *guangxiensis* (Chun) W.T. Wang, Fl. Reipubl. Popul. Sin. 69: 513. 1990. *Aeschynanthus guangxiensis* Chun *ex* W.T.Wang & K.Y.Pan, Bull. Bot. Res., Harbin 2(2): 146. 1982. *Trichosporum micranthum* (C.B. Clarke) Kuntze, Revis. Gen. Pl. 2: 478. 1891. **Fig. 7.**

Local names: Sundari-lata, Pargacha-lata.

Laxly branched undershrubs. Stems up to 1 m long, often rooting at the nodes, glabrous or with a few hairs at the node. Leaves opposite; petiole 3-8 mm long; leaf blade elliptic to broadly elliptic, ovate, or obovate, 2.2-7.0 × 1.5-4.0 cm, base cuneate to rounded, apex acute to rounded or acuminate, margin entire, thin leathery to papery, glabrous, adaxially drying wrinkled, abaxially not punctate, lateral veins indistinct to somewhat distinct. Inflorescence axillary cymes, 1 or 2-flowered; peduncle absent; bracts deciduous, linear-lanceolate, 1.5-3.0 mm long, hairy; pedicel 4-8 mm long, sparsely puberulent. Calyx green, 5-sect from base; segments linear-lanceolate, 4-5 × 0.8-1.2 mm, outside puberulent to glabrous. Corolla red, 2.4-2.7 cm long, outside puberulent to glabrous, inside glabrous, mouth not oblique; limb indistinctly 2-lipped; adaxial lip ca. 5 mm wide; abaxial lip ca. 7 mm wide. Stamens exserted; filaments 1.0-1.5 cm long; anthers coherent in pairs at apex, 1.2-1.5 mm long; staminode ca. 0.8 mm long. Pistil 2.8-3.2 cm long; ovary glabrous; style ca. 1 cm long, sparsely puberulent. Capsule 10-25 cm long. Seeds with 1 hairlike appendage at each end, appendages 0.9-1.5 cm long. *Fl. & Fr.:* 10-12. *On riverside rocks, trees, and cliffs in hilly forests; between 400-700 m altitudes.*

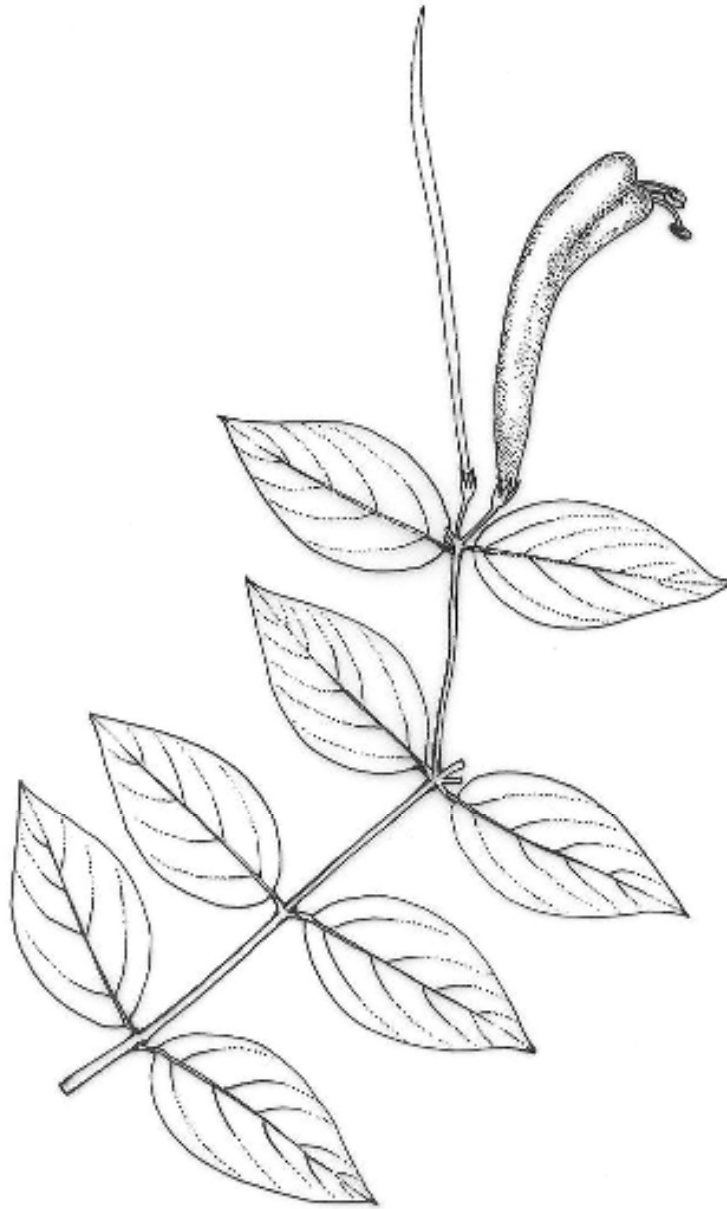


Figure 7. *Aeschynanthus micranthus* C.B. Clarke, flowering & fruiting shoot.

Dhaka: Baldha Garden, 25 x 2011, Mokarrom Hossain 2 (DACB).

Bhutan, Nepal, Myanmar and China.

Horticulturally attractive. Roots are used for curing rheumatism.

Aeschynanthus parasiticus (Roxb.) Wall., Numer. List 796. 1829. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 239. 2009. *Aeschynanthus andamanensis* Goel, M.K.V. Rao & Mehrotra, Bull. Bot. Surv. India 31: 154. 1992. *Aeschynanthus deleiensis* C.E.C. Fisch., Bull. Misc. Inform. Kew 1935: 320. 1935; Kanjilal *et al.*, Fl. Assam 3: 392. 1939 (reprint 1982). *Aeschynanthus grandiflorus* (D.Don) Spreng., Syst. Veg. 4(2): 238. 1827; C.B. Clarke in Hook.f., Fl. Brit. India 4: 338. 1884. *Aeschynanthus grandiflorus* var. *parasiticus* (Roxb.) C.B. Clarke, Monogr. Phan. 5: 22. 1883. *Aeschynanthus macranthus* (Merr.) Pellegr., Bull. Soc. Bot. France 73: 413. 1926. *Aeschynanthus mimetes* B.L. Burtt, Bot. Mag. 162: t. 9595. 1940. *Aeschynanthus pachytrichus* W.T. Wang, Acta Bot. Yunnan. 6: 24. 1984. *Incarvillea parasitica* Roxb., Pl. Corom. 3: 88. 1820. *Trichosporum grandiflorum* D.Don, Edinburgh Philos. J. 7: 85. 1822. *Trichosporum macranthum* Merr., Univ. Calif. Publ. Bot. 13: 141. 1926. **Fig. 8.**

English: Large-Flower Blushwort.

Epiphytic shrubs, laxly branched. Stem over 40 cm, glabrous, slender, rooting at nodes. Leaves opposite, leathery; leaf blade narrowly lanceolate to lanceolate, elliptic, 8-15 × 1.5-3.0 cm, apex attenuate to acuminate, base cuneate to broadly cuneate, margin entire to indistinctly denticulate, lateral veins indistinct, glabrous, adaxially drying smooth, abaxially not punctate; petioles 7-12 mm long. Inflorescence pseudoterminal cymes, later lanceolate, 3 × 1 mm; pedicels 10-15 mm long, glabrous. Calyx tube 8-15 mm long, 6.5-8 mm in diameter at mouth, shallowly 5-lobed; lobes triangular, 2-3 × 1.5-2.0 mm, acute, outside glabrous, green. Corolla 3-5 cm long, glandular, pubescent outside, inside with very coarse gland tipped hair, up to 2 mm long near the base of the tube, tube curved and overtopped by new growth, 4-8-flowered; peduncle absent, bracts deciduous, linear-lanceolate, 3 × 1 mm; pedicels 10-15 mm long, glabrous. Calyx tube 8-15 mm long, 6.5-8 mm in diameter at mouth, shallowly 5-lobed; lobes triangular, 2-3 × 1.5-2.0 mm, acute, outside glabrous, green. Corolla 3-5 cm long, glandular, pubescent outside, inside with



Figure 8. *Aeschynanthus parasiticus* (Roxb.) Wall., flowering shoot.

very coarse gland tipped hair, up to 2 mm long near the base of the tube, tube curved and inflated in upper half, slightly constricted at mouth, limb indistinctly 2-lipped, adaxial lip ca. 6 mm long, abaxial lip ca. 5.5 mm long; all 5 lobes projecting forwards, mouth nearly round, throat yellowish, rest of corolla orange-red or brick-red, dark purplish median patch on each lobe. Stamens far-exserted, filaments 2.3-3.2 cm long, glandular-puberulous; anthers coherent in pairs at apex, 1.2-2.0 mm long; staminode ca. 5 mm long. Disk annular. Pistil ca. 3 cm long; ovary glabrous or very minutely gland-dotted; styles ca. 1.8 cm long, glandular-puberulous. Fruit a capsule, about 30 cm long. Seeds about 1 mm long, with 2 long delicate hairs at one end, 1 at the other end. *Fl. & Fr.*: 4-9. $2n = 32$ (Kumar and Subramaniam, 1986). *On trees of evergreen forests; between 500-800 m altitudes.*

Sylhet: Jaintiapur, 9 x 1979, MS Khan & MMK Mia, K-5672 (DACB); 2 v 1981, MM. Huq *et al.* H 5139 (DACB); 3 x 1983, M.M. Huq *et al.* H-6323 (DACB); 5 x 1983, M.M.K. Mia & M.M. Rahman, M-933 (DACB); 1824, M.R. Smith, H.I. 796 (K-000096746); date unknown (1829!), N. Wallich, H.I. 796 (K-000096747, K-000096744 & K-000096745).

Bhutan, Nepal, Myanmar, Laos, Thailand, Vietnam and China.

Horticulturally attractive.

Aeschynanthus parviflorus (D. Don) Spreng., Syst. Veg. 4(2): 238. 1827. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982; Hilliard, Fl. Bhutan 2(3): 1303. 2001. *Trichosporum parviflorum* D. Don, Edinburgh Philos. J. 7: 85. 1822. *Aeschynanthus ramosissimus* Wall., Pl. Asiat. Rar. 1: 55. 1830; C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 50. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 4: 339. 1884; Cowan & Cowan, Tree North Beng.: 96. 1929. *Aeschynanthus maculatus* Lindl., Edwards's Bot. Reg. 27: t. 28. 1841; C.B. Clarke in Hooker, Fl. Brit. India 4: 339. 1884; Wang *et al.*, Fl. China 18: 384. 1998; Hilliard, Fl. Bhutan 2(3): 1303. 2001. *Trichosporum maculatum* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 478. 1891. *Aeschynanthus maculatus* var. *stenophyllus* C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 24. 1883. *Aeschynanthus maculatus* var. *sikkimensis* C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 24. 1883. *Aeschynanthus sikkimensis* (C.B. Clarke) Stapf, Bot. Mag. 148: t. 8938. 1922; Cowan & Cowan, Tree



Figure 9. *Aeschynanthus parviflorus* (D. Don) Spreng., flowering shoot.

North Beng.: 96. 1929; Kanjilal *et al.*, Fl. Assam 3: 392. 1939 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 133. 1982; Hilliard, Fl. Bhutan 2(3): 1303. 2001. *Aeschynanthus consobrinus* Kraenzl., Repert. Spec. Nov. Regni Veg. 24: 215. 1928. *Aeschynanthus hosseusii* auct. non Pellegr.: Barnett, Fl. Siam. 3(3): 200. 1962, *pro parte*. **Fig. 9.**

English: Sikkim Blushwort, Sprain Vine, Twisting Vine.

Epiphyte with ascending to pendulous stems, up to 40 cm long, glabrous. Leaves opposite; petiole 5-15 mm long, glabrous; leaf blades lanceolate to narrowly elliptic, 5-18 × 1-4 cm, base acute to cuneate, apex acuminate to caudate, margin entire or very weakly dentate, coriaceous to fleshy, glabrous, green, secondary veins 4-5, obscure. Inflorescences axillary or terminal, 2-6-flowered cymes; peduncle absent; bracts linear-lanceolate, 3-8 mm long; pedicels 5-15 mm long, purple or yellow-green, glabrous, sparsely minutely papillose or sparsely glandular puberulent. Calyx green or yellow-green, often flushed red or purple, glabrous; tube 2-6 mm long; 5-lobed from above middle, lobes narrowly triangular or triangular, erect, 2.2-8.5 × 1-3 mm, apex acute to acuminate. Corolla 2.5-3.0 cm long, tube quite narrow at base, tube orange to bright red outside with darker lines, limb indistinctly 2-lipped, lobes bright red to orange-red with darker lines; upper lobes squarish, orbicular or ovate, 2.0-4.5 × 2.2-5.0 mm, sinus 2-4 mm deep; lateral lobes oblong, ovate or deltoid, sometimes reflexed or spreading, 2.0-4.5 × 3.5-6.5 mm, apex obtuse or rounded; lower lobe orbicular, oblong or elliptic, 3.5-6.5 × 2.3-5.6 mm, apex rounded; outside sparsely to densely puberulent. Stamens exerted, fused in 2 pairs, filaments white at base and red or purple higher up, glabrous, anthers purple, grey-green, pollen pale yellow; filaments 1.5-3.0 cm long, anthers 2.0-3.5 × 1.0-1.5 mm; staminode 0.6-3.0 mm long. Disk 0.5-1.7 mm high, annular or 5-crenate. Pistil 3.5-4.5 cm long; stipe 5-10 mm long; ovary green, 1.5-2.2 mm long, glabrous, minutely papillose; style white, 1.2-2.5 mm long, glandular pubescent; stigma pink or purple, 1.3-2.5 mm across. Capsule 15-40 cm × 2.5-4.0 mm. Seed grain 0.7-1.2 × 0.2-0.5 mm, warty, appendages papillose; apical appendage one filiform hair, 1.0-3.5 cm long; hilar appendages two filiform hairs, 1.0-2.5 mm long. 2n = 32 (Fedorov, 1969). *Fl. & Fr.*: 5-10. *On trees in primary or degraded evergreen or scrub forests; between 650-1000 m altitudes.*

Chittagong: locality & date unknown (1867!), J.D. Hooker & T. Thomson, s.n. (K-000196665). **East Bengal:** locality & date unknown, W.Griffith, 3811 (CAL 331052).

India, Nepal, Bhutan, Myanmar, Thailand, Vietnam and China.

The plant can be used as an ornamental plant.

Aeschynanthus radicans Jack, Trans. Linn. Soc. London 14: 43. 1823; C.B. Clarke in Hooker, Fl. Brit. Ind. 4: 343. 1884; Ridley, J. Asiat. Soc. Bengal 74(2): 736. 1909; *Trichosporum radicans* (Jack) Nees, Flora 8. 1825. *Trichosporum ovatum* D. Don ex C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 41. 1883, *nom. illeg.* **Fig. 10.**

English: Basket Vine, Lipstick Plant

Epiphytic or lithophytic, creeping herbs. Stems puberulent or hairy. Leaves opposite; petiole 1-5 mm long, puberulent; blade ovate, orbicular or elliptic, 1-5 × 0.8-2.5 cm, apex rounded and apiculate or acute to acuminate, base subcordate to obtuse, margin entire, fleshy, glabrous to sparsely puberulent, secondary nerves obscure. Inflorescences axillary, usually 1-flowered; peduncle 0-3 mm long, bracts elliptic to ovate, 5-6 mm long; pedicels 7-15 mm long, puberulent. Calyx purple, puberulent, tube 13-20 mm long; lobes narrowly triangular, ovate or oblong, erect, 2-8 × 3-5 mm, apex rounded. Corolla 4.5-6.0 cm long, inflated at base, bright red outside, yellowish inside, upper lobes oblong or ovate, 6-10 × 2-4 mm, apex rounded, lateral lobes ovate or deltoid, 7-10 × 6-7 mm, apex rounded; lower lobe elliptic or oblong, 6-11 × 5.5-7.5 mm, apex rounded, outside densely puberulent, inside glabrous. Stamens slightly exserted, fused in 2 pairs, filaments 20-24 mm long, anthers 2.0-2.5 × 1.2-1.5 mm; staminode 0.5-5.0 mm long. Disk annular, 1-8 mm high. Pistil 4.5-6.0 cm long; stipe 18-27 mm long, densely puberulent; ovary 1.5-3.0 cm long, densely puberulent; style 6-15 mm long. Capsule 2.0-3.5 cm long. Seed 0.8-0.9 × 0.2-0.3 mm, papillose; appendage a filiform hair, 6-8 mm long. $2n = 30, 32$. *Fl. & Fr.*: 6-9. *In evergreen forests, along streams; between 100-900 m altitudes.*

Dhaka: BNH Campus, Mirpur, 06 viii 2017, Mahbuba Sultana, DMS-2002 (DACB).
Western Malesia and Thailand.

This introduced species have ornamental value.

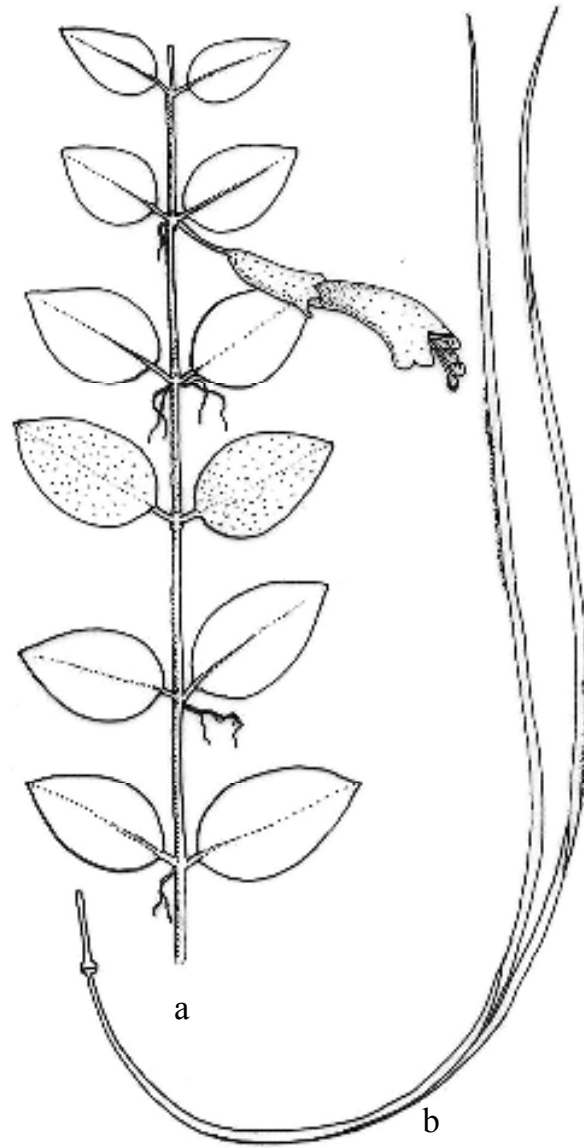


Figure 10. *Aeschynanthus radicans* Jack, a) flowering shoot; b) flower.

Aeschynanthus superbus C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 46. 1874; C.B. Clarke in Hooker, Fl. Brit. India 4: 342. 1884; Barnett, Fl. Siam. 3(3): 203. 1962; Wang *et al.*, Fl. China 18: 379. 1998; Hilliard, Fl. Bhutan 2(3): 1301. 2001; Burt, Thai Forest Bull. (Bot.) 29: 84. 2001; Kress *et al.*, Checkl. Myanmar 262. 2003. *Trichosporum superbum* (C.B. Clarke) Kuntze, Revis. Gen. Pl. 2: 478. 1891. **Fig. 11.**

Epiphyte with ascending and pendulous branches. Stem 50-100 cm long, glabrous. Leaves opposite; petiole 5-15 mm long, glabrous; leaf blades elliptic to obovate, lanceolate or oblong, 8-22 × 1.5-10.5 cm, base cuneate to obtuse, apex abruptly acuminate to acuminate or acute, margin entire, papery to leathery, green, glabrous, secondary veins 4-12 pairs, weakly visible. Inflorescences terminal or axillary, 5-15-flowered cymes; peduncle 1-4 cm long; bracts red, ovate or elliptic, 4-6 × 2-4 cm; pedicels 5-12 mm long, glabrous. Calyx 5-sect from base, lobes elliptic to obovate, erect, 15-35 × 5-10 mm, free to base, orange-red to red, glabrous, apex obtuse to rounded. Corolla 6-9 cm long; bright red with darker lines outside, glabrous outside, glandular hairy inside; limb indistinctly 2-lipped, upper lobes orbicular, oblong or ovate, reflexed or spreading, 1-2 × 0.8-1.2 cm, sinus 5-8 mm deep, apex rounded; lateral lobes elliptic, orbicular or ovate, reflexed, 1-2 × 1.0-1.5 mm, apex rounded; lower lobe ovate or orbicular, spreading, 10-16 × 1.0-1.2 mm, apex rounded. Stamens exerted, fused in 2 pairs; filaments glandular hairy; anterior filaments inserted at 3-4 cm from corolla base, filaments 3.5-4.0 cm long, anthers 3-4 × 1.5-2.0 mm; posterior filaments inserted at 3.5-4.5 mm from corolla base, filaments 2.5-3.0 mm long, anthers 3.0-3.5 × 1.5-2.0 mm; staminode 1.5-4.0 mm long. Disk 1.2-1.6 mm high, annular or 5-crenate. Pistil 6-8 cm long; stipe 2.0-3.5 cm long; ovary 1.5-4.5 mm long, glandular pubescent; style 8-12 mm long, glandular pubescent. Capsule 30-50 cm × 1.5-3.0 mm. Seed grain 0.8-1.0 × 0.15-0.2 mm, papillose, apical appendage a filiform hair, 4.5-7.5 mm long; hilar appendage a single filiform hair, 4.5-6.5 mm long. *Fl. & Fr.*: 8-12. *On trees in evergreen hilly forests; between 300-700 m altitudes.*

Sylhet: Pundua, date unknown (1829!), N. Wallich, 795 (K-000831877).

India, Bhutan, Myanmar, Thailand and China.

The plant can be used as an ornamental plant.



Figure 11. *Aeschynanthus superbus* C.B. Clarke, flowering & fruiting shoot.

Boeica C.B. Clarke

Commelyn. Cyrtandr. Bengal. 118. 1874.

Type species: *B. fulva* C.B. Clarke

Perennial, terrestrial, rhizomatous or stoloniferous herbs or subshrubs. Leaves few to many, alternate, spaced along stem or tufted at apex or rarely forming a basal rosette; petiolate; leaf blade ovate to elliptical, base cuneate to attenuate, puberulent to densely woolly or glabrescent. Inflorescences axillary, lax or dense, umbel-like, 1 to many flowered cymes; bracts 2 and opposite, rarely several and whorled. Calyx actinomorphic, 5 lobed; segments equal, free or fused halfway. Corolla campanulate or flat-faced, 3-7 mm in diameter; limb slightly zygomorphic, upper lip 2-lobed, lower lip 3-lobed, lobes (sub)equal, rounded or acute, white to pink or blue to purple, inside glabrous or puberulent. Stamens 4, inserted near corolla base; filaments short; anthers basifixed, free, thecae subparallel, confluent at apex, dehiscent longitudinally, poricidally, or transversely; connective not projecting; staminode 1, adnate to adaxial side of corolla tube. Disc ringlike or inconspicuous. Ovary ovoid or conical, 1-loculed; placentas 2, parietal, projecting inward, 2-cleft. Stigma 1, terminal, capitate, undivided. Capsule straight in relation to pedicel, linear to narrowly oblong, much longer than calyx, dehiscent loculicidally to base; valves 2, straight, not twisted. Seeds unappendaged.

Boeica filiformis C.B. Clarke, Commelyn. Cyrtandr. Bengal. 118. 1874. C.B. Clarke in Hook.f., Fl. Brit. India 4: 362. 1884; Kanjilal *et al.*, Fl. Assam 3: 397. 1939 (reprint 1982). *Chelone filiformis* Buch.-Ham. *ex* C.B. Clarke, Monogr. Phan. 5: 134. 1883. **Fig. 12.**

English: Thread-like Boeica.

Perennial subshrubs or herbs, up to 2 m tall, rhizomatous, sometimes stoloniferous. Leaves few to many, alternate, crowded near stem apex; leaf blade oblanceolate or obovate, elliptic-lanceolate, 12-18 × 3-6 cm, base cuneate to attenuate, apex acuminate, margins minutely dentate, glabrous to glabrescent, lateral nerves about 9 on either half; petiole 8-10 mm long. Inflorescences lax, axillary, many-flowered cymes; peduncles solitary, 10-15 cm long with capillary branches and pedicels, glabrous; bracts 2, linear and opposite. Calyx actinomorphic, 5-sect from base; segments equal, narrowly

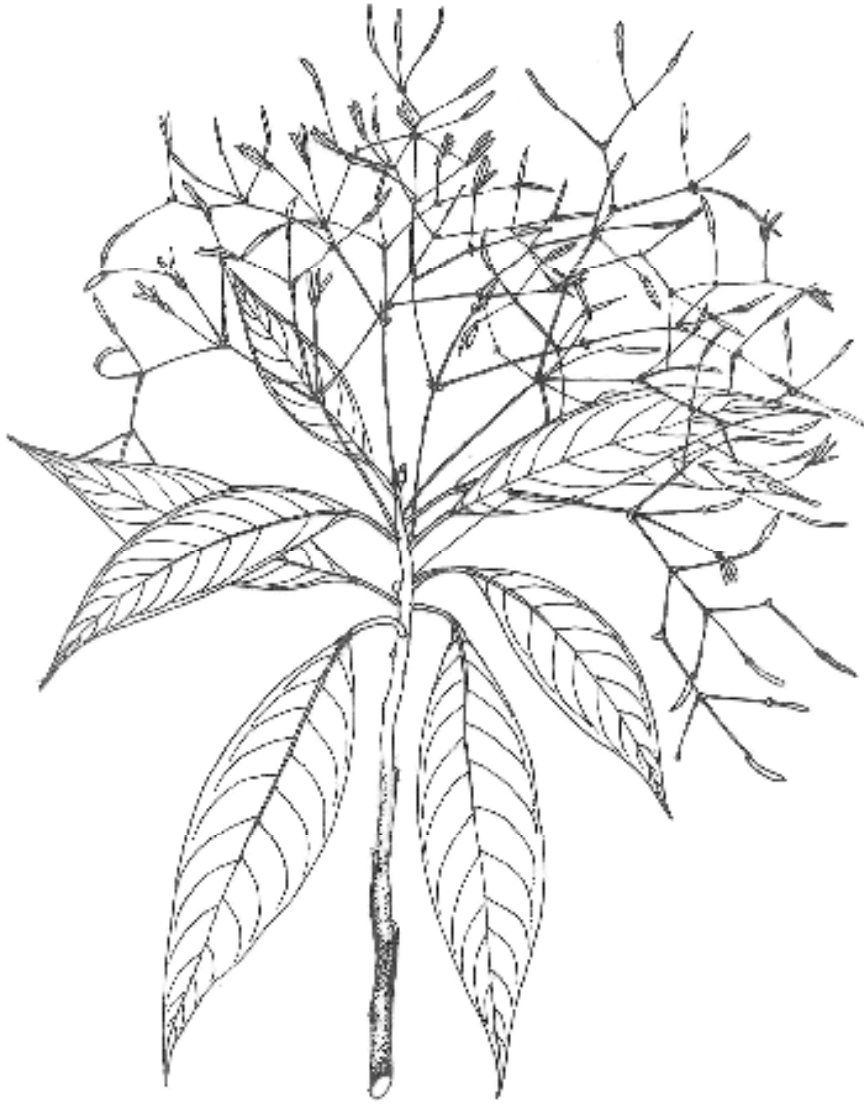


Figure 12. *Boeica filiformis* C.B. Clarke, flowering shoot.

triangular to linear-lanceolate, 2.0-2.5 mm long, outside puberulent, margin entire. Corolla dark pink to white, zygomorphic, inside glabrous or puberulent; tube campanulate, sometimes saccate at base, slightly shorter than limb, 3-7 mm in diameter; limb 2-lipped; adaxial lip 2-lobed, shorter than to abaxial lip; abaxial lip 3-lobed, lobes equal or subequal, apex rounded to acute. Stamens 4, adnate to corolla near base, included; anthers basifixed, purple, free, thecae subparallel, confluent at apex, dehiscing longitudinally, poricidally, or transversely; connective not projecting, filaments ca. 1.5 mm long; staminode 1, adnate to adaxial side of corolla tube. Disc ringlike or inconspicuous. Ovary conical, 1-loculed; placentas 2, parietal, projecting inward, 2-cleft; stigma 1, terminal, capitate, undivided. Capsule straight in relation to pedicel, linear to narrowly oblong, 8-12 mm long, glabrous, dehiscing loculicidally to base, valves 2, straight, not twisted. Seeds unappendaged. *Fl. & Fr.*: 7-11. *Hilly forests, along the spring; 300-600 m altitudes.*

East Bengal: locality & date unknown, W.Griffith, 3840 (CAL-333185).
Moulvibazar: Madhabkundo Eco-park; 25 vi 2001, S.N. Uddin N-1095 (DACB); 23 ix 2011, S.N. Uddin N-4836.

India.

The plant has an ornamental value.

Chrysothemis Dence

Rev. Hort. (Paris), 3: 242. 1849.

Type species: *C. pulchella* (Donn ex Sims) Decne.

Terrestrial or rarely epiphytic, caulescent, erect or sometimes decumbent herbs, tuberous. Stems unbranched. Leaves opposite, equal or subequal in a pair, venation pinnate, foliar nectaries absent. Flowers axillary (but appearing terminal by exceeding stem apex), 1-9-flowered cymose or umbellate, pedunculate inflorescences, with small leafy bracteoles; pedicellate. Calyx lobes 5, basally connate into a tube; corolla yellow to orange, with orange or reddish lines or spots, cylindric, lobes 5; stamens included, filaments basally connate, anthers sometimes coherent, dehiscing by longitudinal slits, thecae parallel;

staminode absent; disc a single dorsal, 2-lobed gland; ovary superior, stigma 2-lobed. Fruit a fleshy, brown capsule, loculicidally dehiscent, 2- to several-valved, valves opening slightly.

Chrysothemis pulchella (Donn ex Sims) Decne. in Rev. Hort. (Paris) 21: 242. 1849. *Besleria pulchella* Donn ex Sims in Bot. Mag. 28: ad pl. 1146. 1808. *Episcia pulchella* (Donn ex Sims) G. Don in Gen. Hist. 4: 656. 1838. *Tussacia pulchella* (Donn ex Sims) Benth. in London J. Bot. 5: 363. 1846. *Skiophila pulchella* (Donn ex Sims) Hanst. in Linnaea 26: 207. 1854. *Tussacia villosa* Benth. in London J. Bot. 5: 363. 1846. *Chrysothemis villosa* (Benth.) Leeuwenb. in Acta Bot. Neerl. 7: f. 3V. 1958. *Chrysothemis aurantiaca* Decne. in Rev. Hort. (Paris) 4: 381. 1850. **Fig. 13.**

English: Sunset bells, Black Flamingo, Copper Leaf, Chrysothemis.

Terrestrial herb, 5-40(-90) cm tall. Stem succulent, erect when young, decumbent with age, densely puberulent to pilose towards apex, glabrescent below. Leaves equal in a pair; petiole <1-3.5 cm long, puberulous to pilose; blade membranous to papyraceous when dry, lanceolate, elliptic to ovate to oblong-ovate, 9-30 x 3-14.5 cm, margin crenate or dentate, apex acute, base short to long decurrent into petiole, above sparsely pilose to subsabrous, or villous, below pilose to puberulous. Flowers in umbellate, 3-9-flowered inflorescences; peduncle <1.5(-5) cm long, puberulous to pilose; pedicel 1.0-2.5 cm long, puberulous to pilose. Calyx tubular-campanulate, not inflated, base rounded, 5-angled or -winged, orange to red, tube 1-1.8 cm long, free portion of lobes erect, subequal, broadly triangular, 0.25-0.5 x 0.35-0.5 cm, margin glandular-denticulate, apex abruptly acuminate, outside pilose to villous, inside glabrous or rarely pubescent. Corolla erect in calyx, orange or yellow, 1.6-3 cm long, tube cylindric, base gibbous, 0.3-0.6 cm wide, middle ampliate, throat not constricted, 0.3-0.5 cm wide, outside glabrous near base, white sericeous above, inside glandular pubescent, limb 1-1.5 cm wide, lobes subequal, spreading, suborbicular, 0.3-0.8 x 0.3-0.8 cm, margin entire; stamens included,

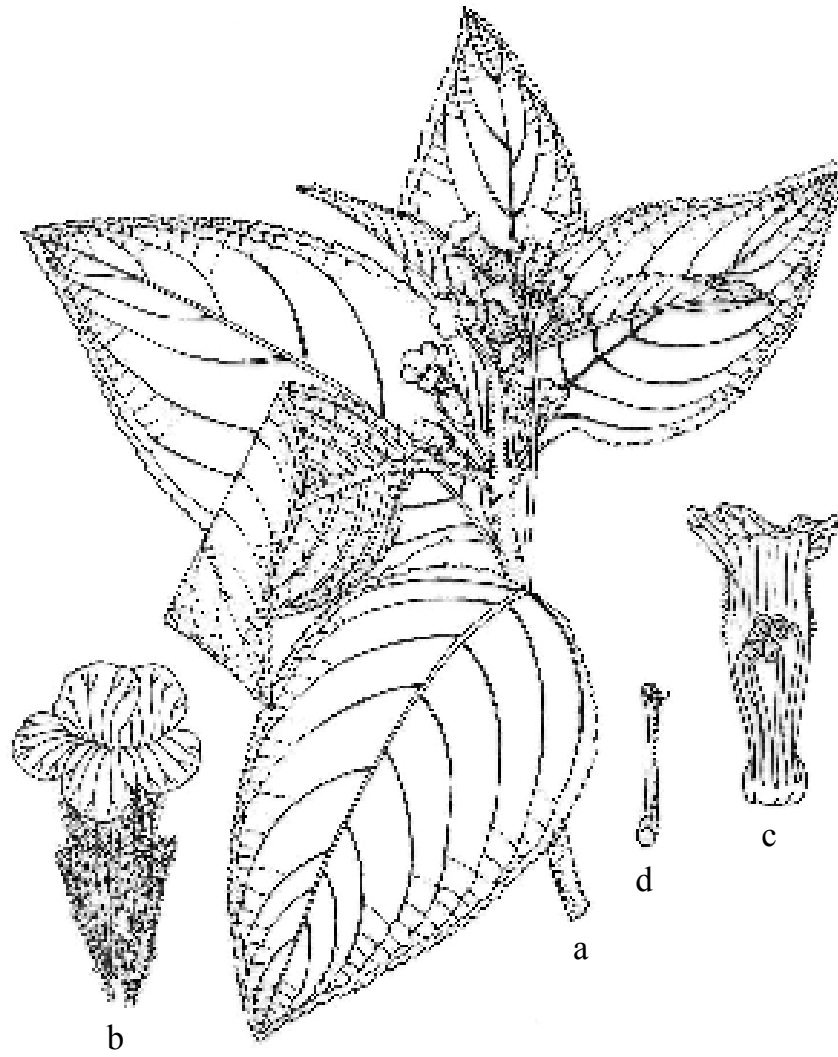


Figure 13. *Chrysothemis pulchella* (Donn *ex* Sims) Decne., a) flowering shoot; b) flower; c) opened corolla with stamens; and d) pistil.

inserted at base of corolla tube; ovary conic, 0.2-0.4 × 0.2-0.3 cm, pubescent, style 0.7-1.1 cm long, glabrous, stigma deeply 2-lobed. Mature capsule yellow-green, ovoid, ca. 0.6 × 0.6 cm. 2n = 18 (Fedorov, 1969). *Fl. & Fr.*: 5-9. *Well drained and shady-moist gardens.*

Dhaka: Sisso Academy Garden, Ramna, 16 x 2002, Mokarram Hossain 01 (DACB).

West Indies, Nicaragua to Panama, Colombia to the Guianas and Brazil.

This introduced species can be used as a house plant or interior ornamental plant.

Didymocarpus Wall.

Edinburgh Philos. J. 1: 378. 1819.

Type species: *D. aromaticus* Wall.

Perennial, terrestrial or epipetric, rhizomatous, acaulescent or caulescent herbs, rarely shrubs or subshrubs. Leaves simple, opposite, whorled, or alternate or basal, equal to subequal in a pair; leaf blade sparsely to densely puberulent to pubescent, rarely nearly glabrous, short strigose, or woolly, base cuneate to cordate, rarely auriculate.. Inflorescence axillary scapose, paniculate, sometimes umbel-like, lax or sometimes dense, 1- many flowered cymes; bracts 2, opposite. Calyx actinomorphic, small, 5-lobed or partite, or zygomorphic and 2-lipped, 5- or 3-lobed from base to shallowly lobed; segments equal to unequal. Corolla zygomorphic, campanulate, tube cylindrical to funnellform-tubular, 2-13 mm in diameter, curved, oblique at the throat, inside glabrous, rarely sparsely puberulent, limb 2-lipped; adaxial lip 2-lobed; abaxial lip 3-lobed, lobes equal or central lobe longer, apex rounded, rarely obtuse to acute, blue to wine-red, rarely pink, white, or yellow. Fertile stamens 2, adnate to abaxial side of corolla tube near or above middle, inserted near the base of corolla tube, filaments short, curved, glabrous, anthers dorsifixed, connate, applanate, bilocular, locules confluent, dehiscing longitudinally; staminodes 2, rarely 3, small, swollen at the tip, adnate to adaxial or adaxial and abaxial sides of corolla tube. Disk ringlike, rarely cupular. Ovary linear, sessile or stalked, unilocular with 2 intruding, recurved, parietal placentae; styles slender; stigmas oblique, subcapitate or flattened, depressed-globose to disclike or truncate,

undivided, rarely 2-lobed. Fruit a linear capsule, much surpassing calyx, loculicidally dehiscent into 2-4 valves. Seeds small, ellipsoid, smooth or minutely reticulate.

KEY TO THE SPECIES

- | | | |
|----|---|----------------------|
| 1. | Cymes subracemose; calyx sub-5-partite | D. mollis |
| + | Cymes subcorymbose; calyx 5-lobed | 2 |
| 2. | Corolla very sparsely hairy, purple; capsules slightly curved | D. punduanus |
| + | Corolla glabrous, white or very pale purple; capsules erect | D. acuminatus |

Didymocarpus acuminatus R.Br., *Cyrtandreae* 118. 1839. C.B. Clarke in Hook.f., *Fl. Brit. India* 4: 349. 1884; Kanjilal *et al.*, *Fl. Assam* 3: 396. 1939 (reprint 1982). *Roettlera acuminata* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 475. 1891. *Chirita acuminata* (R.Br.) A. DC., *Prodr.* 9: 269. 1845. *Calosacme acuminata* Wall., *Numer. List* 802. 1829. *Babactes oblongifolia* A.DC., *Prodr.* 9: 260. 1845. **Fig. 14.**

Perennial herbs. Stems erect, 40-90 cm, rust-brown puberulent apically. Leaves opposite, widely spaced along stem; petiole 1.5-4.5 cm long; leaf blade ovate to elliptic or oblong, 6-18 × 5-10 cm, base oblique, cuneate to cordate, margin denticulate, apex acuminate, papery, densely puberulent, densely yellow glandular, lateral veins 8-13 on each side, conspicuous. Cymes 5-7-flowered; peduncle 2-4 cm long, densely rust-brown puberulent; bracts 2, free, narrowly ovate, densely puberulent, margin denticulate, apex acute. Pedicel 0.5-1.5 cm long, densely rust-brown puberulent. Calyx 1.0-1.5 cm long, 5-lobed from above middle; tube 7-9 mm long; lobes equal, triangular, 3-5 mm long, outside densely puberulent and glandular, inside glabrous with very short hairs near apex, margin entire, apex acute to acuminate. Corolla white with yellow at throat, 4.0-4.5 cm, outside sparsely puberulent, inside glabrous; tube funnelform; adaxial lip 4-7 mm broad; abaxial lip 0.9-1.2 cm broad. Filaments 1.2-1.4 cm long, glabrous; anthers fused by entire adaxial surfaces, ca. 1.5 mm long, glabrous; staminodes 3. Pistil ca. 2.5 cm long, puberulent; ovary ca. 2 cm long; stigma obdeltoid, 2-5 mm long, emarginate or 2-lobed. Capsules erect, 5-7 cm long. *Fl. & Fr.*: 8-10. *Hilly evergreen forests; between 400-800 m altitudes.*

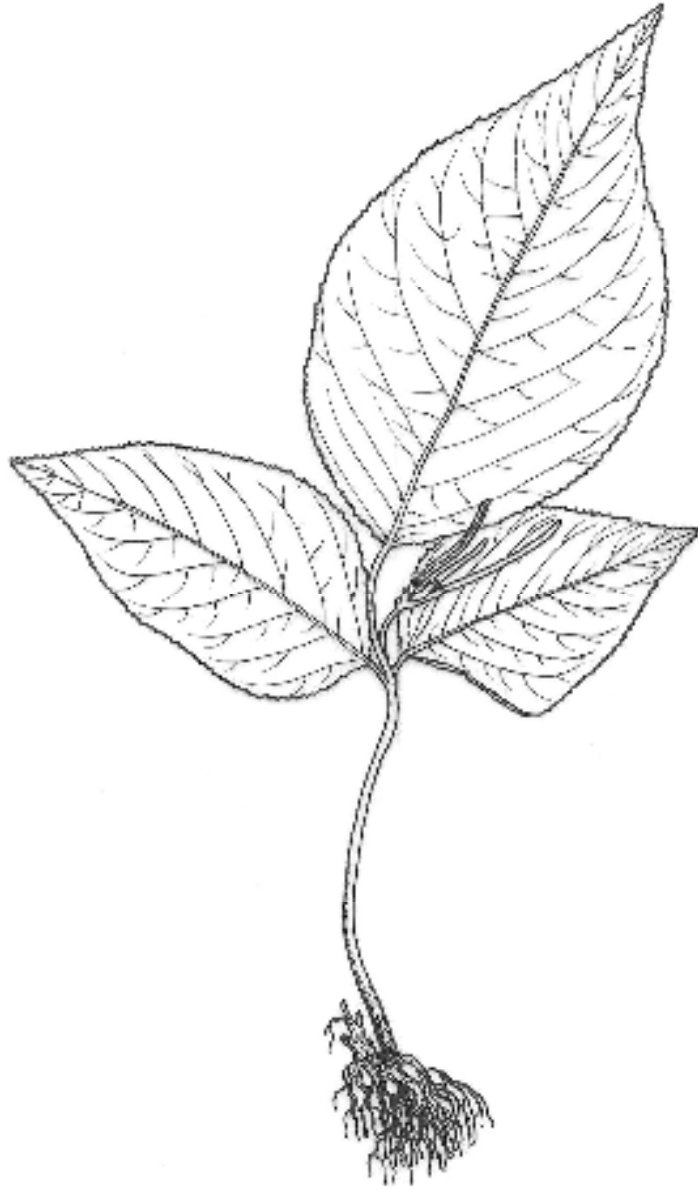


Figure 14. *Didymocarpus acuminatus* R.Br., fruiting shoot.

East Bengal: locality & date unknown, W.Griffith, 3529 (CAL 332901). **Rangamati:** Kassalong, 10 I 1869, CB Clarke 8263 (CAL 332908); Borkol, 14 iii 1876. JL Lister 13 (CAL 332979). **Sylhet:** Pundua, 15 ix 1822, F. De Silva, HI 802 (K-001111925 & K-001111924).

India, Myanmar and China.

Didymocarpus mollis Wall. ex C.B. Clarke, Monogr. Phan. 5: 83. 1883. C.B. Clarke in Hook.f., Fl. Brit. India 4: 350. 1884; Prain, Beng. Pl. 2: 783. 1903 (Indian reprint 2004); Heinig, List Pl. Chitt. 48. 1925; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 241. 2009. *Roettlera mollis* Kuntze, Revis. Gen. Pl. 2: 476. 1891. **Fig. 15.**

Annual herbs. Stem up to 20 cm tall, densely villous, near the base hirsute with fulvous deflexed hairs. Leaves simple, opposite, or the 4 uppermost sub-verticillate; petioles 8-10 mm long or absent; leaf blades ovate-elliptic or elliptic, 8-12 × 4-5 cm, base cuneate, apex acute, margin crenate, membranous, glabrous above, hairy beneath or at least on the nerves, nerves 9-11 pairs. Inflorescence subterminal, 10-12 flowered, lax or paniculate cymes; peduncles 8-10 cm long; pedicels 0.4-0.6 cm long, pubescent; bracts lanceolate. Calyx very deeply divided, segments linear, 2.5-3.0 mm long, obtuse, pubescent. Corolla tube slightly gibbous at the base, slightly constricted at the throat, 8-10 mm long, pinkish-violet with prominent darker veins, glabrous, lower 3 lobes 4-6 mm long, upper 2 lobes 3-4 mm long, rounded. Filaments glabrous, 2.5-3.0 mm long, anthers glabrous, staminodes 2 or 3, slightly swollen at the tip. Disk shortly cylindrical. Ovary oblong, glabrous, styles glabrous, stigmas capitate, 3 mm long. Fruits folicular, linear, 10-15 × 2-3 mm, sessile, dehiscent symmetrically into 2-valves, glabrous. *Fl. & Fr.:* 6-10. *Shady banks and rock-faces in the forests; between 300-1000 m altitudes.*

Sylhet: locality & date unknown, N.Wallich, 790 (K-001111903)

India, Myanmar and Bhutan.

Leaves are used for fomenting in case of swellings and pain on the ankle and wrist.

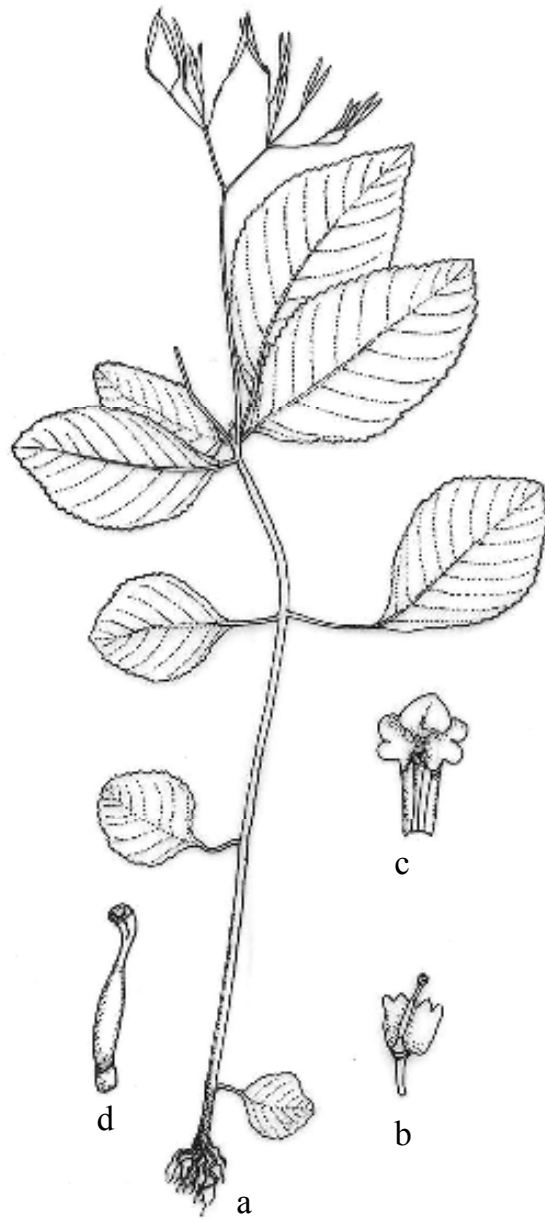


Figure 15. *Didymocarpus mollis* Wall. ex C.B. Clarke, a) fruiting shoot; b) opened calyx with pistil; c) opened corolla with stamens; and d) pistil.

Didymocarpus punduanus Wall. ex R.Br., Pl. Jav. Rar. 118. 1840; C.B. Clarke in Hook.f., Fl. Brit. India 4: 349. 1884; Kanjilal *et al.*, Fl. Assam 3: 395. 1939 (reprint 1982). *Roettlera punduana* Kuntze, Revis. Gen. Pl. 2: 476. 1891. **Fig. 16.**

Stems 5-25(-40) cm long, densely puberulent to glabrescent. Leaves opposite; petiole 0.3-1.2 cm long; leaf blade narrowly ovate to ovate, oblong, or obovate, 1-15 × 1-10 cm, herbaceous, base oblique, broadly cuneate to cordate, apex acute to rounded, margins crenate to crenulate or nearly entire, adaxially appressed puberulent, eglandular, abaxially puberulent along veins, eglandular, lateral nerves 5 or 6 pair. Inflorescence 1-15-flowered cymes; peduncle 1-12 cm, sparsely glandular puberulent; bracts free, ovate to orbicular, often leaflike, 0.2-2 cm long, glabrous to puberulent, yellow glandular, margin crenate to entire; pedicel 4-10 mm long. Calyx slightly zygomorphic, 3-6 mm long; limb indistinctly 2-lipped; tube 2-4 mm long; adaxial lip 3-lobed, depressed trapeziform, ca. 2 mm wide, lobes triangular, 1-2 × 1.0-1.2 mm; abaxial lip 2-lobed, depressed trapeziform, 2-3 mm wide, lobes triangular, 1-2 × 1.8-2.0 mm, outside sparsely puberulent, inside glabrous, margin entire. Corolla purple to reddish purple with darker stripes, 2.5-3.5 cm long, outside sparsely pubescent, inside glabrous; tube narrowly funneliform, 20-28 × 4-6 mm; adaxial lip 3-4 mm wide; abaxial lip 6-8 mm wide. Filaments 6-8 mm long, glabrous; anthers 1.8-2.0 mm long, sparsely pubescent; staminodes 3, 1.2-5.0 mm long. Pistil 2.3-3.2 cm long, glabrous; ovary 7-8 mm long. Capsules 3-4 cm long. *Fl. & Fr.*: 6-10. *On rocks and cliffs in valleys; between 500-800 m altitudes.*

Sylhet: Pundua, 15 viii 1824, F. De Silva, 777 (K-001111883)

India and China.

Henckelia Spreng.

Arbeit. 2: 405. 1817.

Type species: *H. incana* (Vahl) K.P.J. Spreng.

Perennial or rarely annual herbs. Stems erect, ascending or creeping. Leaves opposite, alternate or whorled, shortly to long petiolate, lamina form very variable, ranging from ribbon-like to suborbicular, often ovate or lanceolate, sometimes pinnately lobed, usually



Figure 16. *Didymocarpus punduanus* Wall. ex R.Br., flowering shoot.

hairy. Inflorescences axillary, 1–15-flowered cymes, pedunculate; bracts paired, free or connate, caducous. Sepals 5, triangular or narrowly triangular, free to base or basally connate. Corolla variously colored, often with yellow markings in throat, often infundibuliform, rarely campanulate or flat-faced, bilabiate with 2-lobed upper lip and 3-lobed lower lip. Stamens 2, usually included in the corolla, filaments long, often with an apical spur, anthers cohering. Nectary cylindrical, cup-shaped, sometimes lacking. Ovary usually slender conical or ovoid; stigma chiritoid. Fruit usually a long plagiocarpic capsule, held horizontally and splitting into 2 valves or opening only along the dorsal side. Seeds numerous, with various testa patterns.

KEY TO THE SPECIES

- | | | |
|----|--|------------------------|
| 1 | Plants stemless, or obscurely stemmed; stems less than 5 cm long, prostrate, rooting at nodes; corolla blue-purple | H. speciosa |
| + | Plants distinctly stemmed; stems more than 5 cm long, erect, not rooting at nodes; corolla white | 2 |
| 2 | Calyx lobes lanceolate; corolla without yellow mark | H. dimidiata |
| + | Calyx lobes triangular; corolla with yellow mark | 3 |
| 3. | Stem and peduncle glabrous to sparsely pubescent; calyx lobes slightly unequal; stigma strongly bilobed | H. anachoreta |
| + | Stem and peduncle densely rust-brown pubescent; calyx lobes equal; stigma emarginated or shallowly bilobed | H. oblongifolia |

Henckelia anachoreta (Hance) D.J. Middleton & Mich.Möller, *Taxon* 60: 774. 2011. *Chirita anachoreta* Hance, *Ann. Sci. Nat., Bot. sér. 5*: 5: 231. 1866. *Chirita dimidiata* R. Br., *Pl. Jav. Rar.* 117. 1840; C.B. Clarke in Hook.f., *Fl. Brit. India* 4: 357. 1884. *Chirita minutiserrulata* Hayata, *Icon. Pl. Formosan.* 5: 133. 1915. *Didymocarpus anachoretus* (Hance) H. Lév., *Compt. Rend. Assoc. Franç. Avancem. Sci.* 34: 427. 1905 (publ. 1906). *Didymocarpus minutiserrulatus* (Hayata) Yamam., *J. Soc. Trop. Agric.* 8: 72. 1936. *Roettlera anachoreta* (Hance) Kuntze, *Revis. Gen. Pl.* 2: 476. 1891. **Fig. 17.**

Annual herbs. Stems erect, 5-50 cm tall, glabrous to sparsely pubescent. Stem leaves 4-10, opposite, widely spaced; petiole 0.2-6 cm long; leaf blade oblique, lanceolate to ovate or elliptic, 4-15 × 1.5-7.5 cm, base oblique, broadly cuneate to cordate, apex acute



Figure 17. *Henckelia anachoreta* (Hance) D.J. Middleton & Mich.Möller, flowering shoot.

to acuminate, margin denticulate to serrulate or crenulate, herbaceous, sparsely puberulent to pilose or nearly glabrous, lateral nerves 6-10 pairs, conspicuous. Inflorescence 1-3(-7)-flowered cymes; peduncle 3-7 cm long, glabrous to sparsely pubescent; bracts 2, free, lanceolate to ovate, 5-12 × 2-5 mm, ciliate to puberulent, margin entire to remotely denticulate, apex acute; pedicel 0.5-1.8 cm long, glabrous to sparsely pubescent. Calyx 1.0-1.6 cm long, 5-lobed from near middle; tube 3-12 mm long; lobes slightly unequal, narrowly triangular to triangular, 5-7 × 3-4 mm, outside pilose to sparsely puberulent or glabrous, inside glabrous, margins entire, apex acuminate. Corolla white to yellow with yellow or purple markings or blue-purple, 2-6 cm long, outside glabrous to sparsely puberulent, inside glabrous; tube 2-4 × 1.0-1.5 cm; adaxial lip 7-10 mm long; abaxial lip 1.2-1.5 cm long. Filaments 1.0-1.2 cm long, glabrous to sparsely puberulent; anthers fused, 2-3 mm long, usually glabrous; staminodes 2 or 3, 3-5 mm long. Pistil 2-3 cm long, glabrous or sparsely hairy; ovary 1.5-2.5 cm long; stigma obtrapeziform, 3.5-4.5 mm long, deeply bi-lobed. Capsule erect, 7-12 cm long, linear cylindrical. $2n = 18$ (Fedorov, 1969). *Fl. & Fr.*: 7-11. *Rocks in forests, along stream sides; between 200-500 m altitudes.*

Sylhet: Pundua, 1830, N. Wallich, HI 803 (K-000858407 & K-000858408).

Sikkim, Myanmar, Thailand, Laos, Vietnam and China.

Henckelia dimidiata (Wall. ex C.B. Clarke) D.J. Middleton & Mich. Möller, *Taxon* 60: 775. 2011. *Calosacme dimidiata* Wall., *Numer. List* 803. 1829. *Roettlera dimidiata* (Wall. ex C.B. Clarke) Kuntze, *Revis. Gen. Pl.* 2: 476. 1891. *Chirita dimidiata* Wall. ex C.B. Clarke, *Monogr. Phan.* 5: 115. 1883. *Chirita polyneura* var. *amabilis* C.B. Clarke, *Commelyn. Cyrtandr. Bengal.* t. 76. 1874. **Fig. 18.**

Perennial herbs. Stems erect, up to 50 cm tall, branched, hairy. Leaves opposite, often unequal, shortly to long petiolate, lamina elliptic, 8-14 × 4-6 cm, apex acuminate, margin serrate, mature strigose above, glabrous beneath; petiole 13-18 mm long. Inflorescences axillary, many flowered cymes; peduncle 3-5 cm long; bracts paired, free or connate, ovate or oblong, thinly ciliate, caduceous; pedicels 6-8 mm long. Calyx 5-fid half-way down, 16-20 mm long, segments narrowly lanceolate, 7-9 mm long, free to base or basally connate, nearly glabrous whitish. Corolla 3.7-5.0 cm long, white, mouth purple-

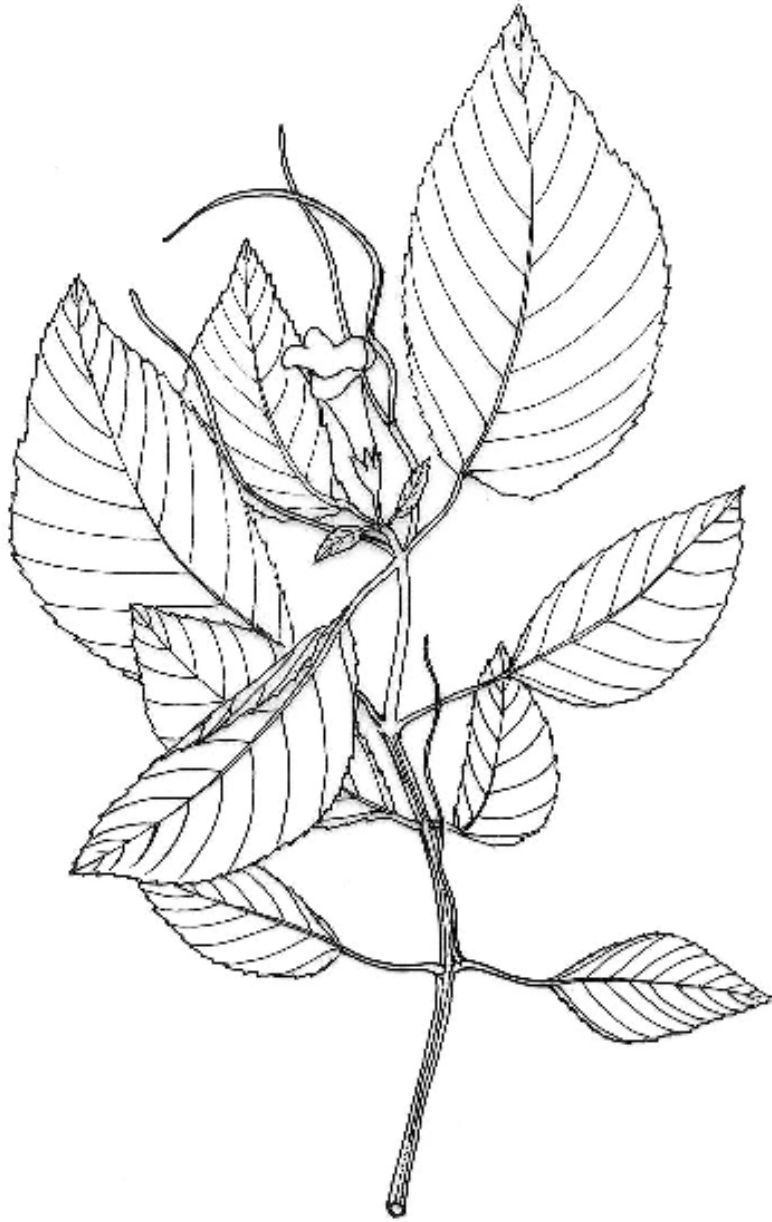


Figure 18. *Henckelia dimidiata* (Wall. ex C.B. Clarke) D.J. Middleton & Mich. Möller, flowering shoot.

blue, without the yellow tinge, often infundibuliform, rarely campanulate or flat-faced, bilabiate with 2-lobed upper lip and 3-lobed lower lip. Stamens 2, glabrous, usually included in the corolla, filaments 1.2 cm long, often with an apical spur, anthers cohering. Nectary cylindrical, cup-shaped, sometimes lacking. Ovary usually slender conical or ovoid; stigma 4 mm long, unilateral, bifid. Fruit usually a long plagiocarpic capsule, 8-12 cm long, held horizontally and splitting into 2 valves or opening only along the dorsal side. Seeds numerous, dark brown, elliptic, 0.15-0.2 mm long, with various testa patterns. *Fl. & fr.*: 8-10. *Growing on wet, acidic soils and rocks.*

Sylhet: Pundua, 15 viii 1824, F. De Silva, HI 803 (K-001111926).

India.

Henckelia oblongifolia (Roxb.) D.J.Middleton & Mich.Möller, *Taxon* 60: 776. 2011. *Chirita oblongifolia* (Roxb.) J. Sinclair, *Fl. Cox's Bazar*: 102. 1956; *Bull. Bot. Soc. Bengal* 9: 102. 1957; Uddin in Ahmed *et al.*, *Encycl. Fl. Fauna Bangladesh* 8: 240. 2009. *Chirita acuminata* Wall. *ex R.Br.*, *Pl. Jav. Rar.* 117. 1840; C.B. Clarke in Hook.f., *Fl. Brit. India* 4: 359. 1884; Prain, *Beng. Pl.* 2: 783. 1903 (Indian reprint 2004); Heinig, *List Pl. Chitt.* 48: 1925; Kanjilal *et al.*, *Fl. Assam* 3: 396. 1939 (reprint 1982). *Incarvillea oblongifolia* Roxb., *Fl. Ind.* ed. 2, 3: 113. 1832. *Babactes oblongifolia* (Roxb.) DC *ex Meisner*, *Pl. Vasc. Gen.*, 2: 211. 1840. *Roettlera oblongifolia* (Roxb.) Kuntze, *Revis. Gen. Pl.*, 2: 475. 1891. **Fig. 19.**

Perennial herbs or eventually shrubs. Stem up to 2 m tall, densely rust-brown pubescent apically, rooting at the base. Leaves simple, opposite; leaf blade ovate to elliptic or oblong, 10-25 × 4-12 cm, apex acute to acuminate, base cuneate to cordate, often oblique, margin denticulate to serrulate, papery, lateral veins 8-13 on each side of midrib, conspicuous, upper surface more densely pubescent than lower surface, glands globose, yellow; petioles 2-10 cm long. Inflorescence in upper leaf-axils, flowers solitary or 5-7-flowered cymes; peduncles 1-4 cm long, densely rust-brown puberulent; pedicels 0.5-3.0 cm long, bracts 2, free, narrowly ovate-lanceolate, 5-10 × 1-2 mm, densely puberulent, margin denticulate, apex acuminate; pedicel 0.5-1.5 cm long, densely rust-brown puberulent. Calyx 1.1-1.4 cm long, 5-lobed from above middle, tube 5-10 mm long; lobes equal, triangular, acute, 5-10 × 4-5 mm, outside densely pubescent and

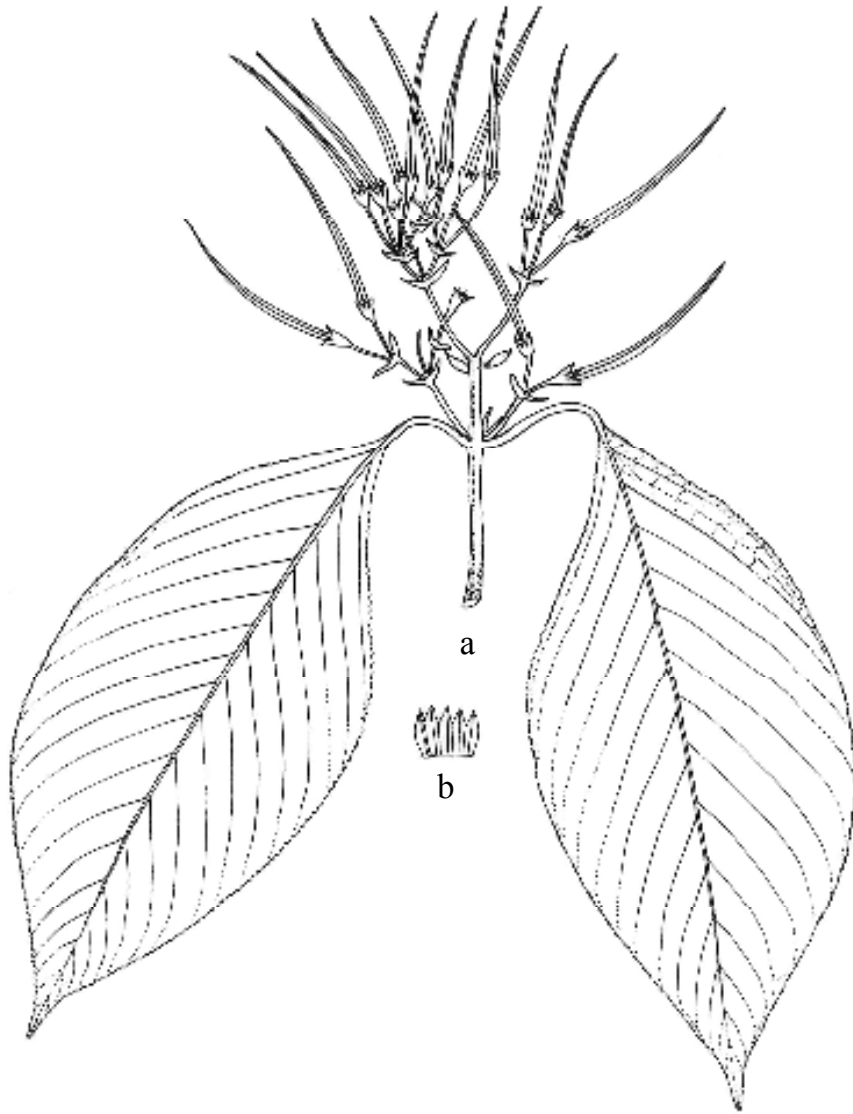


Figure 19. *Henckelia oblongifolia* (Roxb.) D.J.Middleton & Mich.Möller, a) flowering shoot; and b) opened calyx.

gland-dotted, inside glabrous with very short hairs near apex, margin entire, apex acute to acuminate. Corolla glandular puberulous, 4-5 cm long, cylindric in lower part, narrowly funnel-shaped above, 2.7-3.0 × 1.2-1.4 cm; bilabiate, adaxial lip ca. 7 mm wide; abaxial lip ca. 1.2 cm wide creamy-white, 2 dark yellow warty keels at the base of lower lip, outside sparsely puberulent, inside glabrous. Filaments ca. 1.3 cm long, glabrous; anther fused by entire adaxial surfaces, ca. 1.5 mm long, glabrous, connectives glandular; staminodes 3, central ca. 0.6 mm long, laterals ca. 6 mm long. Pistil ca. 2.5 cm long, puberulent; ovary densely pubescent and gland-dotted, stigmas obtuse-trapeziform to obdeltoid, ca. 2-5 mm long, emarginate or 2-lobed. Fruits capsular, erect, densely pubescent, 45-90 × 2-3 mm. *Fl. & Fr.*: 8-12. *Hilly evergreen forests; between 300-800 m altitudes.*

Bandarban: Sangu Reserve, 15 ii 2015, SN Uddin N 5722 (DACB).

Bhutan, India, Myanmar and China.

Leaves are used by some tribal communities for fomenting in case of swellings and pain on the ankle and wrist.

Henckelia speciosa (Kurz) D.J. Middleton & Mich.Möller, *Taxon* 60: 777. 2011. *Chirita speciosa* Kurz, *J. Bot.* 11: 195. 1873. *Chirita brevipes* C.B. Clarke, *Monogr. Phan.* 5: 120. 1883; C.B. Clarke in Hook.f., *Fl. Brit. India* 4: 359. 1884. *Chirita trailliana* Forrest & W.W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 9: 95. 1916. *Didymocarpus brevipes* (C.B. Clarke) Hand.-Mazz., *Symb. Sin.* 7: 883. 1936. *Didymocarpus speciosus* (Kurz) Hand.-Mazz., *Symb. Sin.* 7: 883. 1936. *Didymocarpus traillianus* (Forrest & W.W. Smith) Hand.-Mazz., *Symb. Sin.* 7: 883. 1936. *Roettlera brevipes* (C.B. Clarke) Kuntze, *Revis. Gen. Pl.* 2: 476. 1891. *Roettlera speciosa* (Kurz) Kuntze, *Revis. Gen. Pl.* 2: 477. 1891. **Fig. 20.**

Perennials, rhizomatous herbs. Stemless or up to 5 cm long, rust-brown pilose. Leaves 4-6, along stem or crowded at apex, alternate; petiole 2-17(-25) cm long; leaf blades oblique, ovate to suborbicular, 5-19 × 3.7-13 cm, herbaceous, adaxially sparsely white pubescent, eglandular, abaxially leaves often purplish, especially along veins, rust-colored pilose, especially along veins, base oblique, cordate to rounded, margin dentate



Figure 20. *Henckelia speciosa* (Kurz) D.J. Middleton & Mich.Möller, flowering shoot.

to serrate or crenate, apex acuminate to rounded; lateral veins 6-9 on each side, conspicuous. Inflorescence 1-6-flowered cymes; peduncle 3-15 cm long, rust-brown pubescent to villous; bracts 1 or 2, free, narrowly ovate to oblong, 6-15 × 1-4 mm, rust-brown villous, margin entire to serrulate, apex acute; pedicel 0.8-2.0 cm long, rust-brown pubescent. Calyx 1.0-2.5 cm long, 5-lobed from above to near middle; tube 5-10 mm long; lobes unequal, narrowly triangular, 0.7-1.5 cm × 3-4 mm, outside rust-brown pubescent to villous, inside glabrous, margin entire, apex subulate-acuminate. Corolla blue-purple with yellow marks within tube, 4.5-6.5 cm long, outside sparsely puberulent to pilose, inside puberulent; tube narrowly funnelform, 3.5-4.5 × 1.2-1.8 cm; adaxial lip 1.0-1.2 cm broad; abaxial lip 1.6-1.8 cm broad. Filaments 9-11 mm long, glabrous to sparsely pubescent; anthers fused by entire adaxial surfaces, 4.0-6.5 mm, densely puberulent; staminode 1. Pistil 3.0-3.5 cm long, puberulent; ovary 2.0-2.4 cm long; stigma flabellate, 3-4 mm long, bi-lobed. Capsules 7-9 cm long. $2n = 18$ (Yuanxue *et al.*, 2002). *Fl. & Fr.*: 3-7. *On wet rocks: between 300-700 m altitudes.*

East Bengal: locality & date unknown, W.Griffith, 3828 (CAL 333030).

India, Myanmar, Thailand, Vietnam and China.

Paraboea (C.B.Clarke) Ridl.

J. Straits Branch Roy. Asiat. Soc. 44: 4, 63. 1905.

Type Species: *P. clarkei* B.L. Burtt.

Perennial, epipetric or terrestrial, rhizomatous, rosulate or caulescent herbs. Stems often woody at base, branched, occasionally monocarpic, woolly when young. Leaves opposite, alternate or whorled; upper surface glabrous, glabrescent, or with scabrous hairs; lower surface mostly with a densely matted indumentum. Inflorescence axillary, subterminal or terminal, 1 to many-flowered cymes. Calyx equally divided almost to base into 5 lobes. Corolla obliquely campanulate or with a short tube and flat limb, bilabiate, white, blue or violet. Stamens 2, inserted in the corolla tube; filaments thick; anthers robust, bright yellow; staminodes present or not. Ovary cylindrical, distinct or not from the style; stigma usually small, terminal. Fruit a capsule, dehiscent along margins, straight or spirally twisted, usually cylindrical or slightly flattened. Seeds unappendaged.

Paraboea multiflora (R. Br.) B.L. Burt, Notes Roy. Bot. Gard. Edinburgh, 41(3): 433. 1984. *Boea multiflora* R.Br., Pl. Jav. Rar. 120. 1840; C.B. Clarke in Hook.f., Fl. Brit. India 4: 365. 1884; Kanjilal *et al.*, Fl. Assam 3: 398. 1939 (reprint 1982). *Didymocarpus multiflorus* Wall., Numer. List 793. 1829. **Fig. 21.**

Perennial, rosulate herbs. Stems woody or not, rhizome up to 20 cm long. Leaves congested in a rosette or sometimes cauline on an extending rhizome; petiole 1-12 cm long; blades unequal, elliptic or rarely ovate, 4-22 × 3-9 cm, apex obtuse, base cuneate or slightly cordate, margin crenate, upper surface glabrescent or pubescence, lower surface with a greenish or ferruginous matted indumentum; lateral nerves 10-15 pairs. Inflorescence axillary, many-flowered cymes, 5-25 cm long; peduncle 4-20 cm long, bracts inconspicuous; pedicels 2-7 mm long. Calyx 1.5-2.5 mm long, 5-lobed to the base, lobes ovate or narrowly ovate, 1.0-1.3 × 0.5-0.8 mm, glabrous inside, minutely greyish pubescent outside. Corolla white, 4-5 mm long, pubescent; tube c.1 mm long, limb indistinctly 2-lipped, 2 lobes of the upper lip and 3 lobes of the lower lip similar in size. Anthers ellipsoid, c. 2 × 2 mm, yellowish, basifixed; filaments inserted at the corolla base. Ovary ovoid, 2.0-2.5 × 0.8-1.2 mm, whitish to greenish farinose; style distinct from the ovary, 2-3 mm long, glabrous; stigma capitate. Fruit a narrow-ovoid capsule, 0.6-1.2 cm long, greyish to greenish farinose, spirally twisted. Seeds ovoid or ellipsoid, 2-3 × 1.5 mm. *Fl. & Fr.*: 6-9. *On limestone.*

East Bengal: locality & date unknown, W.Griffith 3843 (P,W). **Sylhet:** Pundua, date unknown (1824!), F. De Silva, 793 (K-001111906).

India, Bhutan, Burma, Laos, Vietnam, Thailand and China.

Rhynchoglossum Blume

Bijdr. 741. 1826.

Type species: *R. obliquum* Blume

Perennial or annual herbs. Stems branched or simple, terete, glabrous or sparsely pubescent. Leaves few, along stem, alternate, nearly distichous, petiolate, exstipulate; leaf blade puberulent to glabrous, base sometimes strongly oblique, cuneate to cordate. Inflorescences pseudoterminal or axillary, lax or scorpioid, few to many flowered cymes



Figure 21. *Paraboea multiflora* (R. Br.) B.L. Burtt, flowering shoot.

or racemes; bract 1, opposite to each flower, alternate, sometimes absent. Calyx actinomorphic, 5-lobed, segments equal, tube infundibuliform, campanulate or urceolate, white, pale green to dark green, semi-translucent. Corolla white, blue to purple, zygomorphic, inside glabrous or sparsely puberulent near mouth; tube cylindric, not swollen; limb 2-lipped; adaxial lip 2-lobed, shorter than abaxial lip; abaxial lip 3-lobed, seldom undivided, lobes equal or subequal, apex rounded and mucronulate or acute to obtuse. Stamens 2 or 4, filament flat or terete, adnate to corolla tube near middle; anthers basifixed or dorsifixed, coherent in pairs, thecae nearly parallel or divaricate, confluent at apex, dehiscing longitudinally; connective not projecting; staminodes 2-3, or absent. Disc cupular. Ovary ovoid, 1-loculed; placentas 2, parietal; stigma 1, terminal, subglobose, undivided. Fruit a capsule, straight, globose or ovoid to elongate, dehiscing loculicidally, enclosed with calyx remnant. Seeds minute, cuneate, unappendaged.

Rhynchoglossum obliquum Blume, Bijdr. Fl. Ned. Ind. 14: 741. 1826; C.B. Clarke in A. DC & C. DC., Monogr. Phan. 5: 161. 1883; C.B. Clarke in Hook.f., Fl. Brit. India 4: 367. 1884; Prain, Beng. Pl. 2: 784. 1903 (Indian reprint 2004); Kanjilal *et al.*, Fl. Assam 3: 398. 1939 (reprint 1982); B.L. Burtt, Notes Roy. Bot. Gard. Edinburgh 24: 170. 1962; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 135. 1982. *Rhynchoglossum blumei* DC., Prodr. 9: 274. 1845. *Wulfenia obliqua* Wall., Tent. Fl. Nepal t. 35. 1826. *Loxotis obliqua* (Wall.) Benth., Scroph. Ind. 57. 1835. *Antonia obliqua* (Blume) R. Br., Pl. Asiat. Rar. 3: 65. 1832. *Rhynchoglossum obliquum* (Wall.) DC. *auct. non* Blume, Prodr. 9: 275. 1845. *Rhynchoglossum obliquum* Blume var. *parviflorum* C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5: 162. 1883. *Loxotis intermedia* Benth., Scroph. Ind. 57. 1835. *Rhynchoglossum obliquum* (Wall.) DC. var. *intermedium* (Benth.) DC., Prodr. 9: 275. 1845. *Rhynchoglossum rheedei* DC., Prodr. 9: 274. 1845. *Rhynchoglossum zeylanicum* W.J. Hooker, Bot. Mag. t. 4198. 1845. *Rhynchoglossum hologlossum* Hayata, Icon. Pl. Formosan. 5: 131. pl. 11. 1915. *Rhynchoglossum obliquum* Blume var. *hologlossum* (Hayata) W.T. Wang, Bull. Bot. Res., Harbin 4: 31. 1984. *Rhynchoglossum papuae* Schltr., Bot. Jahrb. 58: 299. 1923; B.L. Burtt, Notes Roy. Bot. Gard. Edinburgh 24: 171. 1962. **Fig. 22.**

English: Small Flowered Rhynchoglossum.



Figure 22. *Rhynchoglossum obliquum* Blume, flowering shoot.

Annual herbs. Stem up to 1.5 m tall, with swollen nodes, wrinkled or angular when dried, glabrous to sparsely puberulent. Leaves ovate to elliptic, 5-14 × 1.5-9.0 cm, base obliquely unequal, one side rounded to cordate, other side attenuate to cuneate, apex acuminate, margins entire or serrate, membranous, pale green, midrib puberulous, upper surface glabrous or sparsely hairy with gland dots, lower surface glabrous, young leaf brown pubescent; petiole terete, sparsely puberulous to glabrescent, 1-3 cm long. Inflorescences terminal and axillary leaf-opposed, 10-50 flowers cymes, 3-40 cm long, erect or pendulous, pubescent; peduncles 1-4 cm long; bracts linear or minute, puberulous, 2-10 mm long; pedicels 1-3 mm long, densely puberulous; bracteoles linear, 3-10 mm long, glabrous to puberulous. Flowers 8-12 mm long. Calyx tube campanulate, pale green to white, 3.0-5.5 × 1.5-3.0 mm, glabrous to glabrescent, connate at lower half, lobes 5, triangular, 1-2 mm long, acute or acuminate, white to transparent, margin entire to nearly serrate, puberulous. Corolla white, blue to dark purple or whitish blue, 0.8-1.6 × 0.4 cm, glabrous, pubescent; tube cylindric, 8-10 mm long; limb 6 mm long, upper lip emarginate or 2-lobed, 1-3 mm long; lower lip undivided, tongue-like, rounded to nearly trilobed, 3-6 mm long. Stamens 2; filaments 1-5 mm long; anthers ovoid to oblong, glabrous, basifixed; staminodes 2. Disc ca. 1 mm diameter. Ovary ovoid to oblong, 1.5-3.0 × 1 mm, glabrous; style glabrous, 5-10 mm long; stigma capitate. Fruit ovoid, 3-5 × 2-3 mm, glabrous, enclosed by persistent calyx. Seeds ellipsoid, 0.5 mm long. *Fl. & Fr.*: 7-11. *Forest margins, lowland secondary forests, cliffs, open area near stream; between 100-800 m altitudes.*

Sylhet: Jaintapur, 30.10.1935, GH Deka (ASSAM 21006).

Sri Lanka, India, Nepal, Myanmar, Thailand, Cambodia, Vietnam, China, Philippines, Indonesia, Malaysia to New Guinea.

Rhyncholechum Blume

Bijdr.: 775. 1826.

Type species: *R. parviflorum* Blume

Terrestrial undershrubs or herbs. Stems usually simple, occasionally sparingly branched, stout, brittle, bark white, spongy, young parts silky-wooly or hispid. Leaves simple, opposite or rarely alternate, petiolate, usually few, along stem, equal to subequal in a

pair; leaf blade surfaces sericeous to hirsute or woolly, often glabrescent, base attenuate to rounded. Inflorescences axillary, lax, few to many-flowered cymes; bracts 2, elliptic, opposite. Calyx actinomorphic, very deeply 5-lobed, segments equal, persistent. Corolla white to reddish or purple, zygomorphic, small, limb shallowly campanulate from a broad shallow tubular base, inside glabrous, limb 2-lipped, upper lip smaller than the lower; 5-lobed, lobes equal or subequal, apex rounded to obtuse. Stamens 4, adnate to corolla tube near base or rarely near middle, inserted, filaments short, curved; anthers basifixed, free, thecae parallel, confluent at apex, dehiscent longitudinally 2-celled, minutely glandular at the apex; connective not projecting; staminode absent or 1, adnate to adaxial side of corolla tube. Disk annular or obscure. Ovary conical to ovoid, 1-loculed; stigma 1, terminal, depressed globose, undivided; ovules enfolding, placentas 2, parietal, projecting inward, 2-cleft. Fruit a ovoid to globose berry, slightly longer than calyx, indehiscent, fleshy, white, translucent. Seeds small, ellipsoid, reticulate, unappendaged.

KEY TO THE SPECIES

- | | | |
|----|--|----------------------|
| 1. | Plant hispid, hairs stiff; calyx lobes distinctly caudate | R. vestitum |
| + | Plant woolly pubescent to sub-glabrous, not hispid; calyx lobes triangular to linear acuminate | 2 |
| 2. | Pedicels and calyx lobes often scabrous; ovary glabrous; style 6-7 mm long | R. ellipticum |
| + | Pedicels and calyx lobes sericeous or sub-glabrous; ovary glabrous to pubescent; style 3.5-4.0 mm long | R. hookeri |

Rhynchothecum ellipticum (Wall.) A. DC., Prodr. 9: 285. 1845; C.B. Clarke in Hook.f., Fl. Brit. India 4: 373. 1884; Prain, Beng. Pl. 2: 783. 1903 (Indian reprint 2004); Heinig, List Pl. Chitt. 48. 1925; Cowan & Cowan, Tree North Beng.: 96. 1929; Kanjilal *et al.*, Fl. Assam 3: 399. 1939 (reprint 1982); J. Sinclair, Fl. Cox's Bazar: 102. 1956; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 136. 1982; Alam, Bangladesh For. Res. Inst. Bull. Pl. Taxon. 5: 47. 1988; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 242. 2009. *Corysanthera elliptica* Wall. ex Dietrich, Syn. Pl. 3: 582. 1843. *Rhynchothecum obovatum* (Griff.) B.L. Burtt, Notes Roy. Bot. Gard. Edinburgh 24(1): 38. 1962. *Rhynchothecum latifolium* Hook.f. & Thoms. ex C.B. Clarke, Commelyn. Cyrtandr.

Bengal., pl. 94. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 4: 374. 1884; Kanjilal *et al.*, Fl. Assam 3: 400. 1939 (reprint 1982). *Chiliandra obovata* Griff., Notul, 4: 150. 1854.

Fig. 23.

Herbs or undershrubs. Stem up to 2 m tall, usually unbranched or sparingly branched, basally glabrescent, apically densely rust-brown woolly. Leaves opposite, deciduous on flowering parts of the stem; leaf blades oblanceolate to obovate or elliptic, 10-35 × 4-10 cm, apex acute to acuminate, base cuneate to attenuate, rarely nearly rounded, margins denticulate to serrulate, lateral nerves 10-20 pairs, upper surface glabrous to sparsely white pubescent, lower surface pale green, yellow-rusty woolly; petioles 1-5 cm long, appressed rust-brown to brown woolly. Inflorescence 15-70-flowered cymes, 3-8 cm long, fascicled, interspersed with much reduced leaves and bracts; peduncles 1-3 mm long, axes short yellow-rusty sericeous; bracts linear to triangular, 2-6 mm long; pedicels up to 1.5 mm long, hirsute. Calyx tube up to 1 mm long, lobes triangular to linear acuminate, 3-5 × 1.0-1.5 mm, outside brown woolly to pubescent, gland tipped, inside glabrous, pink to pale pink. Corolla red-purple or pink, scabrous with glandular hairs, tube 1.5-2.5 mm long; bilabiate, upper lip 3-4 × 4-5 mm, lower lip 5-7 × 7-8 mm. Stamens 4, inserted near the base of the corolla tube, 0.5-1.0 mm long; filaments short, curved; anthers 2-celled, purple, minutely glandular at the apex, staminode 1. Disk annular or obscure. Pistil 5-7 mm long, glabrous; ovary conical, 1-2 mm long; stigmas capitate. Fruit an ovoid berry, 3-5 × 3-5 mm, glabrous, white when ripe. *Fl. & Fr.*: 6-12. *Primary or secondary evergreen forests; between 100-500 m altitudes.*

Bandarban: Madeymrang, Sualock, 12 iii 2001, Mohiuddin & Sukla 8473 (BFRI). **Chittagong:** Rajarhat, 9 i 1934, C.E. Parkinson 3426 (GH, NY); Teknaf, 22 x 1963, M. S. Khan, 590 (DUSH); Hazarikhil, 1 xi 1978, AM Huq *et al.*, H4140 (DACB); Foy's Lake, 27 vii 1998, MMK Mia *et al.*, M 4100(DACB); Chunati, 22 i 1970, Range Officer sn (BFRI). **Moulvibazar:** Lawachara National Park, Kamalganj, 19 i 1965, MS Khan, K463 (DACB); 16 i 1979, MS Khan & MM Rahman, K5299 (DACB); 17 viii 2009, SN Uddin N3853 (DACB); 2 ii 2009, Bushra *et al.*, B1308 (DACB). **Rangamati:** Borkol, 27 iii 1876, J.L. Lister (CAL); Kaptai, 4 xii 1984, MK Alam 5310 (BFRI); Sitapahar, Kaptai, 26 x 1995, Mohiuddin & Mezan, 7581 (BFRI). **Sylhet:** 7.1820, F. De Silva, H. Bruce, W. Gomez, 6411 (K-000639675); August, 1832, N.Wallich, 6411 (K-000249994); 1832, N. Wallich, HI 6411 (K-000249995); Sylhet sadar, 24 v 1968,

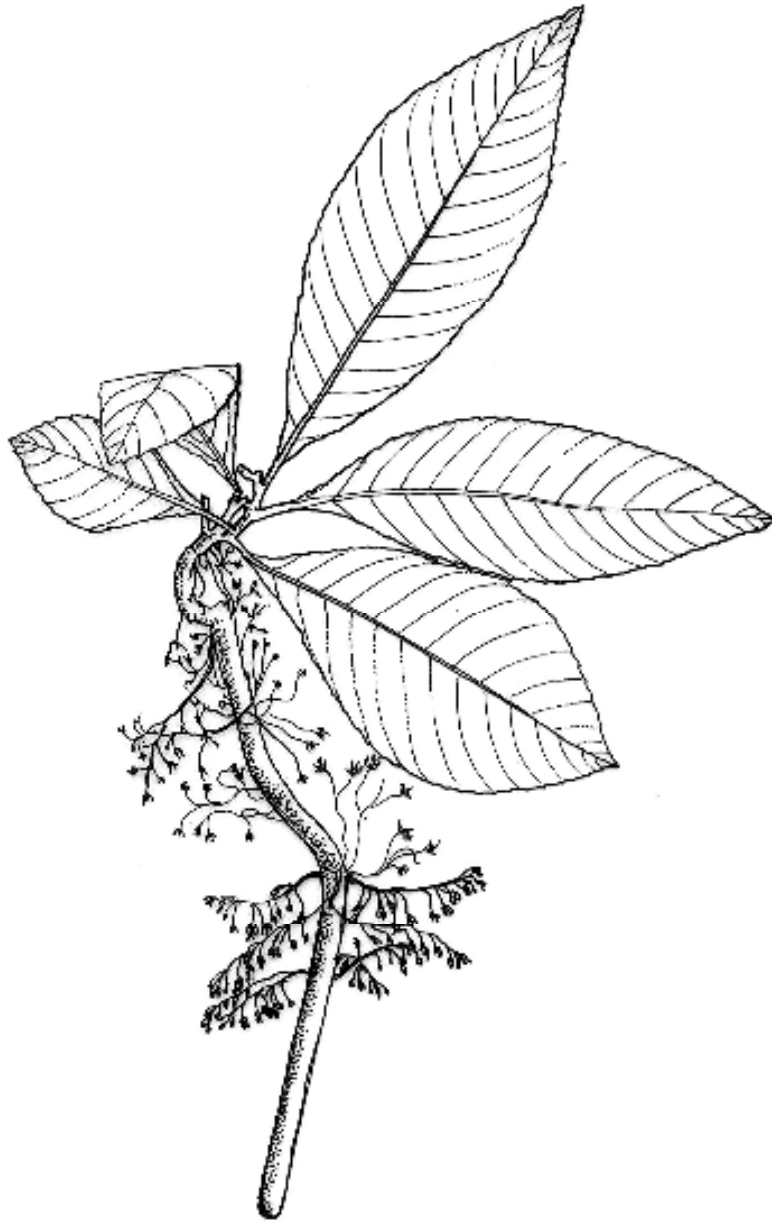


Figure 23. *Rhynchotechum ellipticum* (Wall.) A. DC., flowering shoot.

Paritosh, 174 (DUSH); 4 xii 1850, J.D. Hooker & T. Thomson s.n. (K); Tamabil, 24 v 1968, Gulnagar Hamid, 170 (DUSH); Jointiapur, 15 x 1986, AM Huq & MMK Mia, H7850 (DACB); Saltilla, 06 xii 1983, MK Alam 4838 (BFRI).

Bhutan, India, Nepal, Myanmar, Thailand, Vietnam, Cambodia, Laos, China and Malaysia.

Flowers and young leaves are eaten as vegetables and also used as medicine.

Rhyncholechum hookeri (C.B. Clarke) B.M. Anderson, Edinburgh J. Bot. 70(1): 152. 2013. *Rhyncholechum ellipticum* (Wall.) A. DC. var. *hookeri* C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 197. 1883. *Rhyncholechum ellipticum* (Wall.) A. DC. var. *angusta* C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 5(1): 197. 1883. **Fig. 24.**

Herbs or undershrubs, up to 1.5 m tall. Leaves opposite; petiole 1.5-4.0 cm long; leaf blade narrowly elliptic, 15-25 × 4-8 cm, base cuneate, apex acuminate, margins denticulate to entire, secondary nerves 15-20 pairs, upper surface dark green, glabrous to sparsely white pubescent, lower surface pale green, short rusty woolly, denser on the rusty veins. Inflorescence 1-3 cm long, 2-4-branched; peduncle reduced or absent; branches 2-5 mm long, axes rusty villous to sparsely hirsute; bracts linear to triangular, first bract 3-6 mm long, second bract 2.5-4.5 mm long; pedicels 3-10 mm long, sparsely rusty villous to sub-glabrous. Calyx pinkish, lobes triangular to linear-acuminate, 1.5-3.0 × 0.5-1.0 mm, sparsely villous to glabrous. Corolla pink-lilac, outside glabrous to sparsely puberulent; upper lip ca. 3 × 3 mm; upper lobes 1.2 × 1.2-1.5 mm, apices rounded to obtuse; lower lip 4.0-4.5 × 5-6 mm; lower lobes ca. 1.5 × 1.5-2.0 mm, apices rounded to obtuse; tube ca. 1.5 mm long. Stamens inserted near the base of the corolla tube; filaments ca. 1 mm long; anthers ca. 1 mm diameter, slightly puberulent with glandular hairs; staminode ca. 0.25 mm long. Ovary 1.0-1.2 × 1.2-1.3 mm, glabrous to slightly puberulent; style 3.5-4.0 mm long; stigma apex globose to truncate. Fruit ellipsoid to ovoid capsule, 2.5-3.0 × 2.0-2.5 mm, glabrous. *Fl. & Fr.*: 3-9. *Rain forests and woodlands; between 0-300 m altitudes.*

Chittagong: Chittagong sadar, 20 viii 1920, J.M. Cowan 923 (E); Hazarikhil, 30 x 1987, AM Huq & MMK Mia H8604 (DACB); Chunati Wildlife Sanctuary, 30 xii 1989, MS

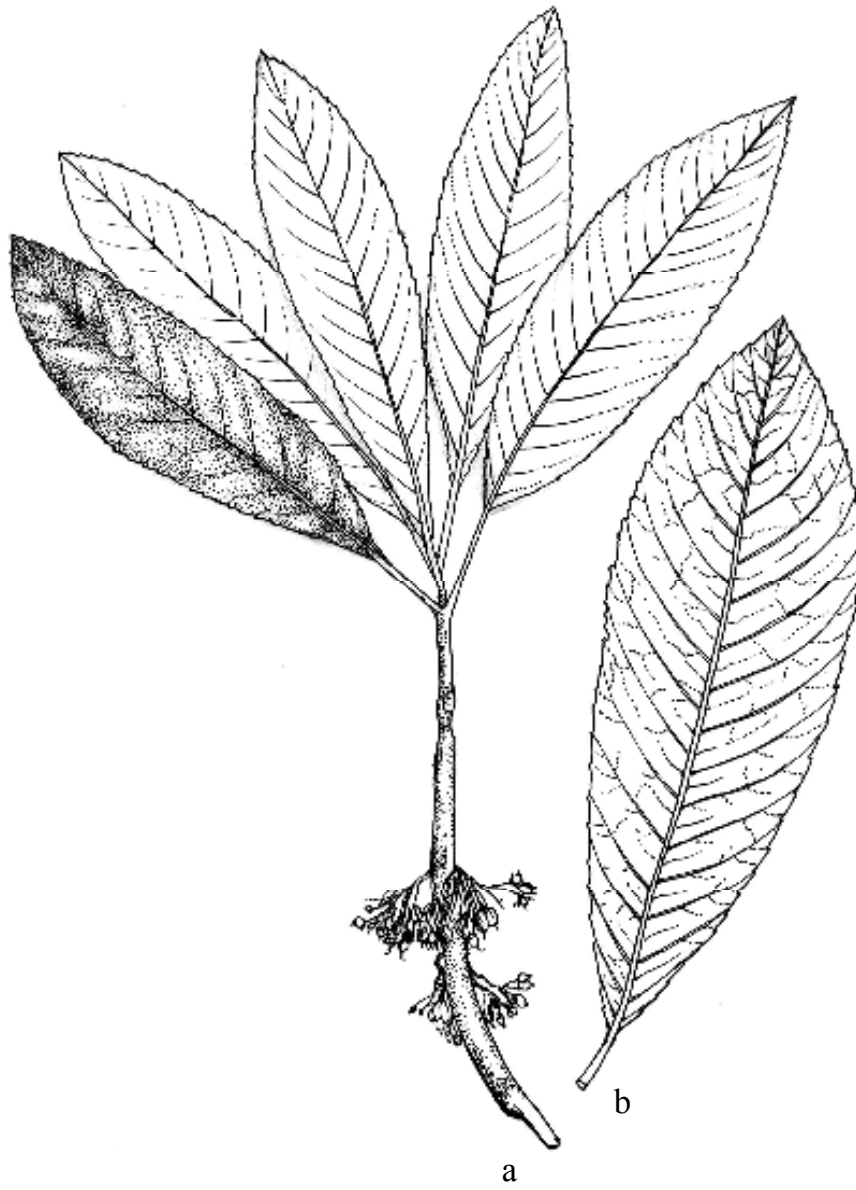


Figure 24. *Rhynchotechum hookeri* (C.B. Clarke) B.M. Anderson, a) flowering shoot; b) leaf showing reticulate venation.

Khan *et al*, K8185 (DACB). **Cox's Bazar**: Kalatali, 29 vii 1943, J. Sinclair 3083 (E); Teknaf, 25 xii 1996, MMK Mia M3682 (DACB); Teknaf, Howaikong Reserve Forest, 6 viii 1997, M.A. Rahman *et al*. 1727 (K). **Khagrachari**: Gomoti, Panchari, 22 iv 2011, SN Uddin N4680 (DACB). Moulvibazar: Madhabkundo, Barolekha, 25 vi 2001, SN Uddin N1090 (DACB). **Rangamati**: Barkal, 27. 03. 1876. J.L.Lister (CAL 371718); Barkal, iii 1880, J.S. Gamble 7837 (K); Sitapahar, ix 1920, J.M. Cowan 1336 (E); Sitapahar, Kaptai, 6 ix 2000, MS Khan & MMK Mia K10633 (DACB); 22 ix 2002, SN Uddin N1414 (DACB); Rampahar, Kaptai, 30 ix 2002, SN Uddin N1696 (DACB); 16 v 2003, SN Uddin N2055 (DACB); Pharu Reserve Forest, 14 x 2008, SN Uddin N 2997 (DACB); 21 vii 2009, SN Uddin N3727 (DACB); 18 i 2009, Bushra *et al*, B1280 (DACB).

India and Myanmar.

Rhynchotechum vestitum (Griff.) Wall. *ex* C.B. Clarke, Commelyn. Cyrtandr. Bengal. 132, pl. 92. 1874; C.B.Clarke in A.DC. & C.DC., Monogr. Phan. 5(1): 197. 1883; C.B. Clarke in Hook.f., Fl. Brit. India 4: 373. 1884; W.T.Wang *et al*. in C.Y. Wu & P.H. Raven (eds), Fl. China 18: 395. 1998; Hilliard in Grierson & D.G.Long, Fl. Bhutan 2(3): 1326. 2001. *Corysanthera vestita* Griff., Itin. Pl. Khasyah Mts. 124. 1848. *Rhynchotechum hispidum* C.B. Clarke in A.DC. & C.DC., Monogr. Phan. 5(1): 197. 1883. **Fig. 25.**

Undershrubs. Stems 60-150 cm tall, sometimes decumbent and rooting at nodes. Leaves opposite; petiole 2-7 cm long; blade elliptic to narrowly elliptic, 5-28 × 2-12 cm, apex acuminate or acute, base narrowly cuneate to cuneate; margin denticulate to sub-entire, lateral nerves 8-19 pairs, upper surface dark green, long rusty-yellow appressed hispid, lower surface pale green, long yellow-rusty appressed hispid, denser on the reddish-brown veins. Inflorescence 1-5 cm long, 2-4-branched; peduncle reduced or absent; axes densely yellow hispid; bracts triangular to linear, bract 5-16 mm long; pedicels 4-14 mm long, densely hispid. Calyx whitish to greenish, lobes triangular, 4-6 × 1-2 mm, densely long hispid. Corolla pink to white, exterior glabrous; upper lip 3-4 × 4-6 mm; upper lobes 1.5-2 × 2-2.5 mm, apices rounded to obtuse; lower lip 5-6 × 6-8 mm; lower lobes 2-3 × 1.5-3 mm, apices rounded to obtuse; tube 1.5-2 mm long. Stamens inserted in the corolla tube, slightly didynamous; filaments 1.0-1.3 mm long; anthers 1.0-1.5 mm

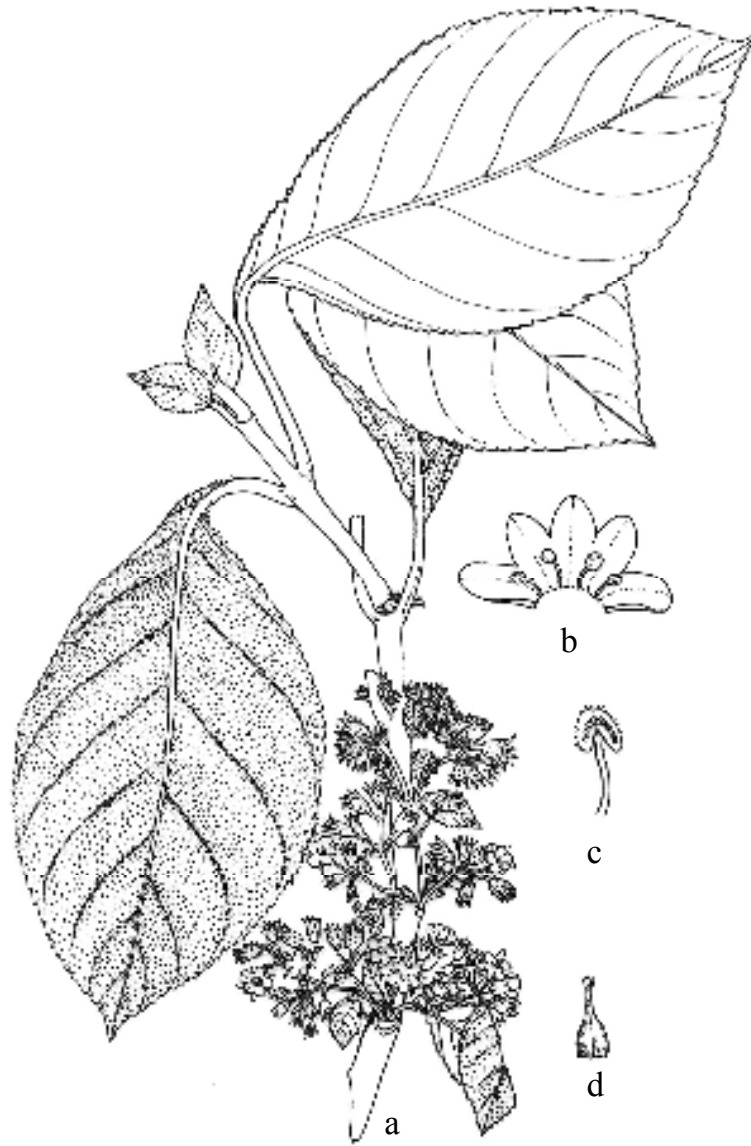


Figure 25. *Rhynchotechum vestitum* (Griff.) Wall., a) flowering shoot; b) opened corolla; c) stamen; and d) pistil.

diameter, puberulent with glandular hairs; staminode 0.25-0.5 mm long. Ovary 1.0-1.5 × 1-2 mm, puberulent; style 2-4 mm long; stigma truncate to globose. Fruit ovoid, 3-4 × 3-4 mm, glabrous to slightly puberulent. *Fl. & Fr.*: 3-9. *Growing in rainforests, damp and shady conditions, sometimes in ravines; between 400-1000 m altitudes.*

East Bengal: locality & date unknown, W.Griffith, 3849 (CAL-331318).

India, Bhutan, China, Vietnam, Sumatra and Java.

Stauranthera Benth.

Scroph. Ind.: 57. 1835.

Type species: *S. grandifolia* Benth.

Perennial or annual, monocarpic, terrestrial herbs. Stem fleshy-succulent, often simple, occasionally sparingly branched, hispid. Leaves few, along stem, alternate or opposite, strongly unequal, one of each pair reduced to a small auricle; the larger leaves with short or long petiole; leaf blade elliptic to ovate, base strongly unequal-sided, oblique, cuneate to rounded, apex acute-acuminate or blunt, glabrescent to sparsely puberulent; petiolate. Inflorescence lax, pseudoterminal, few to many flowered paniculate cymes or subracemose or single-flowered cymes or solitary flowers emerging from small bracts; bracts 2, small, elliptic, opposite. Flowers pedicellate. Calyx actinomorphic, widely campanulate, deeply 5-lobed, wide spreading, plicate between adjoining lobes; lobes equal. Corolla 5-merous, white, blue, or purple, zygomorphic, tube campanulate, inside glabrous, spurred or gibbous at base, limb indistinctly 2-lipped; adaxial lip 2-lobed, nearly as long as abaxial lip; abaxial lip 3-lobed, lobes equal or subequal, apex rounded. Stamens 4, all fertile, adnate to corolla tube near base, inserted; filaments short, curved; anthers basifixed, 2-celled, coherent laterally to form a shallow cone, thecae slightly divergent, confluent at apex, dehiscent longitudinally; connective not projecting. Disk absent or obscure. Ovary sessile, subglobose, 1-loculed; styles short; stigmas capitate, broadly funnelform, undivided; placentae deeply inflexed, bifid, bearing ovules on both sides. Fruits capsular, depressed-globose, overtopped by the calyx, dehiscent transversely or irregularly. Seeds very small, blackish-brown, obovoid, smooth, testa reticulate, unappendaged.

KEY TO THE SPECIES

1. Leaves opposite; peduncles 4-7 cm long; corolla 25 mm long, **S. grandifolia**
blue, spurred at the base
- + Leaves alternate; peduncles less than 4 cm long; corolla 6-8 **S. umbrosa**
mm long, white with blue marks, gibbous at the base.

Stauranthera grandifolia Benth., Scroph. Ind. 57. 1835. *Stauranthera grandiflora* Benth., Scroph. Ind. 57. 1835; C.B. Clarke in Hook.f., Fl. Brit. India 4: 371. 1884; Prain, Beng. Pl. 2: 785. 1903 (Indian reprint 2004); Heinig, List Pl. Chitt. 48. 1925; J.Sinclair, Fl. Cox's Bazar: 102. 1956; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 243. 2009. **Fig. 26.**

Annual herbs, up to 30 cm tall, usually unbranched, succulent, dusky-pubescent. Leaves simple, opposite, falcate, elliptic, 18-25 × 8-12 cm, apex acute to acuminate, base cuneate, margin obscurely dentate, glabrous above, grey-pilose beneath or at least on the nerves, very unequal sided, petioles 0.5-2.5 cm long. Inflorescence paniculate cymes, terminal or rarely axillary, 5-15 cm long, peduncles 4-7 cm long; pedicels up to 1.5 cm long, both hirsute. Calyx tube widely campanulate, up to 0.8 cm long, 5-lobed, lobes half way down, triangular, 3-5 × 1.0-1.5 mm, hirsute, green. Corolla campanulate, 0.8-1.0 cm long, spurred, 2-3 mm long, blue with yellow mark inside tube. Stamens 4, inserted near the base of tube, filaments short, curved, anthers 2-celled, minutely glandular at the apex, staminode 1. Disk annular or obscure. Ovary sessile, subglobose, pubescent or glabrous, styles short, stigmas broad. Fruits capsular, depressed globose, 4-5 × 3-4 mm, dehiscent irregularly. Seeds minute, obovoid, smooth. *Fl. & Fr.*: 5-9. *Primary or secondary moist evergreen tropical forests, up to an altitude of 500 m.*

Moulvibazar: Lathitilla, Juri, 11 ix 2014, KK Islam K-I63 (DACB). **Rangamati:** Thandachari, Sitapahar, 26 x 1995, Mohiuddin & Sukla 7584 (BFRI).

India, Myanmar, China, Vietnam, Thailand, Peninsular Malaysia and Indonesia.



Figure 26. *Stauranthera grandifolia* Benth., a) flowering shoot; b) flower.

Stauranthera umbrosa (Griff.) C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 89. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 4: 371. 1884; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 244. 2009. *Cyananthus umbrosus* Griff., Not. Pl. Asiat. 4: 154. 1854. **Fig. 27.**

Annual herbs, up to 35 cm tall, occasionally branched, dusky-pubescent. Leaves simple, alternate, falcate, ovate to obovate, elliptic, 12-20 × 6-8 cm, apex acute to acuminate, base strongly oblique, cuneate to rounded, margin obscurely repand-crenate, glabrescent to glabrous above, fuscous-pubescent beneath or at least on the nerves; reduced leaves sessile, oblique, obovate, 3-4 mm; petioles 0.6-1.3 cm long. Inflorescence uniparous cymes, terminal, 5-8 cm long; peduncles 1.8-3.5 cm long, dusky-pubescent; bracts linear, 3-4 mm, adaxially puberulent; pedicels 0.6-1.2 cm long, both hirsute. Calyx tube widely campanulate, up to 0.8 cm long, 5-lobed, lobes half way down, broadly triangular, 3-5 × 1.0-1.5 mm, hirsute, green. Corolla campanulate, 0.8-1.5 cm long, gibbous, tube 2.2-2.8 × 3-4 mm; adaxial lip 3-4 mm wide, abaxial lip ca. 4-5 mm wide, white with blue marks outside or white to purple, base of the inside tube yellow. Stamens 4, inserted near the base of tube, 3-5 mm long, filaments short, curved, anthers 2-celled, minutely glandular at the apex, staminode 1. Disk annular or obscure. Pistil 1.8-2.0 mm long; ovary sessile, subglobose, densely puberulent, styles short, stigmas broad. Fruits capsular, depressed globose, 4-6 × 3.5-4.5 mm, depressed globose with persistent style, overtopped by the calyx. Seeds minute, obovoid, smooth. *Fl. & Fr.*: 7-12. *Primary or secondary, evergreen tropical forest margins in valleys; between 300-700 m altitudes.*

Chittagong: Dhopachari, Dohazari, 11 vi 2001, SN Uddin N-995 (DACB). **East Bengal:** locality & date unknown, W. Griffith, 3849 (CAL-331789). **Rangamati:** Sitapahar, Kaptai, 26 ix 2002, SN Uddin N-1605 (DACB); 17 iv 2001, Sitapahar, Kaptai, SN Uddin N-1782 (DACB); 2 x 2002, Rahpahar, Kaptai, SN Uddin N-1782 (DACB); 28 v 2003, SN Uddin N-1867 (DACB).

India, Myanmar, Thailand, Malaysia, Vietnam and China.

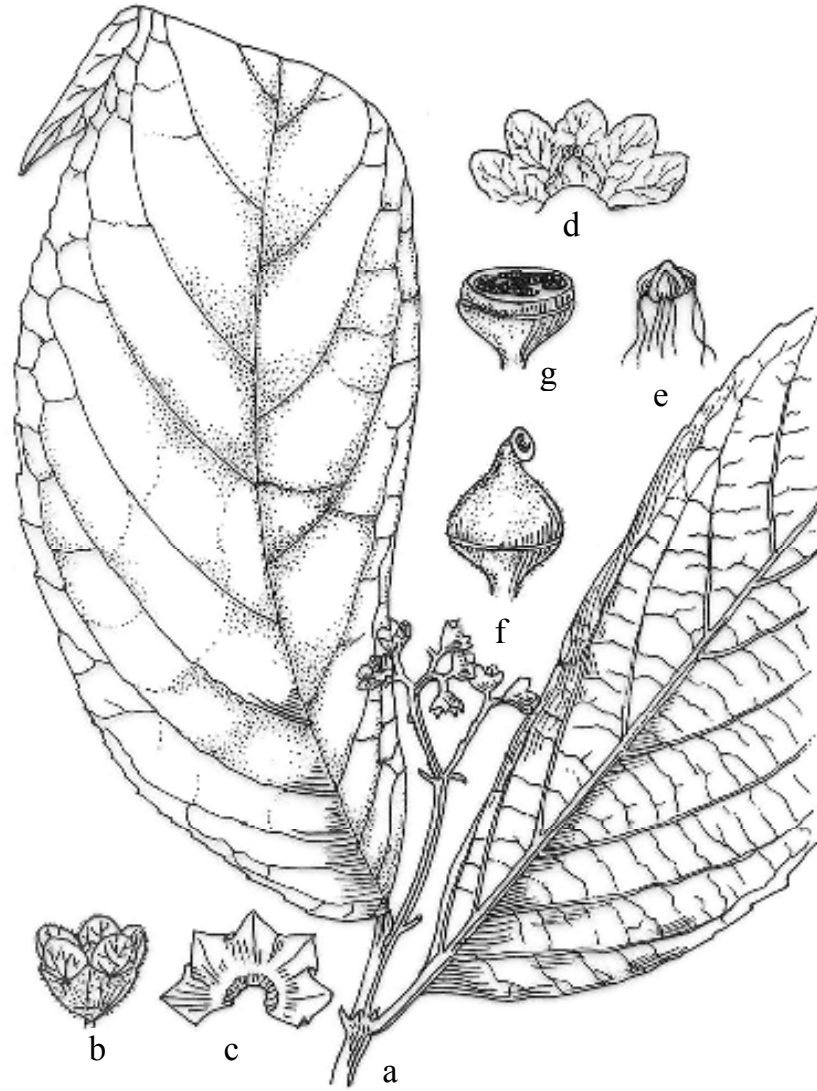


Figure 27. *Stauranthera umbrosa* (Griff.) C.B. Clarke, a) flowering shoot; b) flower; c) opened calyx; d) opened corolla with stamens; e) stamen; f) pistil; and g) capsule.

Tetraphyllum Griff.

Notul. 4: 148. 1854.

Type species: *T. bengalense* C.B. Clarke

Perennial, monocarpic herbs. Stems erect, caulescent, tawny-villose, bearing a tetramerous pseudowhorled or a single leaf pair at the top and pairs of scale leaves. Leaves simple, petiolate or sessile; leaf blades ovate or lanceolate, unequal sided. Inflorescence densely cymose or subcapitate, sessile or nearly so; bracts elliptic; flowers nearly sessile; bracteoles small. Sepals 5, almost free to base. Corolla widely funnel-shaped, silky hairy, pink or blue, limb bilabiate or subregular; lobes 5, subequal, ovate, obtuse. Stamens 4, didynamous, or 2; filaments adnate to corolla base; anthers coherent at the tips, opening by longitudinal slits; staminodes 3, smaller. Disk cylindrical or absent. Ovary ovoid, styles linear, stigmas obscurely 2-lobed, placentae deeply intruded, 2-partite, revolute, bearing ovules on both sides. Fruits capsular, narrowly lanceolate, loculicidally dehiscent into 4 valves, leaving the two main ribs united to the persistent style base. Seeds small, ellipsoid, testa lax, reticulate.

Tetraphyllum bengalense C.B. Clarke, Monogr. Phan. 5: 137. 1883; C.B. Clarke in Hook.f., Fl. Brit. India 4: 363. 1884; Prain, Beng. Pl. 2: 784. 1903 (Indian reprint 2004); Heinig, List Pl. Chitt. 48. 1925; Uddin in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 8: 245. 2009. **Fig. 28.**

Annual herbs. Stem up to 40 cm tall, tawny-villous, lower part leafless. Leaves 2 pairs at the top, simple, pseudowhorled; lamina ovate-elliptic or elliptic, 15-18 × 8-10 cm, membranous, apex acute, base cuneate, unequal-sided, margin crenate, glabrous above, dusky villous beneath or at least on the nerves, nerves 8-12 pairs, petioles 8-10 mm long or longer. Inflorescence sub-terminal or axillary, 10 to 30-flowered cymes; peduncles 4-6 cm long; pedicels 0.4-0.6 cm long, pubescent. Calyx very deeply divided, segments lanceolate, 1.2-1.7 mm long, fulvous silky hairy. Corolla tube funnel-shaped, 14-16 mm long, blue, glabrous, lobes 5, ovate, 6-8 mm long, subequal. Fertile stamens 2, glabrous, filaments short, anthers sub-mucronate at the apex, 2-celled, cells ellipsoid, parallel, dehiscent by longitudinal slits, staminodes 3, smaller. Disk cylindrical or absent. Ovary ellipsoid, covered with silky hairs, styles linear, stigmas obscurely 2-lobed, placentae deeply intruded, 2-partite, revolute, bearing ovules on both sides. Fruits capsular,

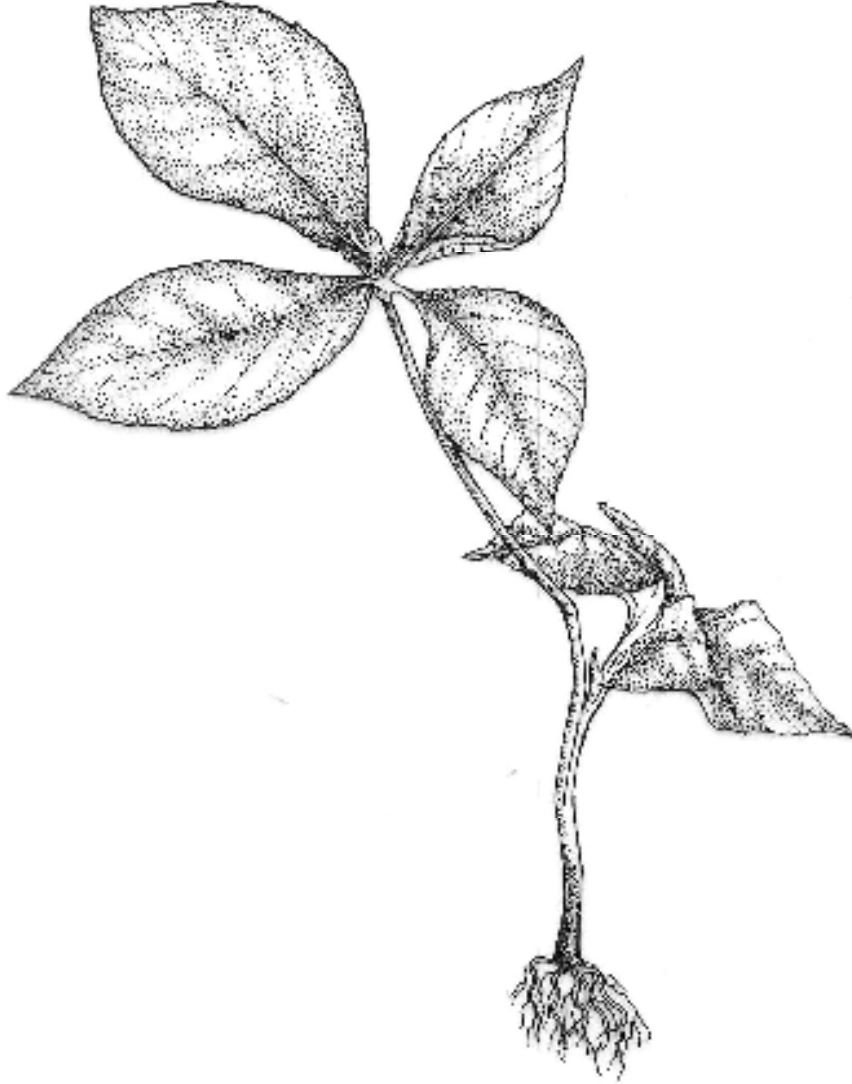


Figure 28. *Tetraphyllum bengalense* C.B. Clarke, a flowering plant.

narrowly lanceolate, 1.2-1.6 × 0.2-0.3 cm, acute, loculicidally dehiscent into 4 valves. Seeds small, ellipsoid, testa lax, reticulate. *Fl. & Fr.*: 6-10. *Shady banks and rock-faces in the forests, between 300 to 1000 m altitudes.*

East Bengal: locality & date unknown, W. Griffith, 3830 (CAL-332031). **Moulvibazar:** Lathitilla Forest Beat, Juri, 22 ix 2014, SN Uddin & MEH Khokan N5614 (DACB). **Rangamati:** Kassalong, 13 ii 1873, CB Clarke, 19814A (K-000901027).

India, Myanmar and Bhutan.

The leaves are used for fomenting in case of swellings and pain on the ankle and wrist.

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