

FLORA OF BANGLADESH

No. 66

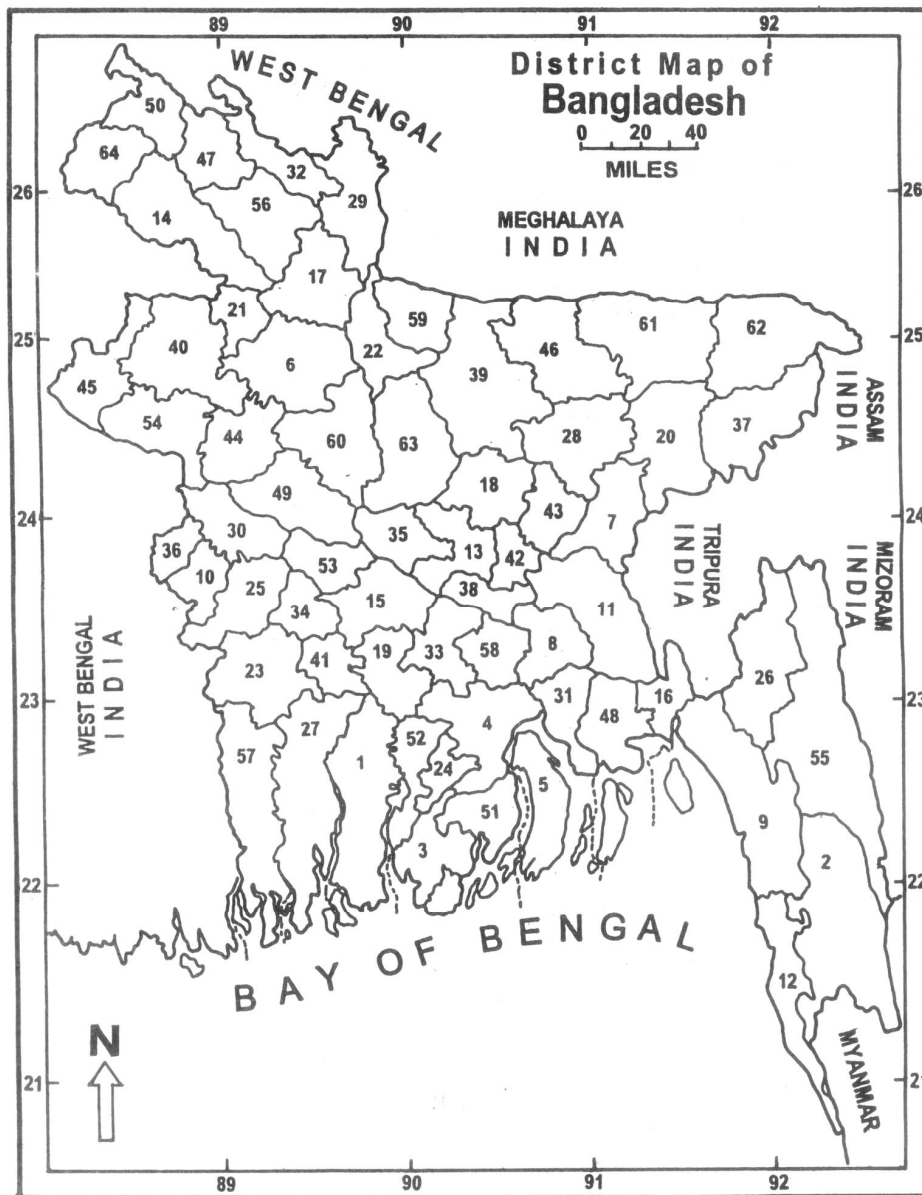
URTICACEAE

**EDITORS
HOSNE ARA
And
BUSHRA KHAN**

June 2016

**By
SARDER NASIR UDDIN
AND
SHAYLA SHARMIN SHETU**

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



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
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14.	Dinajpur	46.	Netrakona
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18.	Gazipur	50.	Panchagarh
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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

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URTICACEAE A.Juss. (Including Cecropiaceae C.Berg)

Sarder Nasir Uddin and Shayla Sharmin Shetu

Monoecious or dioecious herbs, subshrubs, or shrubs, rarely trees, very rarely climbers. Stems often fibrous, sometimes succulent, sometimes armed with stinging hairs; epidermal cells of leaves, stems, perianths mostly with prominent cystoliths punctiform to linear. Leaves simple, alternate or opposite, stipulate, rarely exstipulate, petiolate. Inflorescences axillary, cymose, paniculate raceme, spicate, or cluster-capitate, usually formed from glomerules, sometimes crowded on common receptacle, rarely solitary. Flowers minute, unisexual, rarely bisexual, usually green, actinomorphic, hypogynous, 4- or 5-merous, rarely perianth absent in female flowers. Perianth 1-whorled, tepals usually 3-5, occasionally 1, 2 or absent, free or connate, imbricate or valvate, persistent. Male flowers: stamens usually 3-5, opposite to tepals, or reduced to 2 or 1, filaments inflexed in bud, anthers 2-celled, dorsifixed, dehiscent longitudinally, rudimentary pistillode usually present. Female flowers: perianth lobes free or connate, usually enlarged in fruit and persistent, occasionally absent; staminodes scarious, opposite to the perianth lobes, or absent; ovary superior, sessile or shortly stipitate, unilocular, with one basal ovule, style 1 or absent, simple, stigmas diverse, capitate, mostly penicillate, subulate, filiform, ligulate, or peltate. Fruit an achene or a small nut, or rarely a fleshy drupe, often enclosed by a persistent, accrescent perianth. Seeds solitary with membranous testa, endosperm usually present, embryo straight; cotyledons ovate elliptical or orbicular.

The family Urticaceae consists about 47 genera and 1300 species, widely distributed in tropical and subtropical regions. In Bangladesh, this family is represented by 16 genera and 48 species.

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Abbreviations used in the text

CAL = Central National Herbarium, Kolkata

BFRI = Bangladesh Forest Research Institute Herbarium

DACB = Bangladesh National Herbarium

DUSH = Dhaka University Salar Khan Herbarium

K = The Royal Botanic Gardens Kew Herbarium

KEY TO THE GENERA

- | | |
|--|-----------------------|
| 1. Woody climbers; filaments of stamens erect in bud | Poikilospermum |
| + Herbs, shrubs or trees; filaments of stamens inflexed in bud | 2 |
| 2. Plants armed with stinging hairs; female flowers without staminodes | 4 |
| + Plants without stinging hairs; female flowers with or without staminodes | 6 |
| 3. Leaves opposite; perianth lobes of female flowers free | Urtica |

- | | |
|--|--------------------|
| + Leaves alternate; perianth lobes of female flowers connate | |
| 4. Robust herb with longest stinging hairs more than 5 mm long; female perianth with 3 lobes fused and the 4th absent or reduced to a bristle | Girardinia |
| + Woody shrubs or trees or herbs with longest stinging hairs less than 5 mm long; female perianth lobes 4, dorsal lobe largest, ventral lobe smallest, joined at base only, never bristlelike | 5 |
| 5. Trees or shrubs; stipules completely joined, apex entire; pedicels of female flowers absent terete, not winged in fruit | Dendrocnide |
| + Herbs or subshrubs; stipules 2-fid at apex; pedicels of female flowers always present, winged in fruit | Laportea |
| 6. Cystoliths usually linear or fusiform; stigma sessile, penicillate-capitate; perianth lobes of female flowers free or connate at base, staminodes present | 7 |
| + Cystoliths dotlike or botuliform; stigma often on a style, mostly linear, less often penicillate-capitate; perianth lobes of female flowers usually connate into a tube, rarely strongly reduced, or absent, staminodes absent | 9 |
| 7. Leaves opposite, rarely spirally alternate and then leaf blade peltate; leaf blade usually symmetric | Pilea |
| + Leaves alternate or very strongly heterophyllous with 1 leaf of the pair reduced to a nanophyll very much smaller than the other, leaves usually distichous; leaf blade usually asymmetric | 8 |
| 8. Perianth lobes of female flowers usually 4 or 5, much shorter than ovary, or strongly reduced, not corniculate at apex; achene 6-10-ribbed; male inflorescences usually with receptacle, rarely cymose; female inflorescences with discoid receptacle and bracteoles along margin | Elatostema |
| + Perianth lobes of female flowers 3-5, longer than ovary, usually corniculate below apex; achene tuberculate or striate, rarely smooth, never ribbed; male inflorescences cymose; female inflorescences cymose or capitulate on globose receptacle | Pellionia |
| 9. Leaves opposite | 10 |
| + Leaves alternate | 14 |
| 10. Leaf margin entire | 11 |
| + Leaf margin serrate or dentate | 12 |

- | | |
|---|---------------------|
| 11. Male buds truncate, perianth with annular, often villous, crown formed from transverse crests of lobes; leaf blade 3-veined from base | Gonostegia |
| + Male flowers without this combination of characters; leaf blade with at least 2 major lateral veins arising clearly above base | Pouzolzia |
| 12. Fruiting perianth present, enclosing the achene | 13 |
| + Fruiting perianth absent | Phenax |
| 13. Achene not lustrous, remaining attached to perianth; stigma persistent | Boehmeria |
| + Achene lustrous, easily detached from perianth; stigma usually deciduous | Pouzolzia |
| 14. Stigma filiform or ligulate | 15 |
| + Stigma penicillate, peltate or ringlike | 17 |
| 15. Staminate flowers 2-merous; flower-clusters arranged along slender leafless unbranched spike-like axes | Neodistemon |
| + Staminate flowers 3–5-merous; flower-clusters variously axillary or along branched or unbranched axes | 16 |
| 16. Leaf blade 3-veined arising clearly from base; male buds truncate, perianth with annular, often villous, crown formed from transverse crests of lobes | Gonostegia |
| + Leaf blade with at least 2 major lateral veins arising clearly above base; male flowers without the combination as above | Pouzolzia |
| 17. Inflorescence elongated with short lateral branches, all axes completely hidden by very closely spaced flowers; stigma ringlike | Sarcochlamys |
| + Inflorescence globose or nearly so or, if more elongated and branched then axes exposed between discrete glomerules of flowers; stigma peltate or penicillate | 18 |
| 18. Stigma peltate with long ciliate hairs along margin; achene with fleshy receptacle | Oreocnide |
| + Stigma penicillate; achene without fleshy receptacle | Debregeasia |

Boehmeria Jacq., Enum. Pl. Carib.: 9.1760.

Type species: *Boehmeria ramiflora* Jacq.

Monoecious or dioecious, small trees, shrubs or subshrubs, or perennial herbs, without stinging hairs. Leaves alternate or opposite, petiolate, stipules deciduous, intrapetiolar, free or rarely connate at base, leaf blade unequal, simple, rarely 2- or 3-lobed, chartaceous, margin dentate or serrate, 3-veined, cystoliths punctate. Inflorescence of an axillary glomerule, on normal leafy stems or on specialized, slender, shoots, or spikelike to panicle-like; bracts and bracteoles small, scarious. Flowers unisexual, or less often bisexual. Male flowers: perianth 3-5 lobed or parted, segments valvate; stamens (3 or) 4 or 5; filaments inflexed in bud; rudimentary ovary clavate or subglobose. Female flowers: perianth tubular-lageniform, compressed, sometimes ventricose, mouth often contracted, 2-4 toothed, in fruit sometimes enlarged and dilated into 2 acute angles or wings; staminode absent; ovary inserted in the perianth, sessile or stipitate, mostly free, stigmas filiform, pilose on 1 side, persistent, ovules erect. Achenes enclosed in persistent, scarious or membranous perianth. Seeds with copious endosperm; cotyledons elliptic or ovate.

KEY TO THE SPECIES

- | | | |
|----|--|-------------------------|
| 1. | Glomerules all axillary on normal leafy branches | 2 |
| + | Glomerules all or partly arranged on specialized slender flowering branches | 4 |
| 2. | Petiole long (2.5-10.0 cm); leaf beneath without white hair | B. glomerulifera |
| + | Petiole short (up to 2.5 cm); leaf beneath covered with white hairs | 3 |
| 3. | Bark rough, brownish; leaf linear-lanceolate; margin coarsely serrate | B. manipuriensis |
| + | Bark soft, whitish; leaf elliptic-lanceolate; margin finely serrulate | B. aspera |
| 4. | Flowering shoots with tuft of foliage leaves at apex | B. clidemioides |
| + | Flowering shoots without tuft of leaves at apex | 5 |
| 5. | Leaves alternate; flowering shoots branched | B. nivea |
| + | Leaves opposite; flowering shoots usually unbranched, sometimes loosely branched at base | 6 |



Figure 1. *Boehmeria aspera* Wedd.: a) Flowering shoot.

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|----|--|------------------------|
| 6. | Leaf blade lanceolate or linear-lanceolate | B. penduliflora |
| + | Leaf blade ovate or suborbicular, rarely sublanceolate | 7 |
| 7. | Herbs or subshrubs; leaf blade ovate, patent pubescent abaxially | B. macrophylla |
| + | Shrubs; leaf blade narrowly ovate to lanceolate, strigillose abaxially | B. hamiltoniana |

Boehmeria aspera Wedd., Arch. Mus. Paris 9: 349. 1856. *Boehmeria aspera* (Wedd.) Blume, Mus. Bot. 2 (13): 206. 1857. *nom. illeg.* Uddin *et al.*, Bull. Bangladesh National Herb., 4: 2. 2015. *Boehmeria diversifolia* Wedd., Ann. Sci. Nat. 4 (1): 202. 1854, not Miq., 1851. *Boehmeria pavonii* var. *diversifolia* Wedd. in DC. Prodr. 16, pt. 1: 199. 1869, in part. *Pouzolzia aspera* (Wedd.) Wedd., Prodr. Syst. Nat. Reg. Veg. 16 (1): 233. 1869. *nom. illeg.* *Margarocarpus asper* Wedd., Ann. Sci. Nat. Bot., sér. 4, 1: 204. 1854. **Fig. 1.**

Monoecious shrubs up to 5 m tall, leafy internodes 3-20 (40) mm long, 0.8-4 mm thick, densely sericeous with appressed ascending whitish hairs 0.2-0.7 mm long; stipules 4-10 mm long, 1-2 mm broad at the base, sparsely puberulent, often persisting at the base of the inflorescences. Leaves alternate; petioles 1-23 mm long, minutely hirsutulous; leaf blades usually of 2 different sizes at adjacent nodes, the smaller one ovate, 1-3 × 0.8-1.5 cm, acute, sessile; the larger one lanceolate to very narrowly elliptic, 4-18 × 1.0-3.5 cm, tapering gradually to a long acuminate apex, obtuse to rounded at the slightly unequal base, margins finely serrulate, lamina drying stiffly chartaceous, slightly scabrous and strongly rugose with the veins deeply impressed above, lower surface densely puberulent with stiff slender whitish hairs 0.2-0.8 mm long, venation palmate with 3 primary veins, midvein with many small secondaries or with 1 or 2 pairs of more prominent secondary veins in the distal half. Inflorescences usually unisexual, the flowers numerous and clustered in dense glomerules 4-10 mm in diameter in the axils of leaves or at leafless nodes. Staminate flowers more than 20 per glomerule, densely crowded, sessile or pedicellate; perianth 4-parted, stamens 4, anthers about 0.5 mm long. Pistillate flowers densely crowded, more than 20 per inflorescence, bracts not usually visible between the flowers, pistil about 2 mm long, style often with a slender glabrous portion below the long puberulent stigmatic part. Fruit enclosed within the persisting perianth-tube, perianth-tube about 1 mm long with erect hairs distally. *Fl. & fr.*: 1-12. *Tropical rain forests, along streams; between 200-700 m altitude.*

Holotype: Colombia, *Goudot s.n.* 1844.



Figure 2. *Boehmeria clidemioides* Miq.: a) Flowering shoot; b) Male flower; c) Achene.

Rangamati: Pharus reserved forest, Bilaichari, 15 x 2008, *S.N.Uddin et al.*, N-3069 (DACB).

Peru, Costa Rica, Colombia, Ecuador and Panama.

Boehmeria clidemioides Miq., Pl. Jungh. 1: 34. 1851. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 201. 1982; Uddin *et al.*, Bull. Bangladesh National Herb. 4: 3. 2015. *Boehmeria clidemioides* var. *diffusa* (Wedd.) Hand.-Mazz., Symb. Sin. 7: 152. 1929. *Boehmeria diffusa* Wedd., Arch. Mus. Hist. Nat. 9: 356. 1856; Cowan & Cowan, Tree North Beng.: 128. 1929; Kurz, Forest Fl. Brit. Burma 2: 422. 1877 (Repr. 1974). *Boehmeria sidifolia* Wedd., Ann. Sc. Nat. Ser. 4 (1): 203. 1854; Hook.f., Fl. Brit. India 5: 576. 1888 (Indian repr. 1954); Brandis, Indian Trees 617. 1906. **Fig. 2.**

Perennial, dioecious herbs or subshrubs, diffuse or erect, much branched, up to 1.5 m tall; branchlets strigose, without stinging hairs. Leaves alternate or sometimes opposite in lower part of stems, unequal in size; leaf blade variable in shape and size, ovate, narrowly ovate, or sublanceolate, 4-14 × 2-7 cm, base often broadly cuneate, apex acuminate or caudate, margins coarsely 7-13-dentate from basal one third, papery or herbaceous, 3-nerved, secondary nerves 2 or 3 pairs along midrib, lower surface spreading-pilose, appressed pubescent along midrib and lateral nerves, upper surface strigose, often rough, cystoliths punctiform; stipules deciduous, intrapetiolar, free, lanceolate, 6-8 mm long; petiole 2-9 cm long, pubescent. Inflorescence an axillary glomerules, unisexual, on specialized axillary branches, usually unbranched, rarely with a few lateral branches at their base, often with a tuft of 2-4 small foliage at the apex. Glomerules 2-4 mm in diameter. Male flowers 4-merous, sessile, perianth lobes ca. 1.5 mm long, valvate, connate at base, sparsely puberulent; stamens (3 or) 4; filaments inflexed in bud; rudimentary ovule ellipsoid, ca. 0.5 mm. Female flowers: perianth tubular, usually compressed, apex 2-4-toothed, enlarged and dilated into 2 acute angles or wings in fruit; staminodes absent; ovary included; stigma filiform, on a style, pilose on one side, usually persistent for some time; ovule orthotropous. Achene enclosed by marcescent perianth, fruiting perianth base often obtuse, compressed, ca. 1.5 mm long, strigose on shoulder, apex 2-toothed. Seed with endosperm; cotyledons elliptic or ovate. $2n = 28$ (Kumar & Subramaniam, 1986). *Fl. & fr.*: 6-9. *Forest margins, roadsides, often somewhat dry places in disturbed areas; between 200-1000 m altitudes.*

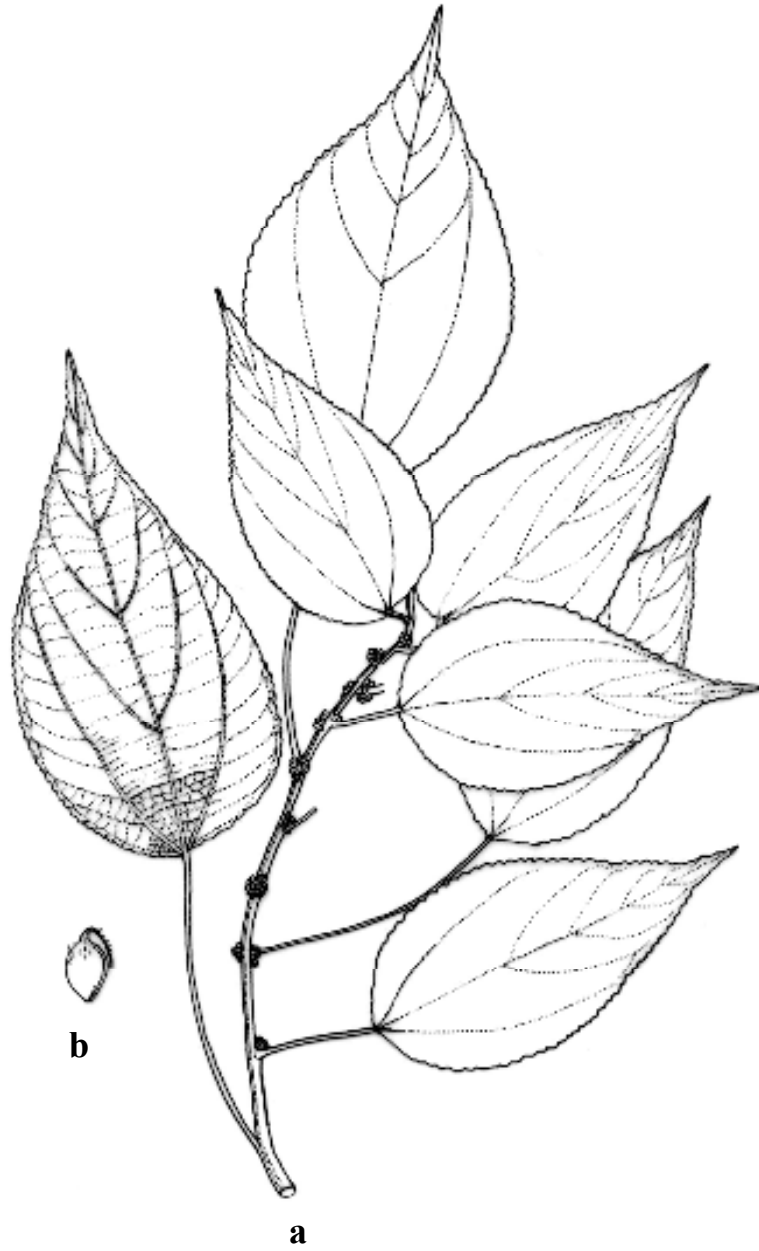


Figure 3. *Bohmeria glomerulifera* Miq.: a) Flowering shoot; b) Achene.

East Bengal: Collection place and date unknown, Griffith, 4562 (CAL 433793).

Rangamati: Rampahar, Kaptai, 19 x 2003, *S.N. Uddin*, N-2127 (DACB 418060).

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

Boehmeria glomerulifera Miq. in Zollinger, Syst. Verz. Ind, Archip.: 101. 1854. Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 411. 2009; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 201. 1982. *Urtica malabarica* Wall., Numer. List: 4610. 1831. *Boehmeria depauperata* Wedd., Ann. Sci. Nat., Bot. IV, 1: 202. 1854. *Boehmeria malabarica* Wedd., Arch. Mus. Hist. Nat. 8: 355. 1856. Kurz, Forest Fl. Brit. Burma 2: 422. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 575. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 723. 1903 (Indian reprint ed. 1963); Brandis, Indian Trees 617. 1906; Cowan & Cowan, Tree North Beng.: 128. 1929; Heinig, List Chittagong: 66. 1925; Kanjilal *et al.*, Fl. Assam 4: 286. 1940 (reprint 1982); Alam, Pl. Taxon. Series, Bull. 5: 114. 1988. *Boehmeria leiophylla* W.T. Wang, Acta Bot. Yunnan. 3: 318. 1981. *Boehmeria oblongifolia* W.T. Wang, Acta Bot. Yunnan. 3: 319. 1981. *Boehmeria glomerulifera* Miq. var. *leioclada* W.T. Wang in Fl. Reipubl. Popul. Sin. 23(2): 326. 1995. *Boehmeria malabarica* var. *leioclada* (W.T. Wang) W.T. Wang, in Fl. Reipubl. Popul. Sin. 23(2): 326. 1995. **Fig. 3.**

Local name: *Borothurthuri*

Dioecious or monoecious, shrubs or small trees, up to 5 m tall, branches terete, pubescent or glabrous. Leaves alternate; stipules lanceolate, 4-8 mm long, caducous; petioles 2-12 cm long, pubescent or glabrous; blade ovate, elliptic, ovate-oblong or subelliptic, 5-20 × 3-10 cm, base broadly cuneate, rounded or obtuse, apex acuminate or caudate-acuminate, margin crenate-serrate, except a little part towards the base, papery or membranous, glabrous and sometimes tessellately rugose above, softly pubescence below, lateral veins 3 or 4 pairs along midvein. Glomerules in the axils of leaf or fallen leaves along normal leafy stems, 4-10 mm in diameter, male ones on proximal part of flower-bearing branches; female ones on distal part. Flowers usually unisexual, sometimes bisexual, minute, greenish-white. Male flowers: 4-merous, sessile or very shortly pedicellate, ca. 1 mm long, pubescent; perianth 4-lobed, lobes valvate, corniculate; stamens as many as lobes, rudimentary ovule ellipsoid, ca. 0.7 mm diameter. Female

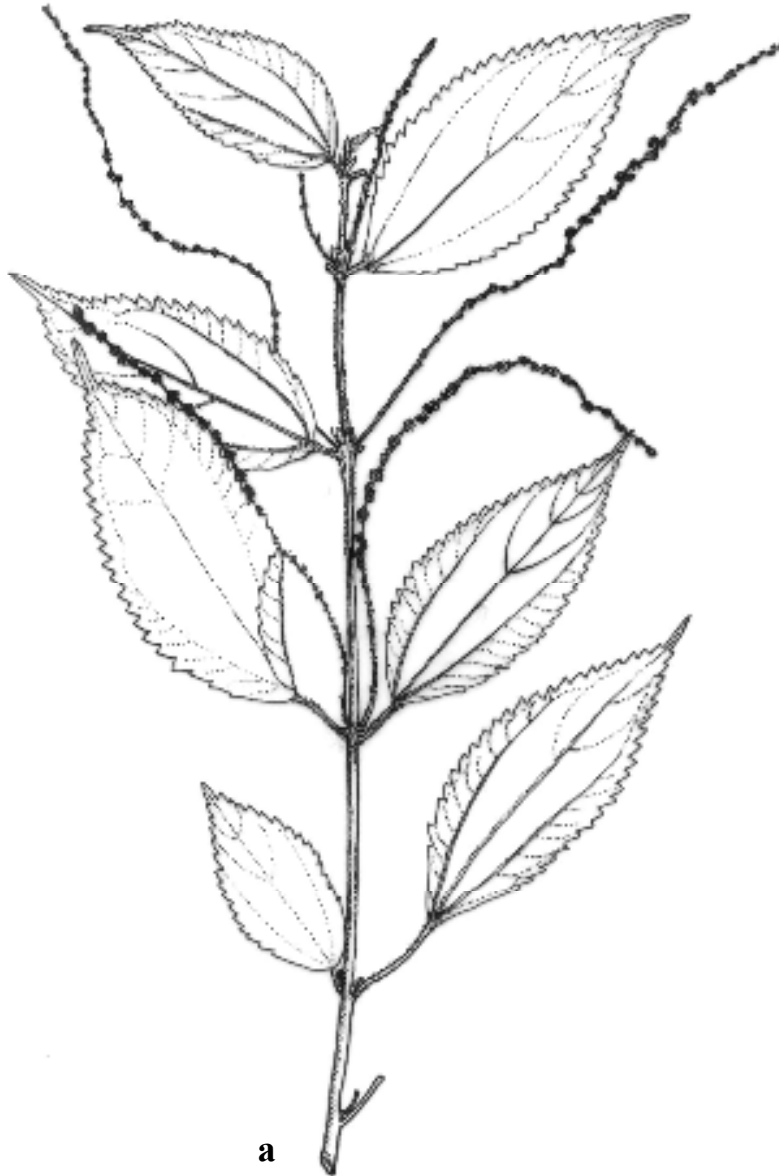


Figure 4. *Boehmeria hamiltoniana* Wedd.: a) Flowering shoot.

flowers: broadly obovoid or obovoid, ca. 1 mm diameter, pubescent, with short neck, 2-4 toothed; staminode absent, ovary included in the perianth, stigmas filiform, ca. 1.2 mm long, persistent. Fruit an ovoid, sessile achene, ca. 1.2 mm diameter; closely invested by the elliptic-obovoid, acute, brown, puberulous perianth. *Fl. & fr.*: 12-3. *Moist shady places throughout the evergreen and mixed evergreen forests; between 100-1000 m altitudes.*

Bandarban: P.C. Rainkhyong Valley, Ruma, 24 i 1965, *M.S. Khan*, 1005 (DUSH); Dumsha, Alikadam, 24 iii 1989, *M.K. Alam et al.*, 6352 (BFRI); Thanchi, 01 iii 2013, *S.N. Uddin*, N-5125 (DACB 41840). **Chattogram:** R.S. Forest Range, Hazarikhil, 14 iii 1964, *M.S. Khan*, K-821 (DUSH); Hazarikhil, 11 iii 1964, *M.S. Khan*, K-795 (DUSH); Hazarikhil, 11 iii 1964, *M.S. Khan*, K-793 (DUSH); Baraiyadhala, Hazarikhil, 14 iii 1964, *M.S. Khan*, K-821 (DUSH); Chandranath Hill, 23 i 1968, *M.S. Khan*, K-1572 (DUSH); Shahashradhara near Baraiyadhala, 26 i 1968, *M.S. Khan*, K-1606 (DUSH); Hinguli, 6 ix 1983, *M.K. Alam*, 6481 (BFRI); Koila beat, Korerhat, 31 i 1990, *D.K. Das and M.K. Alam*, 6515 (BFRI). **Chittagong Hill Tracts:** 24 ii 1879, *J.S. Gamble* 6946 (CAL); 15 ii 1940, *S.K. Mukerjee* 199 (CAL). **Rangamati:** Sitapahar, Kaptai, 26 ii 1965, *M.S. Khan*, K-1185 (DUSH); Pablakhali, Saratali, 3 iv 1977, *Huq and Rahman*, H-3280 (DACB 6107); Sitapahar, Kaptai, Pathartala, 25 ix 2002, *S.N. Uddin*, N-1574 (DACB 40447); Rampahar, Kaptai, 19 x 2003 *S.N. Uddin*, N-2127 (DACB 33440); Pharu Reserve forest, Monlovichara, 18 iv 2009, *B. Khan et al.*, B-1461 (DACB 34920). **Sylhet:** Patharia, Madhabkundo, 28 iii 1981, *M.S. Khan et al.*, K-6229 (DACB 6106).

Bhutan, India, Sri Lanka, Myanmar, Thailand, Vietnam, Laos, Indonesia, Malay Peninsula and China.

Rope is made with the bast fibre of the plant.

Boehmeria hamiltoniana Wedd., *Ann. Sci. Nat., Bot., sér. 4, 1*: 199. 1854. *Kurz*, *Forest Fl. Brit. Burma* 2: 424. 1877 (Repr. 1974); *Hook.f.*, *Fl. Brit. India* 5: 579. 1888 (Indian repr. 1954); *Brandis*, *Indian Trees* 617. 1906; *Hara et al.*, *Enu. Fl. Pl. Nepal* 3: 201. 1982; *Kanjilal et al.*, *Fl. Assam* 4: 289. 1940 (reprint 1982); *Uddin et al.*, *Bull. Bangladesh National Herb.* 4: 5. 2015. *Boehmeria platyphylla* D.Don var. *hamiltoniana* (Wedd.) Wedd., *Prodr.* 16 (1): 213. 1869. **Fig. 4.**

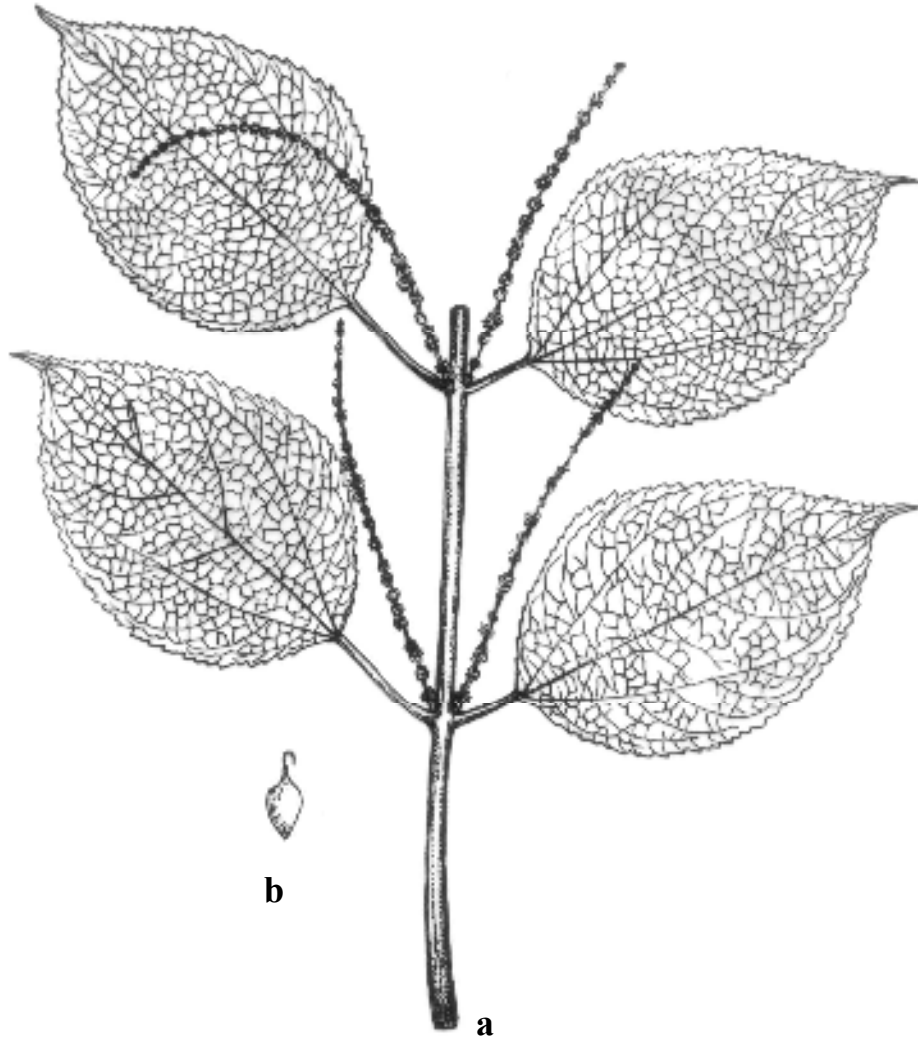


Figure 5. *Boehmeria macrophylla* Hornem.: a) Flowering shoot; b) Achene.

Shrubs up to 2 m tall; branches glabrous, without stinging hairs. Leaves opposite, unequal in size; leaf blades obliquely ovate, oblong, or rarely lanceolate, 8-21 × 3.5-8.0 cm, base broadly cuneate or obliquely subrounded, apex acuminate, margin inconspicuously crenulate, herbaceous, 3-nerved, secondary veins 2 pairs along midrib, lower surface pubescent along veins, upper surface sparsely strigose, cystoliths punctiform; stipules intrapetiolar, subulate-lanceolate, ca. 7 mm, deciduous; petiole 1.2-7.0 cm long, strigose, glabrous. Glomerules unisexual, on long spike like inflorescences, usually with a few long basal branches, widely separated; male spikes up to ca. 18 cm long; bisexual or female spikes very slender, up to 20 cm long. Flowers unisexual; bracts and bracteoles small, scarious. Male flowers: 4-merous, sessile; perianth lobes elliptic, ca. 1.5 mm, sparsely puberulent, connate at base, valvate; stamens 4, filaments inflexed in bud; rudimentary ovary subglobose, rudimentary ovule ellipsoid, ca. 0.5 mm. Female flowers: perianth tubular, usually compressed, apex 2-toothed, in fruit sometimes enlarged and dilated into 2 acute angles, staminodes absent. Ovary included, stigma filiform, pilose on one side, ovule orthotropous. Fruiting perianth ellipsoid, compressed, ca. 1 mm long, strigose on shoulder, base sharply cuneate, stipitate, apex 2-toothed. Achenes not lustrous, enclosed by marcescent perianth. Seeds with endosperm, cotyledons elliptic. *Fl. & fr.*: 5-12. *Margins of secondary forests, moist places along streams; up to 700 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4560 (CAL 434112).

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

Boehmeria macrophylla Hornem., Hort. Bot. Hafn. 2: 890. 1815. Brandis, Indian Trees 617. 1906; Cowan & Cowan, Tree North Beng.: 128. 1929; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 412. 2009. *Boehmeria caudata* Poir., Descr. Pl. Malmaison t. 15. 1812. *Boehmeria ternifolia* D.Don, Prodr. Fl. Nepal. 59. 1825. *Boehmeria platyphylla* D.Don, Prodr. Fl. Nepal.: 60. 1825; Brandis, Indian Trees 617. 1906. *Boehmeria scabrella* (Roxb.) Gaudich., Voy. Uranie 499. 1830; Alam, Pl. Taxon. Series, Bull. 5: 114. 1988. *Urtica scabrella* Roxb., Fl. Ind., ed. 1832, 3: 581 (1832). *Boehmeria interrupta* Guill., Ann. Sci. Nat., Bot. II, 7: 182. 1837. *Boehmeria elongata* Steud., Nomencl. Bot. ed. 2, 1: 212. 1840. *Boehmeria humilis* Miq., Pl. Jungh.: 33. 1851. *Boehmeria ourantha* Miq., Pl. Jungh. 33. 1851. *Boehmeria rugosissima* Miq.,

Pl. Jungh. 32. 1851. *Boehmeria sumatrana* Miq., Pl. Jungh. 32. 1851. *Splitgerbera macrostachya* Wight, Icon. Pl. Ind. Orient. 6: t. 1977. 1853. *Boehmeria canescens* Wedd., Ann. Sci. Nat., Bot. IV, 1: 200. 1854. *Boehmeria caudigera* Wedd., Ann. Sci. Nat., Bot. IV, 1: 199. 1854. *Boehmeria elliptica* Wedd., Ann. Sci. Nat., Bot. IV, 1: 200. 1854. *Boehmeria taitensis* Wedd., Ann. Sci. Nat., Bot. IV, 1: 200. 1854. *Boehmeria erythropoda* Miq., Syst. Verz. 101. 1854. *Boehmeria macrostachya* (Wight) Wedd., Ann. Sci. Nat., Bot. IV, 1: 199. 1854. *Boehmeria microcarpa* Wedd., Ann. Sci. Nat., Bot. IV, 1: 201. 1854. *Boehmeria mauritiana* Wedd., Ann. Sci. Nat., Bot. IV, 1: 200. 1854. *Boehmeria platyphylla* D. Don var. *scabrella* (Roxb.) Wedd. in Candolle, Prodr. 16(1): 211 (1856); Hook.f., Fl. Brit. India 5: 578. 1888 (Indian repr. 1954). *Boehmeria massuriensis* Blume, Mus. Bot. 2: 216. 1857. *Boehmeria wightiana* Blume, Mus. Bot. 2: 217. 1857. *Boehmeria platyphylla* var. *macrostachya* (Wight) Wedd., Arch. Mus. Hist. Nat. 9: 367. 1856. *Boehmeria urantha* Blume, Mus. Bot. 2: 221. 1857. *Boehmeria platyphylla* var. *masoalensis* Leandri, in Fl. Madag. 56: 76. 1965. *Boehmeria platyphylla* var. *canescens* (Wedd.) Wedd., Prodr. 16(1): 213. 1869. *Boehmeria scabrella* (Roxb.) Gaudich. Prain, Beng. Pl. 2: 723. 1903 (Indian reprint ed. 1963). *Boehmeria platyphylla* var. *austroqueenslandica* Domin, Biblioth. Bot. 89: 22. 1921. *Boehmeria macrophylla* var. *canescens* (Wedd.) D.G. Long, Notes Roy. Bot. Gard. Edinburgh 40: 129. 1982. *Boehmeria macrophylla* var. *longissima* (Hook.f.) V.S. Ramach. & V.J. Nair, Fl. Cannanore 436. 1988. *Boehmeria macrophylla* var. *dongtousensis* W.T. Wang, Bull. Bot. Res., Harbin 16: 248. 1996. *Boehmeria macrophylla* var. *zeylanica* (Wedd.) Wadhwa, Revised Handb. Fl. Ceylon 13: 265. 1999.

Fig. 5.

Local name: *Ulichara*

English names: African Jolanettle, False Nettle

Perennial, dioecious or monoecious shrubs or herbs, up to 3 m tall. Branches 4-angled, strigose hairy to glabrescent. Leaves simple, mostly opposite, sometimes alternate, unequal in size; stipules lanceolate, 8-10 mm long, membranous, puberulous on the nerves; petioles 2-12 cm long, pubescent; leaf blades orbicular-elliptic, ovate or obovate, or sublanceolate, 5-10 × 2-6 cm, base rounded or subcordate, sometimes oblique, apex gradually acuminate, margins serrulate or denticulate, teeth 2-5 mm, membranous, herbaceous, or rarely papery, abaxial surface rugulose, with reticulate veins strongly raised, sparsely strigose or patent pubescent along veins, adaxial surface rugose, stiffy

hispid, lateral veins 2-3 pairs along midvein, stipules triangular-lanceolate, 8-10 mm long. Glomerules unisexual, on long spike-like branches, branches erect or pendent, usually unbranched, but sometimes with short or long lateral branches from the base, glomerules separated or sometimes densely congested, female ones in distal axils, 5-20 cm long. Male flowers 4-merous, sessile, perianth lobes c 1.5 mm long, sparsely pubescent, connate at base, rudimentary ovule ellipsoid, c 0.4 mm long. Fruiting perianth tube ellipsoid, ca. 1 mm long, compressed, smooth, strigose on shoulder, apex 2-toothed. Achenes c 2 mm long, glossy, compressed, enclosed in the persistent, glabrescent to pubescent perianth. $2n = 28, 56$ (Kumar & Subramaniam, 1986). *Fl. & fr.*: 7-12. Chromosome number: $2n = 28, 56$ (Kumar and Subramaniam, 1986). *Disturbed places in secondary forests, thickets, roadsides, along streams; between 100-800 m altitudes.*

Chattogram: Chunati, 8 x 1989, *M.S. Khan et al.*, 8120 (BFRI). **Chittagong Hill Tracts:** 15 ii 1940, *S.K. Mukerjee* 80 (CAL). **East Bengal:** Locality & date unknown, Griffith, 4550 (CAL). **Moulvibazar:** Kamalgonj, Lawachara National Park, 10 x 2009, *S.N. Uddin*, N-4068 (DACB 41958). **Rangamati:** Thandachari, Sitapahar, Kaptai, 26 x 1995, *M. Mohiuddin and Mezan*, 7580 (BFRI).

Tropical Africa, Sri Lanka, Bhutan, India, Nepal, Myanmar, Thailand, Vietnam, Laos, China and Indonesia.

Rope is made with the bast fibre of the plant.

Boehmeria manipurensis Friis & Wilmot-Dear, *Edinb. J. Bot.* 67 (3): 438-440, f. 3. 2010. Uddin *et al.*, *Bull. Bangladesh National Herb.* 4: 6. 2015. **Fig. 6.**

Undershrubs or shrubs, up to 3 m tall; branchlets and petioles pubescent or strigose; bark brownish-grey, rough, thin. Leaves alternate, linear-lanceolate, $2-12 \times 1.2-5.0$ cm, base obtuse or rounded, apex acuminate, margins dentate or coarsely serrate, cystoliths punctiform, membranous, dark-green, smooth or scaberulous and somewhat rough above, beneath strigose or pubescent with a grey or white tomentum, strigose on the nerve, 3-nerved; petiole 1.2-5.0 cm long. Flowers in axillary clusters, pubescent or hoary, unisexual; bracts and bracteoles small, scarious. Male flowers: perianth 4 lobed or parted, segments valvate; stamens 4, filaments inflexed in bud; rudimentary ovary clavate or

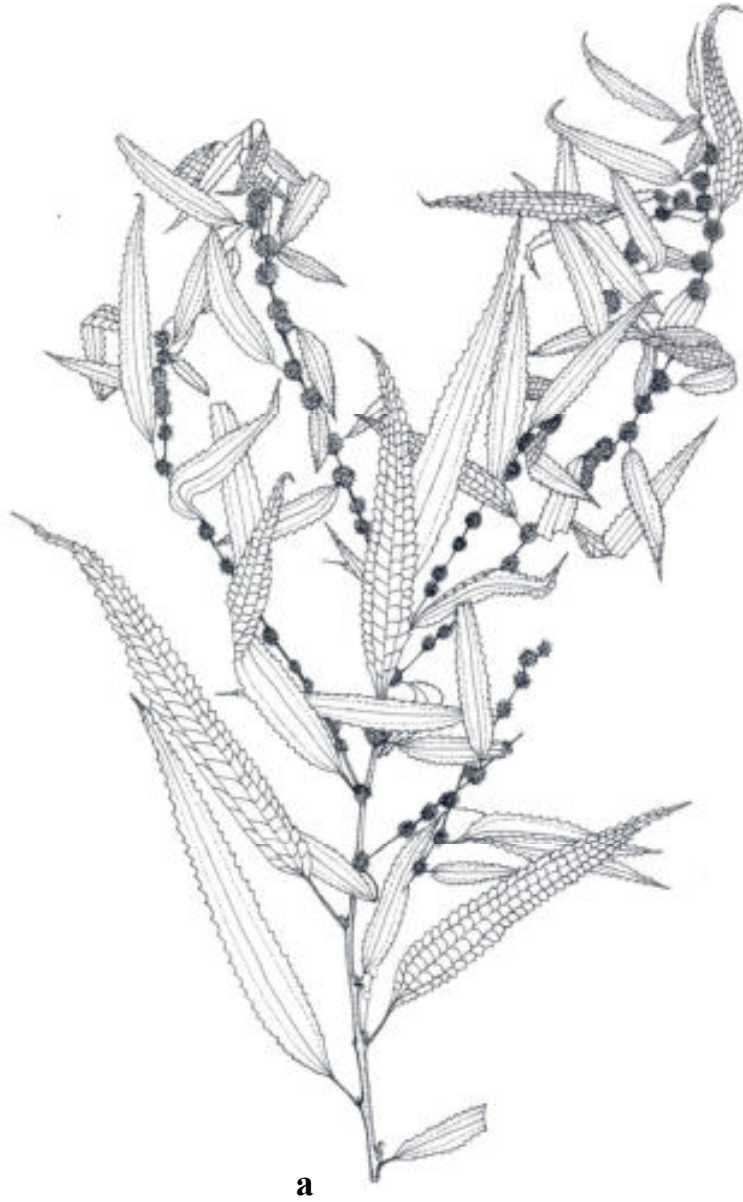


Figure 6. *Boehmeria manipurensis* Friis & Wilmot-Dear: a) Flowering shoot.

subglobose. Female flowers: perianth tubular, usually compressed, apex 4-toothed, in fruit sometimes enlarged and dilated into 2 acute angles or wings; staminodes absent; ovary included, stigma filiform, style pilose on one side, usually persistent for some time; ovule orthotropous. Achenes ovoid, enclosed by marcescent perianth, angled, sparsely hispid towards the apex. Seeds with endosperm; cotyledons elliptic or ovate. *Fl. & fr.*: 11-3. *Hill forests, on steep slopes; up to 1200 m altitude.*

Khagrachari: Gomoti, Panchari, 23 iv 2011, *S.N. Uddin* N-4578 (DACB).

Rangamati: Sapchari, 21 xi 1980, *M.S. Khan et al.*, K-6124 (DACB); Ghagra, 15 x 1978, *M.S. Khan and A.M. Huq*, K-5214 (DACB).

India, Myanmar, Malaysia.

Leaves are eaten as vegetables and coarse rope is made from bark of the plant.

Boehmeria nivea (L.) Gaudich., *Voy. Uranie Bot.*: 499. 1830. *Prain, Beng. Pl.* 2: 723. 1903 (Indian reprint ed. 1963); *Brandis, Indian Trees* 617. 1906; *Kanjilal et al.*, *Fl. Assam* 4: 287. 1940 (reprint 1982). *Ullah in Ahmed et al.*, *Encycl. Fl. Fauna Bangladesh* 10: 413. 2009. *Urtica nivea* L., *Sp. Pl.* 985. 1753. *Boehmeria tenacissima* Gaudich., *Voy. Uranie* 500. 1830. *Urtica tenacissima* Roxb., *Fl. Ind. ed.* 1832, 3: 590. 1832. *Boehmeria nipononivea* Koidz., *Acta Phytotax. Geobot.* 10: 223. 1941. *Boehmeria candicans* Hassk., *Pl. Jav. Rar.* 203. 1848. *Boehmeria utilis* André, *Rev. Hort.* 62: 184. 1890. *Ramium niveum* (L.) Kuntze, *Revis. Gen. Pl.* 2: 632. 1891. *Boehmeria thailandica* Yahara, *Acta Phytotax. Geobot.* 32(3-4): 4. 1981. **Fig. 7.**

Local name: *Kankhura*

English names: Ramie, Rhea, China Grass

Monoecious, perennial subshrubs or shrubs, up to 2 m tall, with long rhizome and tuberous storage roots. Stem simple or few, 8-16 mm in diameter, densely patent hirsute, appressed strigose, initially green turning brownish and woody. Leaves simple, alternate; stipules lanceolate, 2-cleft, 6-10 mm long, free or connate; petioles 3-10 cm long, densely patent hirsute, appressed strigose or only strigose; leaf blades broadly orbicular or ovate, 5-20 × 4-12 cm, base cuneate to subcordate, or subtruncate, apex usually abruptly long acuminate or cuspidate, margin coarsely dentate to dentate-serrate or crenate, herbaceous, green and scabrid above, glabrous and snowy tomentose, sometimes light green with strigose hairs on veins, or thinly white tomentose below, secondary veins 3 each side of



Figure 7. *Boehmeria nivea* (L.) Gaudich.: a) Flowering shoot; b) Male flower.

midvein. Inflorescence racemose, paniculate, 3-8 cm long, each branch bearing several crowded or well-separated clusters of unisexual glomerules, on specialized branches in the axils of current or recently fallen leaves, male branches proximal or sometimes absent, female distal; male glomerules usually with 3-10-flowered, 2-4 mm in diameter; female glomerules usually with 10-30-flowered, 2-3 mm in diameter. Male flowers: 4-merous, sessile; perianth 3-5 lobed, ca. 1.5 mm long, pubescent, connate to middle; stamens as many as lobes and incurved with persistent rudiment of pistillode. Female flowers: rhomboid-ellipsoidal, 0.6-0.8 mm diameter, sessile; perianth tubular, 2-4 lobed, greenish to pinkish; ovary 1-celled; styles exserted, slender and hairy on one side; stigmas filiform, ca. 1 mm long; ovule solitary. Fruit a subglobose to ovoid achene, 0.6-1.0 mm in diameter, enclosed by the persistent, rhomboid-obovoid perianth, compressed, ca. 1 mm long, strigose on shoulder, base constricted and stalklike, apex almost without neck, 2-3-toothed, brown-yellow. Seeds subglobose to ovoid, slightly less than 1 mm in diameter, dark brown. $2n = 22, 28, 42$ (Kumar and Subramaniam, 1986). *Fl. & fr.*: 5-11. *Forest margins, thickets, moist places along streams, roadsides; between 200-700 m altitudes.*

Dhaka: Dhaka University Botanical Garden, 13 x 1943, *P. Maheshwari & S.K. Sen*, (DUSH); 24 ix 1946, *S.K. Sen*, (DUSH); 8 x 1954, *M. Moharazuddin*, 27 (DUSH).

Bhutan, India, Nepal, Thailand, Cambodia, Vietnam, Laos, China, Malaysia, Indonesia, the Philippines, Japan, Korea.

Roots are aperient and leaves are resolvent (Kirtikar and Basu, 2012). Stem fibre is used in textile for making ropes, sacks, strings, fishing lines and nets. Ramie is often blended with polyester, wool, silk or cotton. The plant is used for the production of high-quality paper. Leaves are also used as green manure and cattle feed. Leaves are used to poultice boils and against flatulence. Decoction of root and leaf is taken as a tonic in the case of dysentery and ulcers (Ullah, 2009).

Boehmeria penduliflora Wedd. *ex* D.G. Long, Notes Roy. Bot. Gard. Edinburgh. 40: 130. 1982. *Boehmeria macrophylla* D.Don, Prodr. Fl. Nepal. 60. 1825, not Hornem. (1815); Kurz, Forest Fl. Brit. Burma 2: 424. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 577. 1888 (Indian repr. 1954); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 201. 1982; Kanjilal *et al.*, Fl. Assam 4: 288. 1940 (reprint 1982). **Fig. 8.**

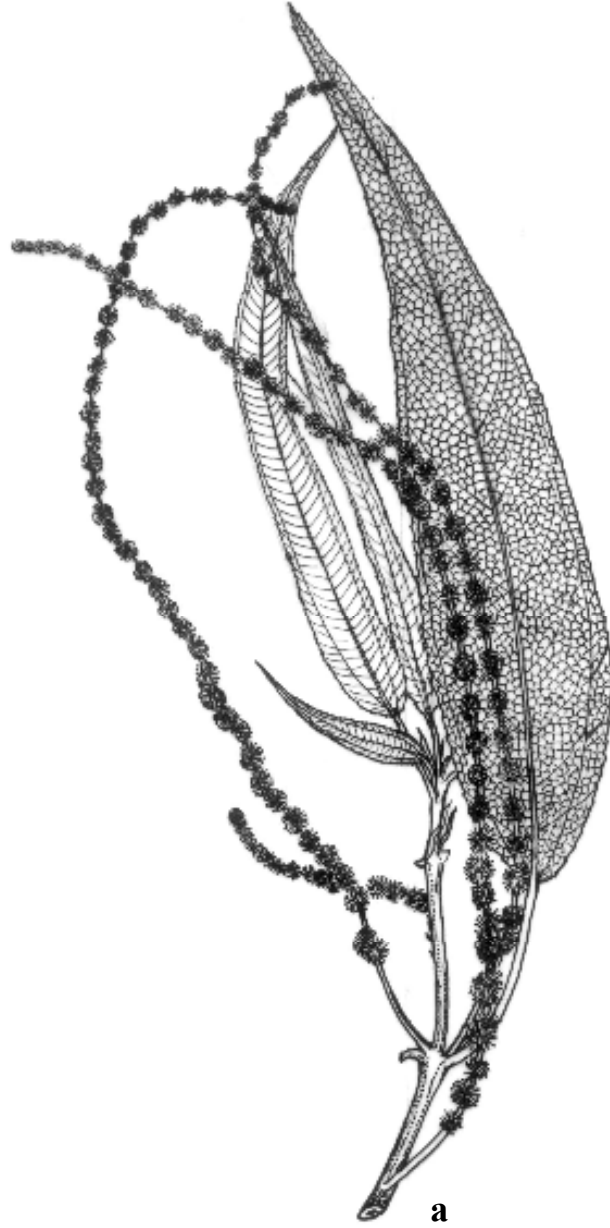


Figure 8. *Bohmeria penduliflora* Wedd. ex D.G. Long: a) Flowering shoot.

Dioecious or monoecious shrubs, erect, sometimes with trailing branches, 1.5-3.0 m tall; branchlets 4-angled, 4-grooved, often densely strigillose. Leaves opposite, slightly unequal in size; stipules narrowly triangular-lanceolate, 1.2-1.8 cm long; petiole 0.5-3.0 cm long, often strigillose; leaf blades lanceolate or linear-lanceolate, 5-30 × 1.5-6.0 cm, base rounded, obtuse, or subcordate, apex long caudate to cuminata, margin minutely serrulate, teeth revolute, thickly papery, secondary veins 3 or 4 pairs, lower surface sparsely or densely pubescent along veins, upper surface often strongly rugose, glabrous or sparsely strigillose, roughened. Inflorescence glomerules on spikelike flowering shoots; female glomerules congested, 4-8 mm in diameter; male spikes often in pairs, in proximal axils, shorter than female spikes; female spikes unbranched, in distal axils, nodding, 4-30 cm long. Male flowers 4-merous, sessile; perianth lobes elliptic, 1.0-1.4 mm long, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, 0.4-0.5 mm diameter. Fruiting perianth tube narrowly cuneate, oblanceolate or fusiform, compressed, 1-2 mm long, sparsely strigillose on shoulder, base with stipe 1.1-1.3 mm long, 2-toothed at apex of very short neck; achenes oblong-ovoid, 0.4-0.6 mm diameter, base long stipitate. *Fl. & fr.*: 4-10. *Evergreen hilly forests, along streams; between 500-1000 m altitudes.*

Rangamati: Pharua reserved forest, 15 x 2008, *B. Khan et al.*, B-1116 (DACB 33495); Pharua reserved forest, Pharua chara, 16 i 2009, *B. Khan and S.N. Uddin*, B-1216 (DACB).

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

Debregeasia Gaudich., *Bot. Voy. Bonit.*: t. 90. 1844-1866.

Type species: *Debregeasia velutina* Gaudich.

Monoecious or dioecious shrubs or small trees, without stinging hairs. Leaves alternate, petiolate; stipules deciduous, intrapetiolar, connate, membranous, 2-cleft; leaf blades thinly papery or papery, often snow white or silvery tomentose abaxially, margin serrulate, 3-nerved at the base, cystoliths punctiform. Inflorescences axillary, sessile or dichotomously branched cymes or spikes, unisexual or rarely bisexual; glomerules solitary or pairs of dichotomously branched cymes. Flowers densely clustered, bracteate. Male flowers: (3-) 4 (-5) merous; perianth lobes slightly connate, valvate, often depressed-globose in bud; stamens (3 or)4(or 5); filaments inflexed in bud; rudimentary ovary obovoid, woolly at base. Female flowers: densely crowded on fleshy, swollen

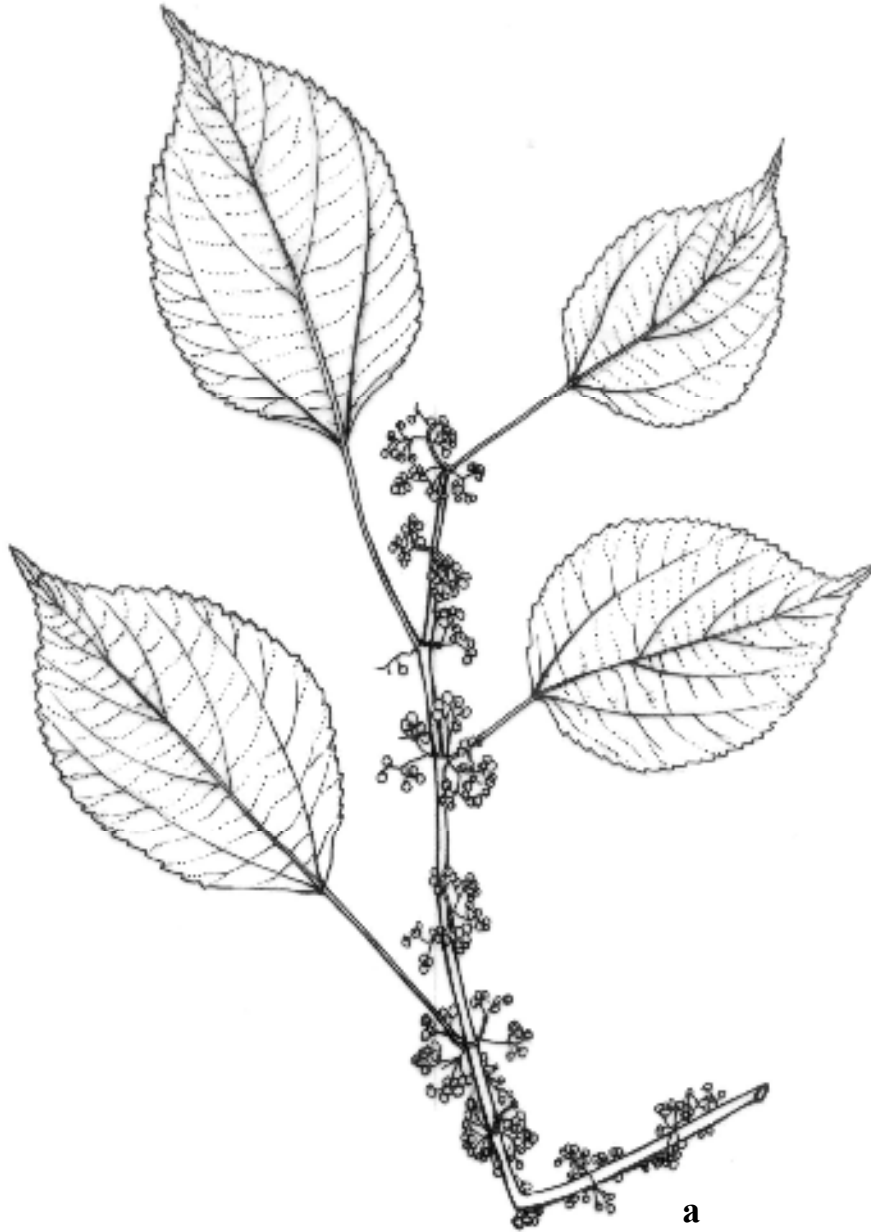


Figure 9. *Debregeasia dentata* King ex Hook.f.: a) Flowering shoot.

receptacle, perianth tube obovoid or jug-shaped, mouth contracted, very minutely 3- or 4-toothed, in fruit often enlarged, fleshy, adnate to ovary, rarely membranous, free; staminodes absent; style short; stigma penicillate, with tuft of long hairs; ovules orthotropous. Achenes drupaceous, obovoid, slightly compressed, closely enclosed by often fleshy, adnate perianth. Seeds with copious endosperm; cotyledons small, broad.

KEY TO THE SPECIES

- | | |
|---|-----------------------|
| 1. Leaves broadly ovate, elliptic, or cordate; fruit enclosed by membranous perianth | 2 |
| + Leaves lanceolate, sometimes narrowly ovate or oblong; fruit enclosed by succulent perianth | D. longifolia |
| 2. Branches without protuberances or warts; inflorescences more than 5 cm long; leaf margin sinuate-dentate, secondary veins in 5-8 pairs | D. wallichiana |
| + Branches with fleshy, scale-like protuberances or warts; inflorescences to 3 cm long; leaf margin denticulate, secondary veins in 3-5 pairs | D. dentata |

Debregeasia dentata Hook.f., Fl. Brit. India. 5: 591. 1888. Prain, Beng. Pl. 2: 725. 1903 (Indian reprint ed. 1963); Brandis, Indian Trees 618. 1906; Kanjilal *et al.*, Fl. Assam 4: 296. 1940 (reprint 1982); Heinig, List Chittagong: 67. 1925; J.Sinclair, Fl. Cox's Bazar: 107. 1956. *Debregeasia squamata* f. *etuberculata* Wilmot-Dear, Kew Bull. 43: 687. 1988. **Fig. 9.**

Shrubs, 1-2 m tall, monoecious. Branches stout, leaf scars conspicuous; branchlets greenish, aging brown, branchlets and branches with fleshy, spreading scale-like protuberances or warts and mixed appressed hairs; protuberances fleshy, recurved, 2-5 mm, hairs of branchlets and stipules reddish brown, appressed. Stipules lanceolate, 7-8 mm, 2-cleft in distal one third; petiole 2-7(-14) cm; leaf blade abaxially greenish gray, adaxially dark green, ovate or cordate, 6-16(-22) × 4-12(-18) cm, thinly papery, 3-veined, lateral ones arcuate, reaching to distal one fourth, anastomosing with lowest of secondary veins 3-5 on each side distally, abaxial surface thinly tomentose, adaxial surface sparsely appressed strigose, sometimes rugose, sparsely appressed pubescent on veins, base

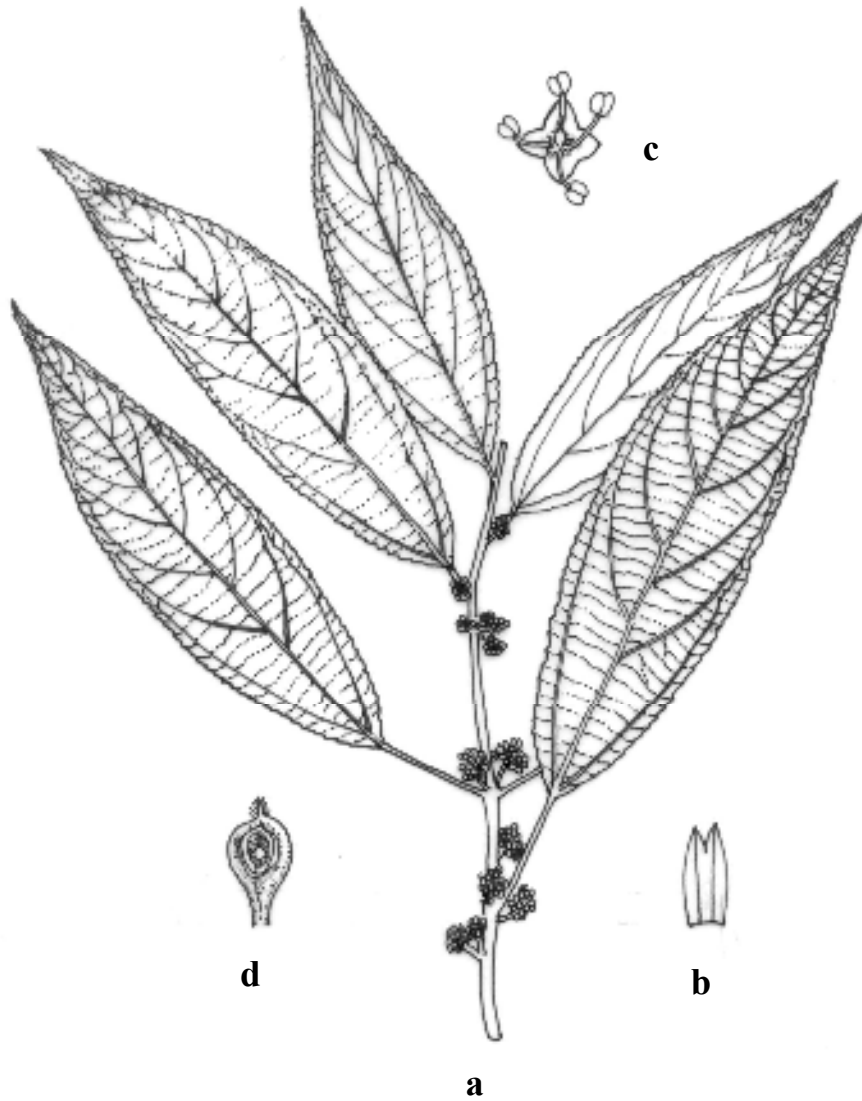


Figure 10. *Debregeasia longifolia* (Burm. f.) Wedd.: a) Flowering shoot; b) Stipule; c) Male flower; d) LS of Achene.

rounded or cordate, margin denticulate, apex shortly acuminate. Inflorescences borne on current and previous year's branches, 2-3-dichotomously branched, 1-3 cm long; peduncle ca. 0.5 cm long, spreading hirtellous; glomerules globose, 3-4 mm in diameter; bracts triangular-lanceolate, 0.6-1.0 mm long, membranous, densely pubescent abaxially. Male flowers shortly pedicellate, globose in bud, ca. 1.2 mm in diameter; perianth lobes 3(or 4), broadly ovate, puberulent abaxially, connate at middle, acute; rudimentary ovary stipitate, obovoid, ca. 0.6 mm long. Female flowers sessile, obovoid, ca. 0.6 mm long; perianth tube membranous, 4-ribbed, 4-denticulate at apex. Achene ca. 1 mm long, enclosed by membranous perianth. *Fl. & fr.*: 8-12. *Thickets, valleys, shady, wet places; up to 800 m altitudes.*

Chattogram: Chattogram, 12 vii 1857, J.D. Hooker and T. Thomson, 606 (K000741648); Pruskul, 13 ii 1873, C.B. Clarke, 19714A (K000741646); Hazarikhil, 1 xi 1983, *M. Yusuf*, 412 (DACB 23968). **Rangamati:** Monlovichara, Pharu reserved forest, 17 i 2009, *B. Khan & S.N. Uddin*, B-1251 (DACB 34222).

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

Debregeasia longifolia (Burm.f.) Wedd. in Candolle, Prodr. 16(1): 235. 1869. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 202. 1982; Kanjilal *et al.*, Fl. Assam 4: 295. 1940 (reprint 1982). *Urtica longifolia* Burm.f., Fl. Indica, 197. 1768. *Urtica angustata* Blume, Bijdr. Fl. Ned. Ind. 499. 1825. *Debregeasia velutina* Gaudich., Voy. Bonite, Bot. 3: t. 90. 1844; Hook.f., Fl. Brit. India 5: 590. 1888 (Indian repr. 1954); Brandis, Indian Trees 618. 1906. *Boehmeria angustata* Hassk., Cat. Hort. Bot. Bogor. 79. 1844. *Boehmeria dichotoma* Hassk., Cat. Hort. Bot. Bogor. 79. 1844. *Morocarpus dichotomus* (Blume) Blume, Mus. Bot. 2: 157. 1856. *Morocarpus velutinus* Blume, Mus. Bot. 2: 156. 1856. *Morocarpus longifolius* (Burm.f.) Blume, Mus. Bot. 2: 156. 1856; Kurz, Forest Fl. Brit. Burma 2: 428. 1877 (Repr. 1974). *Conocephalus niveus* Wight, Icon. Pl. Ind. Orient. 6: t. 1959. 1853. *Debregeasia dichotoma* (Blume) Wedd., Arch. Mus. Hist. Nat. 9: 462. 1857. *Debregeasia angustifolia* C.B. Rob., Philipp. J. Sci., C, 6: 18. 1911. *Debregeasia luteocarpa* Elmer, Leafl. Philipp. Bot. 8: 2843. 1915. *Debregeasia libera* Chien & C.J. Chen, Acta Phytotax. Sin. 21: 476. 1983. **Fig. 10.**



Figure 11. *Debregeasia wallichiana* (Wedd.) Wedd.: a) Flowering shoot.

Dioecious or monoecious shrubs or small trees, 3-5 m tall. Branchlets slender, reddish or purplish brown; branchlets and petioles densely spreading hirtellous; stipules oblong-lanceolate, 6-10 mm long, 2-cleft; petiole 1-4 cm long; leaf blades oblong or obovate-lanceolate, sometimes linear or narrowly ovate, 5-20(-25) × 2-5(-6.5) cm, base rounded or subcordate, rarely broadly cuneate, apex acuminate, margin finely serrulate or denticulate throughout, papery, upper surface dark green, 3-veined, lateral ones straight, reaching to middle, secondary veins 5-8 (-10) on each side, anastomosing at margin, lower surface thinly greenish gray or gray-white tomentose, densely hirtellous on veins, upper surface sparsely appressed strigose, sometimes rugose. Inflorescences borne on both old and new branches, 2-4-dichotomously branched, 1.0-2.5 cm long; peduncles 0.5-3.0 cm long, spreading hirtellous; glomerules globose, 3.4 mm in diameter; bracts triangular-ovate, ca. 1 mm, membranous. Male flowers shortly pedicellate, obovoid in bud, 1.2-1.5 mm in diameter; perianth lobes 4, broadly ovate, puberulent abaxially, connate at middle, apex acute; rudimentary ovary sessile, obovoid, 0.4-0.6 mm diameter. Female flowers sessile, obovoid, 0.7-0.9 mm diameter; perianth tube membranous, 4-denticulate at apex. Achenes reddish or orange, 1.0-1.5 mm diameter, enclosed by fleshy perianth. $2n = 28$ (Fedorov, 1969). *Fl. & fr.*: 8-2. *Hilly forests, shady, moist places along streams; between 500-700 m altitudes.*

Cox's Bazar: Teknaf, 22 xi 1978, *M.K. Alam and J.S. Womers*, 3135 (BFRI).

Sri Lanka, India, Bhutan, Nepal, Myanmar, Thailand, Vietnam, Cambodia, Laos, Indonesia, Malaysia, Philippines.

Debregeasia wallichiana (Wedd.) Wedd., Arch. Mus. Hist. Nat. 9: 464. 1857. Hook.f., Fl. Brit. India 5: 591. 1888 (Indian repr. 1954); Brandis, Indian Trees 618. 1906; Cowan & Cowan, Tree North Beng.: 129. 1929; Kanjilal *et al.*, Fl. Assam 4: 296. 1940 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 202. 1982; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 414. 2009. *Urtica leucophylla* Wall., Numer. List: 4067. 1831. *Missiessya wallichiana* Wedd., Ann. Sci. Nat., Bot., sér. 4: 195. 1854. *Morocarpus wallichianus* (Wedd.) Blume, Mus. Bot. 2: 157. 1856; Kurz, Forest Fl. Brit. Burma 2: 428. 1877 (Repr. 1974). *Debregeasia leucophylla* Wedd., Prodr. 16(1): 235. 1869. *Debregeasia ceylanica* Hook.f., Fl. Brit. India 5: 592. 1888. *Morocarpus ceylanicus* (Hook.f.) Kuntze, Revis. Gen. Pl. 2: 629. 1891. **Fig. 11.**

Monoecious shrubs or small trees, up to 6 m tall. Branchlets stout, leaf scars conspicuous, 3-4 mm diameter, smooth; branchlets appressed pubescent, bark brown. Leaves crowded at the apex of branchlets; stipules large, oblong-lanceolate, 10-20 × 2-5 mm, 2-cleft at apex; petioles 5-15 cm long, pubescent; leaf blades broadly ovate to orbicular, 5-20 × 4-15 cm, base broadly cuneate, rounded or cordate, apex shortly caudate or shortly acuminate, margin sinuate-dentate, thinly chartaceous to coriaceous, 3-veined, lateral veins 5-8 pairs, lower surface thinly white tomentose, sparsely appressed pubescent on veins, upper surface dark green, subglabrous or sparsely appressed strigose, sometimes rugose. Inflorescences borne on new and old branches, 3-7-dichotomously branched cymes, 3-7 cm diameter, orange-coloured; peduncles 2-7 cm long, hirsute; glomerules globose, 3-5 mm in diameter; bracts membranous, narrowly obovate to oblong-lanceolate or subcordate, 0.5-1.2 mm long, densely pubescent abaxially. Male flowers: 5-merous, shortly pedicellate, obovoid in bud, 1 mm in diameter; perianth lobes 5, broadly ovate, glabrous abaxially, connate at the middle, apex acute, reddish; anthers white; rudimentary ovary stipitate, obovoid, ca. 0.6 mm diameter. Female flowers: sessile, obovoid, 0.7-0.8 mm diameter; perianth tube membranous, 4-ribbed, 4-denticulate at apex; ovary obovoid, 1-locular, stigmas penicellate, locule with one basal ovule. Fruit an aggregate of achenes, in succulent clusters, slightly laterally compressed, 1.5-2.0 mm long when mature, pinkish, enclosed by membranous perianth but not adnate to it. *Fl. & fr.*: 6-10. *Tropical forests, hill slopes; between 300-900 m altitudes.*

Cox's Bazar: Himchari National Park, 15 x 1998, *A. Rahman et al.*, 452 (DACB). **Rangamati:** Bilaichari, Pharu Reserved Forest, Monlovichara, 14 x 2008, *S.N. Uddin*, N-2968 (DACB); 14 x 2008, *B. Khan et al.*, B-1091 (DACB). **Bandarban:** Ruma, Near Pransa, 25 i 1965, *M.S. Khan*, K-1135 (DUSH).

Bhutan, India, Sri Lanka, Nepal, Myanmar, Thailand, Cambodia and China.

Rope is made with the bast fibre of the plant.

Dendrocnide Miq., Pl. Jungh.: 29. 1851.

Type species: *Dendrocnide costata* Miq.

Dioecious, evergreen shrubs or trees, up to 15 m tall. Branches sympodial, often with terminal rosettes of leaves, with stinging hairs. Leaves simple, alternate or spiral; stipules deciduous, intrapetiolar, entire, connate, leathery, often large, apex entire; petiolate; leaf

blade coriaceous or papery, pinnately veined, rarely 3-5-veined, margin entire, undulate, or crenulate; cystoliths punctiform. Inflorescences axillary, racemose or paniculate, bracteate, pedunculate; female glomerules often with thickened, fleshy flabellate receptacle; bracts present. Flowers free, sessile to pedicellate, pedicels swollen, in small fascicles or on flabellate receptacles. Male flowers: tepals 4 (rarely 5), stamens 4 (rarely 5), filaments of stamens inflexed in bud; rudimentary ovary conspicuous. Female flowers: sessile or pedicellate; perianth lobes 4, connate at base, subequal, lateral lobes slightly larger; staminodes absent; ovary superior, ovoid, unilocular, stigmas usually filiform or ligulate; staminodes absent, ovules erect. Fruit an achene, compressed or ellipsoid to ovoid, slightly oblique, verrucose, persistent stigma usually reflexed; pedicels simple or swollen, cylindrical. Seeds with thin or no endosperm; cotyledons broad.

Dendrocnide sinuata (Blume) Chew, Gard. Bull. Singapore 21: 206. 1965. Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 416. 2009; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 202. 1982. *Urtica sinuata* Blume, Bijdr. Fl. Ned. Ind. 505. 1825. *Laportea crenulata* Gaudich., Voy. Bonite, Bot. 498. 1826; Kurz, Forest Fl. Brit. Burma 2: 421. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 550. 1888 (Indian repr. 1954); Heinig, List Chittagong: 66. 1925; Kanjilal *et al.*, Fl. Assam 4: 281. 1940 (reprint 1982); Alam, Pl. Taxon. Series, Bull. 5: 114. 1988. *Urtica crenulata* Roxb., Fl. Ind. ed. 1832 3: 591. 1832. *Urtica pulus* Steud., Nomencl. Bot. (ed. 2) 2: 735. 1841. *Laportea sinuata* (Blume) Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 301. 1869. *Laportea integrifolia* C.Y. Wu, Acta Phytotax. Sin. 6(3): 277-278. 1957. *Dendrocnide pulus* (Steud.) Chew, Gard. Bull. Singapore 21: 205. 1965. **Fig. 12.**

Local names: *Bangaldandi*, *Chotta-chorpata*, *Gopata-sarat*, *Laua-chutra*, *Sutra*
English name: Davil Nettle

Dioecious shrubs or low trees, up to 6 m tall. Branchlets spreading, semiwoody; bark gray-green; upper stems and branchlets sparsely armed with stinging hairs pointing downwards. Leaves simple, alternate; stipules brownish, caducous, ovate-lanceolate, 1.5-2.5 cm long, subleathery, puberulent abaxially; petioles 6-12 cm long, sparsely pubescent with irritant hairs; leaf blades elliptic, oblong or obovate-lanceolate, rarely rhombic, 15-40 × 5-22 cm, base cuneate, rounded, or deeply cordate, apex acute to acuminate, margins sinuate to irregularly dentate, leathery or papery, glabrous except for sparse irritant hairs on veins at the lower surface, penniveined, lateral veins 10-15 pairs,

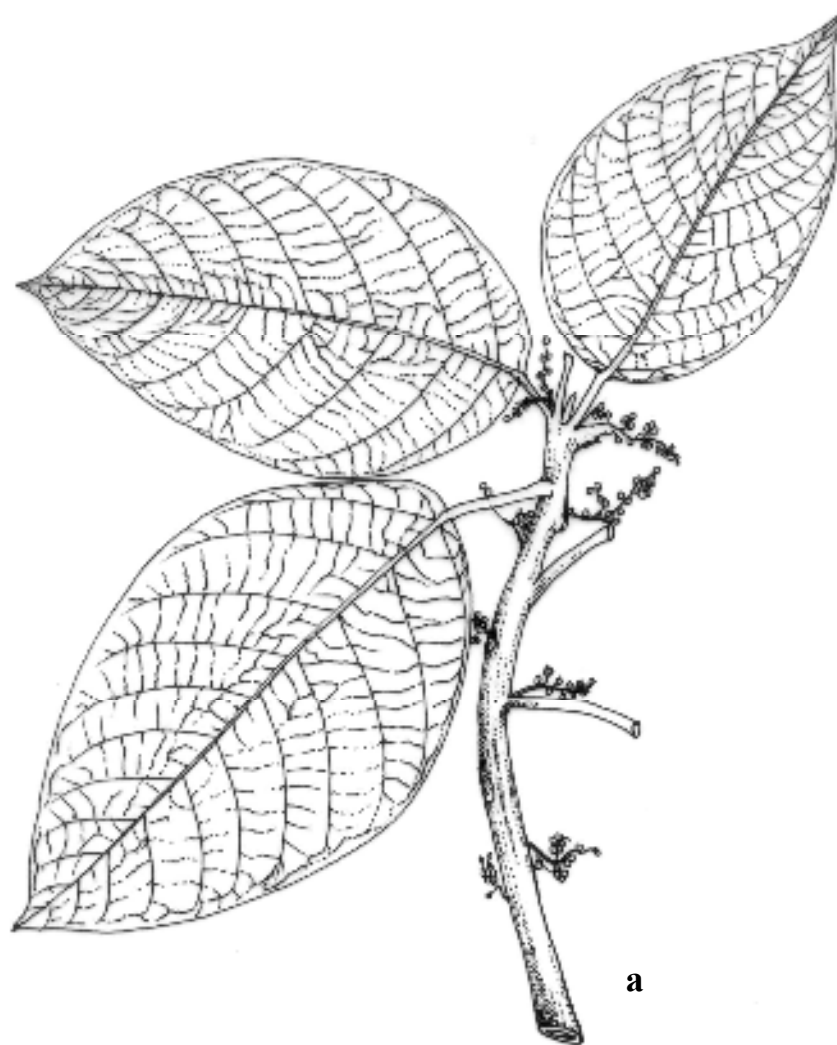


Figure 12. *Dendrocnide sinuata* (Blume) Chew: a) Flowering shoot.

cystoliths minutely punctiform, conspicuous adaxially. Inflorescence a slender panicle or dichotomously branched loose fascicles, peduncles densely covered with irritant hairs; male inflorescences in distal axils of branchlets, long paniculate, 5-10 cm; armed with stinging hairs; female inflorescences also in distal axils, 10-20 cm. Flowers unisexual, bracteolate. Male flowers: subsessile, in bud 1.2 mm long; perianth lobes 4, ovate, 2.0-2.5 × 1.0-1.5 mm, slightly covered with irritant hairs; stamens 4, on reflexed filaments; rudimentary ovary obovoid, 0.5 mm long. Female flowers: pedicels often fleshy but not swollen; perianth lobes 4, unequal, 1.0-1.5 × 0.5 mm, sparsely covered with irritant hairs; stigmas ligulate, 2-4 mm long; ovary ca. 1.5 mm long; stigma ligulate, ca. 2 mm long. Fruit an achene, asymmetrically pyriform, 4-6 × 2-4 mm, warty pericarp, persistent perianth forming a minute cupule at base, on greatly elongated pedicels. *Fl. & fr.*: 6-2. *Moist shady places in mixed forests, along roads and tracks; between 300-800 m altitudes.*

Bandarban: Ruma, near Pransapara, 25 i 1965, *M.S. Khan*, K-1119 (DUSH). **Chattogram:** Fatikchari, Hazarikhil, 11 iii 1964, *M.S. Khan*, K-796 (DUSH); Napora, Chunati, 30 xii 1989, *M.S. Khan and A.M. Huq*, K-8190 (BFRI); Koila beat, Korerhat, 31 i 1990, *Das and Alam*, 6516 (BFRI). **Chittagong Hill Tracts:** 15 ii 1940, S.K. Mukerjee 202 (CAL); 15 xii 1886, Badul Khan 166 (CAL). **Dhaka:** Dhaka University Botanic Garden, 9 xi 1946, *S.K. Sen*, 14 (DUSH). **Maulvibazar:** Juri, Lathitilla, 30 xi 1983, *M.K. Alam*, 4771 (BFRI). **Sylhet:** Locality and date unknown, JD Hooker & Thomson, (CAL 432095); 7 v 1941, *S.K. Sen*, 56 (DUSH).

India, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia and China.

Root juice is used in long-standing fever. Seeds are used in the same way as coriander. Flowers and leaves are poisonous and may cause death (Kirtikar and Basu, 2012). Bark fibre is used to make ropes. Decoction of roots and leaves are used in remedy for swollen limbs and scabies respectively (Ullah, 2009). The sting of the plant causes pain that lasts for 7-14 days and is renewed on contact with water (Heinig, 1925).

Elatostema Forst., Char. Gen. 105. t. 53. 1776.

Type species: *Elatostema sessile* J.R. Forst. & G. Forst.

Monoecious or dioecious shrubs, subshrubs, or herbs, without stinging hairs. Leaves alternate, sessile or subsessile, distichous; nanophylls present or absent, opposite to normal leaves; stipules 2, intrapetiolar; leaf blades simple, usually oblique, often 3-veined from the base, sometimes pinnately-veined, cystoliths linear or fusiform. Inflorescences mostly many-flowered or rarely 1-3-flowered discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles; usually pedunculate, very rarely sessile, unisexual; male inflorescences usually with discoid receptacle, rarely cymose; female ones with discoid receptacle and bracteoles along margin. Flowers minute. Male flowers: perianth lobes 4 or 5, elliptic, usually corniculate or short horned below apex, connate at base; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small or absent. Female flowers: perianth lobes 4 or 5, or reduced, less than half length of ovary, free or connate at base, not corniculate at apex; staminodes 3-5, linear; ovary superior, straight, ellipsoid, 1-celled; style absent; stigma penicillate; ovule orthotropous. Fruit an ovoid or fusiform achene, slightly flattened, mostly longitudinally 6-10-ribbed, rarely smooth or tuberculate, enclosed by the tepals. Seeds usually exalbuminous.

KEY TO THE SPECIES

- | | | |
|----|---|-------------------------|
| 1. | Male receptacle sessile or very shortly peduncled | 2 |
| + | Male receptacle usually on long peduncled | 8 |
| 2. | Leaf base almost equal | E. ellipticum |
| + | Leaf base very unequal | 3 |
| 3. | Leaf apex acuminate or caudate | 4 |
| + | Leaf apex rounded or cuspidate | E. parvum |
| 4. | Subshrub | 5 |
| + | Herb | 6 |
| 5. | Leaf blade margin entire or undulate | E. integrifolium |
| + | Leaf blade margin crenate, denticulate, dentate, or serrate | E. platyphyllum |
| 6. | Leaf becomes greenish when dry | E. sessile |
| + | Leaf becomes brown when dry | 7 |

- | | | |
|-----|---|-------------------------|
| 7. | Leaf margins deeply subpinnatifidly crenate or serrate, nerve beneath glabrous; receptacle 6-8 mm diameter | E. subincisum |
| + | Leaf margins serrate, nerve beneath strigosely; receptacle 12-25 mm diameter | E. rupestre |
| 8. | Leaves apex acuminate or caudate | 9 |
| + | Leaves apex rounded or obtuse | E. obtusum |
| 9. | Bracts of male receptacle rounded, or broadly ovate, none produced into a spur beyond the receptacle | 10 |
| + | Bracts of male receptacle very unequal, 2 or more of the outer spurred or acuminate and produced beyond the others, none produced into a spur beyond the receptacle | E. procridioides |
| 10. | Stem quite glabrous | 11 |
| + | Stem tomentose above | E. papillosum |
| 11. | Female receptacle sessile | E. dissectum |
| + | Female receptacle long peduncled | 12 |
| 12. | Receptacle 2.5-4.0 cm diameter; achene ellipsoid | E. griffithii |
| + | Receptacle 1.2-2.0 cm diameter; achene oblong | E. clarkei |

Elatostema clarkei Hook.f., Fl. Brit. Ind. 5: 569. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 723. 1903 (Indian reprint ed. 1963). Kanjilal *et al.*, Fl. Assam 4: 285. 1940 (reprint 1982); Heinig, List Chittagong: 66. 1925; Afroz in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 417. 2009. **Fig. 13.**

Perennial, glabrous herbs. Stems erect from a short creeping base, hard, succulent, angled, grooved when dry, naked below. Leaves apparently alternate, distichous; nanophylls present, opposite to normal leaves; stipules 2, linear-oblong, membranous, deciduous; blades lanceolate, elliptic-lanceolate, or elliptic-oblong, 10-15 × 2.5-4.5 cm long, base acute to acuminate, base asymmetric, apex acuminate, margins crenate-serrate, coriaceous, 3-veined, or pinnately veined, cystoliths linear or fusiform, subsessile. Inflorescences usually pedunculate, many-flowered, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles; unisexual; male and female receptacles peduncled, subglobose, involucrel bracts of male rounded and female ovate, obtuse or acute, pubescent. Male flowers: perianth lobes 4, elliptic,



Figure 13. *Elatostema clarkei* Hook.f.: a) Flowering shoot.

connate at base, usually corniculate or short horned below apex; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small or absent. Female flowers: perianth lobes 4, less than half length of ovary, free or connate at base, not corniculate at apex; staminodes 3-5, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes ovoid or ellipsoid, slightly flattened, mostly longitudinally 6-10-ribbed, rarely smooth or tuberculate. *Fl. & fr.*: 1-12. *Primary evergreen hill forests; on wet and shady rocks, along the streams.*

Bandarban: Betechar Para, 6 vi 1983, M.K. Alam, 4614 (BFRI); Ruma Bazar, 28 x 1984, *M.S. Khan et al.*, K-6739 (DACB 6123). **Chattogram:** Dohazari range, near Boitarani forest beat office, 26 xi 1970, *M.S. Khan & A.M. Huq* K-2273 (DACB 6133); Subalong, 22 ix 1980, *M.S. Khan et al.*, K-6137 (DACB 6129). **Moulvibazar:** Borolekha, Madhobkundu Eco Park, 23 ix 2011, *S.N. Uddin*, N-4847 (DACB 37246); Kamalgonj, Kamarchara Forest Beat, 21 ix 2011, *S.N. Uddin*, N-4847(2) (DACB 37247). **Mymensingh:** Mymensingh, 14 vii 1872, C.B. Clarke, 17299A (K000575284). **Rangamati:** Kaptai, Sitapahar, Sitarghat, 25 iv 1997, *M.S. Khan et al.*, K-9886 (DACB 28238); Bilaichari, Pharua Reserve Forest, 15 x 2008, *B. Khan et al.*, B-1107 (DACB 33489); Bilaichari, Pharua Reserve Forest, 15 x 2008, *S.N. Uddin*, N-3080 (DACB 33284).

India, Myanmar and Indonesia.

Elatostema dissectum Wedd., Arch. Mus. Hist. Nat. 9: 314. 1856. Hook.f., Fl. Brit. India 5: 568. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 285. 1940 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 202. 1982; Uddin *et al.*, Bull. Bangladesh National Herb. 4: 7. 2015. *Elatostema paragunshanense* W.T. Wang, Acta Bot. Yunnan. Suppl. 5: 4. 1992. **Fig. 14.**

Perennial, monoecious or dioecious herbs, 20-50 cm tall, glabrous. Stems from a shortly creeping base, stout and subsucculent or slender, ascending or erect, simple or rarely branched, lower stems brown furfuraceous. Leaves alternate, sessile or petioled; nanophylls absent; leaf blades obliquely or falcately oblanceolate or broadly oblong-ovate, 7-12 × 2.5-5.0 cm, obliquely cuneate or acute to the entire base, apex acuminate or cuspidate, coarsely crenate or serrate from the middle of the lower margin, upwards subentire, herbaceous, thick, green when dry, major basal lateral veins asymmetric,



Figure 14. *Elatostema dissectum* Wedd.: a) Flowering shoot.

basal, the other arising above base, cystoliths numerous, minute, slender; stipules lateral, narrowly subulate or lanceolate, 3-5 × 0.1-0.3 mm, with cystoliths; petiole 0-1 mm long. Male receptacles solitary, simple, elliptic or nearly oblong, 1.0-2.4 × 0.8-1.0 cm, lobed or lacerate often to the base exposing the flowers; lobes fleshy, fringed with small ovate acute glabrous bracts; flowers large, 4-merous, pedicelled, 1-2 sepals spurred; peduncle 1.5-8.0 cm long; bracts connate, 2.0-2.5 mm long; bracteoles linear. Female receptacles much smaller, depressed, 5-9 mm diameter; sessile or peduncle 0-1 mm long; bracts lanceolate; bracteoles nearly linear, ciliate. Achenes ellipsoid, subcompressed, rather fleshy, not ribbed or striate. *Fl. & fr.*: 1-6. *Hilly evergreen forests, riverine forests, or valley forests; up to 500 m altitudes.*

Rangamati: Mynimukh, 25 xii 1956, M.S. Khan, K-215 (CAL); 25 xii 1956, M.S. Khan, K-215 (DUSH); 15 i 1912, Capt. S.M. Toppin R.A. 6101 (CAL 433318).

Bhutan, India, Laos, Thailand and China.

Elatostema ellipticum Wedd., Prodr. 16 (2): 186. 1868. Hook.f., Fl. Brit. India 5: 574. 1888 (Indian repr. 1954); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 8. 2015. **Fig. 15.**

Annual or perennial, dioecious herbs, up to 60 cm long, without stinging hairs. Stem slender, creeping, rooting at branches, quite glabrous. Leaves alternate, simple; nanophylls absent; leaf blade fleshy, elliptic-ovate or ovate, 1.2-4.0 × 1.2-2.5 cm, base nearly equilateral, rounded or subcordate, tri-nerved, apex acute or obtuse, margins quite entire, rigid when dry; cystoliths minute on the upper surface only; stipules 2, small, ovate-lanceolate; petiole 2-5 mm long. Inflorescences usually pedunculate, mostly many-flowered discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles; unisexual. Male receptacles solitary, ovoid, 8 mm diameter, shortly peduncled; female ones with discoid receptacle and bracteoles along margin. Male flowers: perianth lobes 4, elliptic, connate at base, usually corniculate or short horned below apex; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small. Female flowers: perianth lobes 4, free or connate at base, not corniculate at apex; staminodes 4, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovules orthotropous. Achenes ellipsoid, slightly flattened, mostly longitudinally ribbed. *Fl. & fr.*: 1-12. *Shady and wet rocks, in primary evergreen forests; up to 500 m altitudes.*



Figure 15. *Elatostema ellipticum* Wedd.: a) Vegetative shoot.

Chattogram: Hazarikhil Reserved Forest, 3 xi, 2015, K.K. Islam *et al.*, KKI-25 (DACB). **East Bengal:** Locality and date unknown, Griffith, 4583 (Holotype K000741065). **Dhaka:** National Botanical Garden, 11 xii 2013, E.H. Khokan, MHK-42 (DACB). **Moulvibazar:** Lathitila, Barolekha, 28 iii 2016, K.K. Islam *et al.*, KKI-128 (DACB). **Rangamati:** Barkal Reserve Forest, 5 xii 2015, K.K. Islam *et al.*, KKI-56 (DACB).

India.

Elatostema griffithii Hook.f., Fl. Brit. India 5: 569. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 285. 1940 (reprint 1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 9. 2015. **Fig. 16.**

Perennial, dioecious herbs, up to 20-30 cm tall, without stinging hairs. Stem glabrous, stout, erect from a densely matted fibrous root, probably fleshy. Leaves sessile, alternate, distichous; nanophylls absent; leaf blades obliquely oblanceolate, 12-15 cm long, base narrowly acute, asymmetric, 3-veined, apex acuminate, margins obtusely serrate from near the base penninerved, coriaceous, green when dry, basal nerves reaching about half-way; cystoliths minute, abundant above and on the nerves beneath; stipules 2, linear, 1.0-1.5 mm long, acute, hyaline. Inflorescences usually pedunculate, mostly many-flowered discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles. Male receptacles 2.5-4.0 cm diameter; bracts confluent in a fleshy disk, with crenulate margins, branching nerves; peduncles 2.5-6.5 cm long; bracteoles ciliate, membranous, outer broadly oblong, inner narrower or subspathulate, those towards the disk deformed very short; female receptacles long-peduncled, large fleshy, irregularly lobed with crenulate ciliate margins. Male flowers: perianth lobes 4, elliptic, connate at base; stamens 4, opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small. Female flowers: female flowers very shortly pedicelled, perianth lobes 4, free or connate at base; staminodes 4, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovules orthotropous. Achenes ellipsoid, acute at both ends, mostly longitudinally 6-8-ribbed. *Fl. & fr.*: 7-11. *Hilly evergreen forests, along streams; up to 600 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4537 (K 000741067).

India.



Figure 16. *Elatostema griffithii* Hook.f.: a) Flowering shoot.

Elatostema integrifolium (D. Don) Wedd. in Candolle, Prodr. 16(1): 179. 1869. *Procris integrifolia* D. Don, Prodr. Fl. Nepal. 61. 1825. *Procris sesquifolia* Reinw. ex Blume, Bijdr. Fl. Ned. Ind. 10: 511. 1825. *Procris piperifolia* Wall., Numer. List 4628. 1831. *Elatostema cuspidiferum* Miq., Pl. Jungh. 22. 1851. *Elatostema sesquifolium* (Reinw. ex Blume) Hassk., Cat. Hort. Bogor.: 79. 1854. Hook. f., Fl. Brit. India 5: 564. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 722. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 66. 1925; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 202. 1982; Kanjilal *et al.*, Fl. Assam 4: 284. 1940 (reprint 1982); Afroz in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 419. 2009. *Elatostema zollingerianum* Wedd., Ann. Sci. Nat., Bot. IV, 1: 188. 1854. *Elatostema pulgarensense* Elmer, Leafl. Philipp. Bot. 5: 1846. 1913. *Elatostema viridicaule* W.T. Wang, Bull. Bot. Res., Harbin 3(3): 62. 1983. **Fig. 17.**

Perennial, monoecious or dioecious herbs or subshrubs, up to 2 m tall. Stems erect, branched, terete, lower woody, glabrous. Leaves alternate, glabrous; nanophylls absent; stipules narrowly lanceolate, 6-10 × 1.5-2.0 mm, with cystoliths; petiole 1.5-6.0 (-10) mm long; leaf blades obliquely elliptic to obliquely oblanceolate, 5-25 × 2-8 cm, base obliquely cuneate, apex acuminate or caudate, margin entire or bi-dentate, papery or herbaceous, main basal nerves asymmetric, nerves 3-5 pairs, arched, cystoliths conspicuous, dense. Inflorescence a small head, often lobed or branched, male and female in the same or separate axils or plants. Male inflorescences solitary or in pairs, simple, 10-18 × 6-12 mm, sessile; receptacle 4-6 mm in diameter; bracts connate, ca. 1 mm long; bracteoles cymbiform. Female inflorescences solitary or in pairs, 5-8 mm in diameter; peduncle 0-1 mm long; receptacle very small; bracts triangular; bracteoles narrowly linear. Male flowers 4-merous. Achenes ellipsoid, 8-ribbed. *Fl. & fr.*: 3-5. *Valley forests, along streamsides; between 300-600 m altitudes.*

Bandarban: Balaghata, Bandarban sadar, 9 vi 1983, M.K. Alam, 4647 (BFRI). **Chattogram:** Hazarikhil, Baraiyadhala, 14 iii 1964, M.S. Khan, K-825 (DUSH); R.S. Forest Range, Hazarikhil, Baraiyadhala, 14 iii 1964, M.S. Khan, K-825 (DUSH); Ghagra, 27 iv 1976, *A.M. Huq et al.*, H-2492 (DACB 6252); Sitakundu, Chandranath Hill, 22 vi 1979, *Mia & Rahman*, M-85 (DACB 6128); Barkal Reserved Forest, 12 vi 1983, *A.M. Huq et al.*, H-5749 (DACB 6122); Alikadam, Kalapahar, 21 iv 1994, *A.M. Huq & M.K. Mia*, H-10309 (DACB 26329). **Chittagong Hill Tracts:** 15 ii 1940, S.K. Mukerjee, 196 (CAL). **Moulvibazar:** Borolekha, Madhabkundo Eco-park, 20 v 2014, *S.N. Uddin*, N-5260 (DACB 43676). **Rangamati:** Barkal Reserved Forest, 12 vi 1983, *A.M. Huq et al.*, H-5749 (DACB); Sita Pahar (west) Kaptai, 26 iv 1997, *M.S. Khan et al.*, K-9905 (DACB 28163).



Figure 17. *Elatostema integrifolium* (D.Don) Wedd.: a) Flowering shoot.

Bhutan, India, Nepal, Myanmar, Thailand, Indonesia, Malaysia and China.

Elatostema obtusum Wedd., Ann. Sci. Nat., Bot., sér. 4, 1: 190. 1854. Hook.f., Fl. Brit. India 5: 573. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 285. 1940 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3:203 (1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 10. 2015. *Dorstenia pubescens* Blanco, Fl. Filip. 692. 1837. *Elatostema delicatulum* Wedd., Ann. Sci. Nat., Bot. IV, 1: 190. 1854. **Fig. 18.**

Perennial, dioecious herbs, 10-50 cm tall, without stinging hairs. Stems ascending or creeping, branched or simple, nearly glabrous, very sparsely retrorse-hirtellous, or crispately strigose. Leaves alternate; nanophylls absent; stipules 2, lanceolate-linear, 2-3 × 0.1-0.2 mm, glabrous, without cystoliths; petiole 0-1.5 mm; leaf blades obliquely obovate, obliquely obovate-elliptic, or oblong-obovate, 0.5-1.5 (-3) × 0.5-1.2 (-1.6) cm, herbaceous, 3-veined, major basal lateral veins both arising at base of leaf blade, both surfaces glabrous or adaxial surface sparsely strigillose; cystoliths conspicuous or obscure, dense; base asymmetric, with broader half cordate, margin dentate, apex obtuse or rounded. Inflorescences usually pedunculate, mostly many-flowered or rarely 1-3-flowered discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles. Male inflorescences solitary, simple, 4-7 mm in diameter; peduncle 0.2-2(-6.5) cm long; receptacle very small; bracts connate, ca. 2.5 mm long; bracteoles absent. Female inflorescences solitary, 1(or 2)-flowered, 2-3 mm in diameter, sessile; receptacle absent; bracts lanceolate; bracteoles absent. Male flowers: perianth lobes 4 or 5, elliptic, connate at base, usually corniculate or short horned below apex; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small or absent. Female flowers: perianth lobes 4 or 5, or reduced, less than half length of ovary, free or connate at base, not corniculate at apex; staminodes 3-5, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes narrowly ovoid, slightly flattened, smooth. *Fl. & fr.*: 6-10. *Hilly forests, rocky place along the stream; up to 700 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4534 (CAL 433418).

Bhutan, India, Nepal, Philippines, Thailand and China.

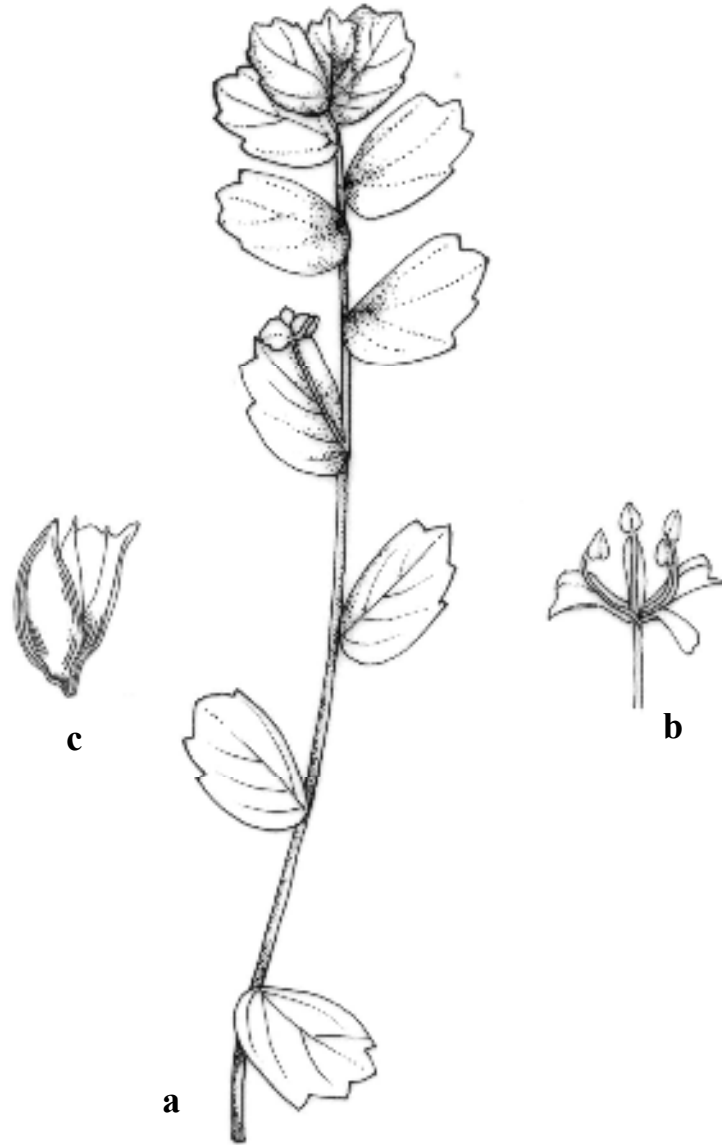


Figure 18. *Elatostema obtusum* Wedd.: a) Flowering shoot; b) Male flower; c) Infructescence.

Elatostema papillosum Wedd., Arch. Mus. Hist. Nat. 9: 327. 1856. Hook.f., Fl. Brit. India 5: 569. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 722. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 66. 1925. Kanjilal *et al.*, Fl. Assam 4: 279. 1985 (reprint 1982); Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 417. 2009. **Fig. 19.**

Monoecious or dioecious, perennial herbs, up to 50 cm tall. Stems simple or branched, erect from the swollen or shortly inclined base, fleshy, pubescent. Leaves alternate, sessile or shortly petioled; nanophylls ovate to cordate, 4-10 mm long; stipules linear-lanceolate, 5-7 × 0.5-0.7 mm, glabrous, cystoliths microscopic or absent; petiole 1-5 mm long; leaf blades obliquely elliptic or obovate, 5-15 × 2-6 cm, base with broader half broadly cuneate or nearly auriculate, apex cuspidate or caudate, margin crenate, papery, major basal lateral nerves both arising at base of leaf blade or 1 arising above base, not extending beyond middle of leaf blade, lower surface puberulent along nerves, upper surface glabrous, cystoliths conspicuous or obscure. Male inflorescences solitary, simple, 1.2-2.5 × 1.0-1.5 cm; peduncles 2-5 cm long; receptacles elliptic, 1.0-2.5 × 1.0-1.4 cm; bracts connate, 5-12 mm wide; bracteoles linear-oblong, ciliate. Female inflorescences solitary, 4-6 mm in diameter; peduncles ca. 1 mm long; receptacles nearly orbicular, 3-5 mm in diameter; bracts triangular; bracteoles lanceolate-linear. Male flowers 4-merous. Fruits achenes, ellipsoid, acute at both ends, acutely ribbed. *Fl. & fr.*: 6-11. *Evergreen broad-leaved forests; between 300-900 m altitudes.*

Chattogram: Dohazari, Lalutia, Himchhari, 10 vi 2001 *S.N. Uddin*, N-958 (DACB 34066); Dohazari, Dhopachari, Chattanchari 11 vi 2011, *S.N. Uddin*, N-980 (DACB 34046). **East Bengal:** Locality & date unknown, Griffith 4552 (CAL). **Moulvibazar:** Borolekha, Madhobkundu Eco-Park, 20 v 2014, *S.N. Uddin*, N-5278 (DACB 43690). **Rangamati:** Kassalong, 1876, J.K. Lister (CAL 433355); Sitapahar, Kaptai, 17 vi 2001, *S.N. Uddin*, N-1063 (DACB 36212).

Bhutan, India and China.

Elatostema parvum (Blume) Miq. in Zollinger, Syst. Verz. 102. 1855. *Procris parva* Blume, Bijdr. Fl. Ned. Ind. 512. 1826. *Elatostema stracheyanum* Wedd., Ann. Sci. Nat., Bot. IV, 1: 188. 1854; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 203. 1982. *Elatostema reptans* Hook.f., Fl. Brit. Ind. 5: 567. 1888; Prain, Beng. Pl. 2: 722. 1903 (Indian reprint ed. 1963);



Figure 19. *Elatostema papillosum* Wedd.: a) Flowering shoot; b) Female flower with bracteoles.

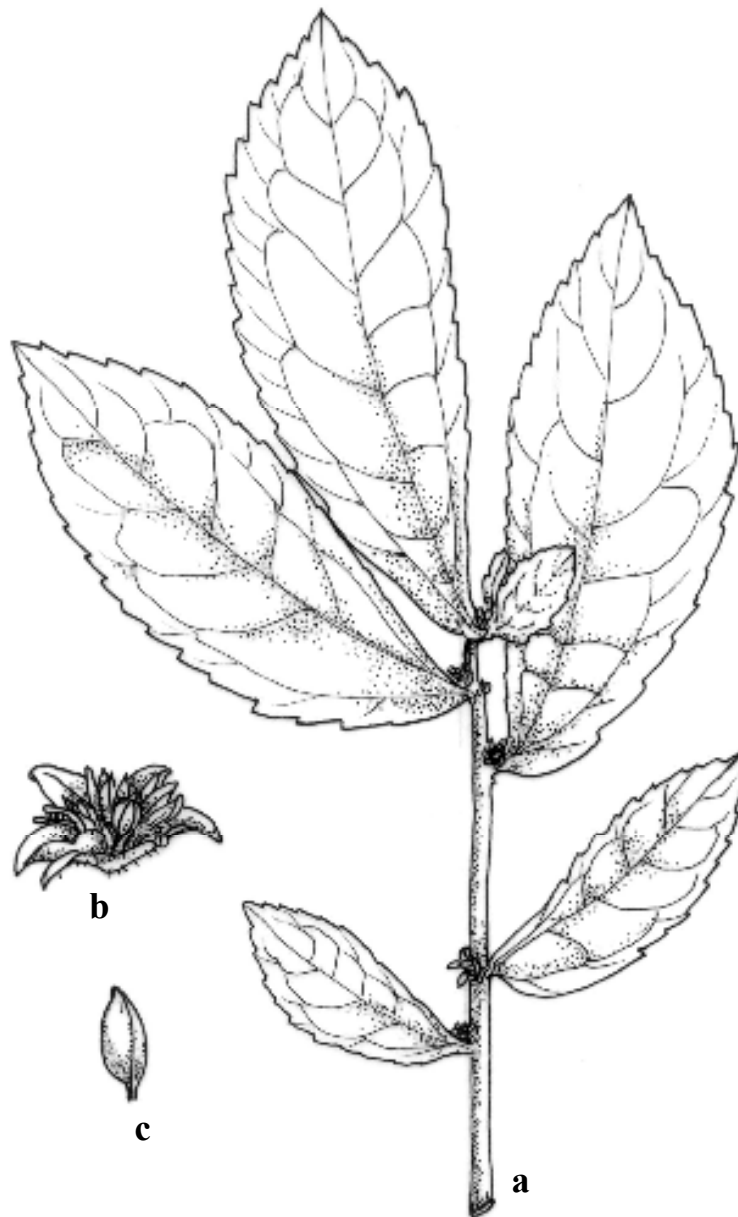


Figure 20. *Elatostema parvum* (Blume) Miq.: a) Flowering shoot; b) Female inflorescence; c) Achene.

Heinig, List Chittagong: 66. 1925; Afroz in Ahmed *et al.*, *Encycl. Fl. Fauna Bangladesh* 10: 418. 2009. *Elatostema minutum* Hayata, *J. Coll. Sci. Imp. Univ. Tokyo* 25(19): 198. 1908. *Elatostema merillii* C.B. Rob., *Philipp. J. Sci., C*, 6: 305. 1911. *Pellionia esquirolii* H. Lév., *Repert. Spec. Nov. Regni Veg.* 11(304-308): 551-552. 1913. *Elatostema backeri* H. Schroet., *Repert. Spec. Nov. Regni Veg. Beih.* 83(2): 155. 1936. *Elatostema backeri* var. *villosulum* W.T. Wang, *Acta Phytotax. Sin.* 28: 312. 1990. **Fig. 20.**

Monoecious or dioecious, perennial, suffruticose herbs, 25-65 cm long. Stems ascending, branched, densely retrostrigose. Leaves alternate; nanophylls oblong, 3-9 mm long; stipules lanceolate or linear, 4-7 × 1.0-1.2 mm, glabrous, with cystoliths; petiole 0-1 mm long; leaf blades obliquely obovate, obliquely oblanceolate, or oblong, 2-8 × 0.5-2.5 cm, base with broader half rounded, apex acuminate, acute, or shortly cuspidate, margin serrate with 7-20 teeth, herbaceous, major basal and lateral nerves arising at base of leaf blade or 1 arising above base, lower surface strigillose along veins, upper surface sparsely strigillose or glabrescent, cystoliths conspicuous, dense. Male inflorescences solitary or in pairs, simple, 3-5 mm in diameter, sessile; receptacle obscure; bracts connate, 4-6 mm wide; bracteoles narrowly ovate, lanceolate, or linear. Female inflorescences solitary or in pairs, broadly elliptic, 4-6 mm wide, sessile; receptacle small; bracts narrowly lanceolate or subulate. Male flowers 5-merous. Achenes ovoid, ribbed. *Fl. & fr.*: 2-8. *Hilly evergreen forests, rock crevices, streamsides; between 500-800 m altitudes.*

Chattogram: Pruskul, 13 ii 1873, C.B. Clarke, 19852A (K000741197).

Bhutan, Nepal, India, Myanmar, Indonesia, Philippines and China.

Elatostema platyphyllum Wedd., *Arch. Mus. Hist. Nat.* 9: 301. 1856. *Elatostema ebracteatum* W.T. Wang, *Acta Phytotax. Sin.* 28: 316. 1990. *Elatostema edule* C.B. Rob., *Philipp. J. Sci., C*, 5: 531. 1910 publ. 1911. *Elatostema platyphylloides* B.L. Shih & Yuen P. Yang, *Bot. Bull. Acad. Sin. n.s.*, 36: 158. 1995. *Elatostema platyphyllum* var. *polycephalum* Hara in *Fl. E. Himal.* 3rd. Repr.: 22. 1975. **Fig. 21.**

Dioecious undershrubs, 80-140 cm tall, glabrous. Stems erect, branched. Leaves alternate; nanophylls absent; stipules lanceolate, 2-4 × 0.3-0.8 cm, with cystoliths; petiole 2-5 mm long; leaf blades obliquely elliptic or narrowly elliptic, 15-30 × 5-10 cm, base with broader half auriculate, margin denticulate, apex acuminate or caudate-acuminate,

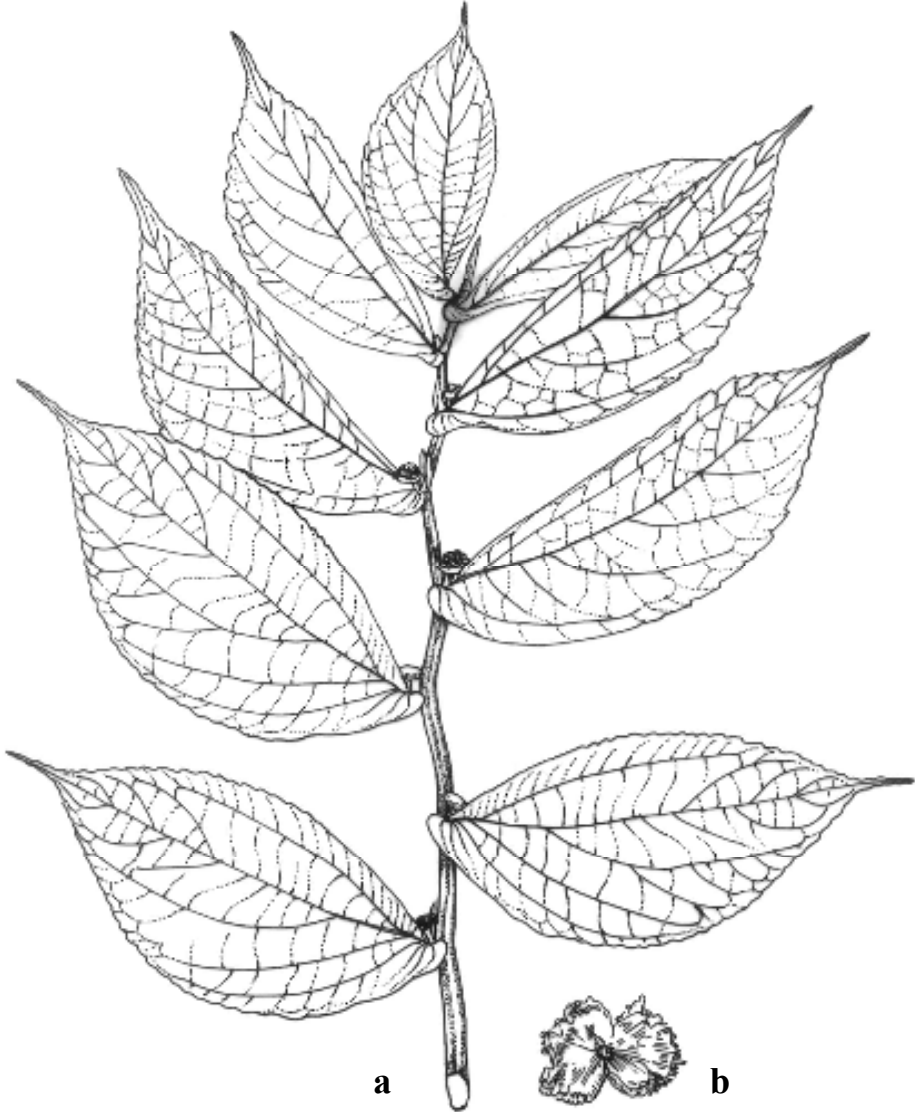


Figure 21. *Elatostema platyphyllum* Wedd.: a) Flowering shoot: b) Female inflorescence.



Figure 22. *Elatostema procridioides* Wedd.: a) Flowering shoot; b) Male inflorescence (bottom view); c) Female inflorescence (bottom view).

herbaceous, major basal lateral veins both arising at base of leaf blade or 1 arising above base, sometimes not extending beyond middle of leaf blade, cystoliths conspicuous or obscure, dense. Male inflorescences solitary or in pairs, simple, 10-25 × 5-15 mm; peduncle 0.5-1.0 mm long; receptacle nearly papilionaceous, 10-25 × 5-16 mm; bracts connate, narrowly ovate, obscure; bracteoles spatulate-oblong. Female inflorescences solitary, nearly oblong, 5-7 × 2-5 mm; peduncle ca. 5 mm long; receptacle 5-7 × 2-5 mm; bracts narrowly ovate; bracteoles spatulate. Male flowers 4-merous. Fl. & fr.: 3-10. *Evergreen hilly forests, shaded areas along streamsides; between 500-1000 m altitudes.*

Bandarban: Tonkaboti Forest, Bandarban Sadar, 28 xii 2016, Hossen *et al.*, IH 2773 (DACB).

China, Bhutan, Japan, India, Nepal, the Philippines.

Elatostema procridioides Wedd. in Candolle, Prodr. 16 (1): 180. 1869. Hook.f., Fl. Brit. India 5: 570. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 285. 1940 (reprint 1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 11. 2015. *Elatostema treutleri* Hook.f., Fl. Brit. India 5: 571. 1888. *Elatostema beshengii* W.T. Wang, Acta Phytotax. Sin. 28: 319. 1990. **Fig. 22.**

Perennial, dioecious herbs, 30-80 cm tall, glabrous, without stinging hairs. Stems ascending or erect, simple. Leaves alternate, nanophylls absent; leaf blades obliquely oblong or obliquely obovate-oblong, 8-19 × 3-7 cm, base asymmetric, obliquely cuneate, margin denticulate, apex acuminate, papery, 3-veined, two lateral veins sometimes inserted above the base, cystoliths conspicuous, dense; stipules 2, lanceolate-linear, 14-22 × 2-3.5 mm, with cystoliths; petiole 2-6 mm long. Inflorescences usually pedunculate, mostly many-flowered or rarely 1-3-flowered discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles, unisexual. Male inflorescences solitary, simple, 14-17 × 10-12 mm; peduncle 13-25 mm long; receptacle oblong or broadly elliptic, 13-15 × 5-8 mm; bracts connate, 6-10 mm; bracteoles linear. Female inflorescences solitary, 7-13 × 4-7 mm; peduncle ca. 4 mm long; receptacle elliptic, 7-12 × 4-6 mm; bracts ovate or triangular; bracteoles oblanceolate-linear. Male flowers: perianth lobes 4, elliptic, connate at base, usually corniculate or short horned below apex; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small or absent. Female flowers: perianth



Figure 23. *Elatostema rupestre* (Buch.-Ham. ex D.Don) Wedd.: a) Flowering plant.

lobes 4 or reduced, less than half length of ovary, free or connate at base, not corniculate at apex; staminodes 4, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes ellipsoid, slightly flattened, 6-ribbed. *Fl. & fr.*: 1-4. *Evergreen broad-leaved forests, along stream sides; up to 600 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4543 (CAL 14615).

India and China.

Elatostema rupestre (Buch.-Ham. ex D. Don) Wedd., Arch. Mus. Hist. Nat. 9: 304. 1856. Hook.f., Fl. Brit. India 5: 564. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 722. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 66. 1925; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 203. 1982; Kanjilal *et al.*, Fl. Assam 4: 284. 1940 (reprint 1982); J.Sinclair, Fl. Cox's Bazar: 107. 1956; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 418. 2009. *Procris rupestris* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 60. 1825. *Elatostema zollingerianum* Miq., Syst. Verz. 101. 1855. **Fig. 23.**

Local name: *Lata-phuti*

Perennial, dioecious herbs, up to 60 cm high. Stems erect or ascending, simple, densely strigose hairy. Leaves alternate, subsessile or shortly petioled; nanophylls absent; stipules linear-lanceolate, 10-18 × 3-5 mm, acuminate, sparsely strigose, with cystoliths; petiole 1.5-5.5 mm long; blade obliquely elliptic or obovate-elliptic, 10-15 × 3-6 cm, base with broader half obtuse, apex acuminate, margins dentate or caudate-serrate from above to the middle, herbaceous, main basal nerves asymmetric, 1 basal, the other arising above base, lower surface sparsely strigose along nerves, upper surface sparsely hirsute, cystoliths conspicuous, dense. Receptacles sessile or subsessile, 1.2-2.5 cm in diameter, involucre bracts of male flower rounded, pubescent or villous; female inflorescences solitary, 6-10 mm in diameter; peduncle ca. 1 mm long; receptacle nearly quadrate, 5-9 mm long; bracts triangular; bracteoles spatulate or linear, tomentose. Fruits achenes, minute, ovoid, 8-ribbed. *Fl. & fr.*: 5-7. *Valley forests; between 400-800 m altitudes.*

Chattogram: Kaptai Lake, 25 i 1973, M.S. Khan & A.M. Huq, K-2719 (DACB 6131); Manikchari, 25 vi 1976, A.M. Huq *et al.*, H-2355 (DACB 6130); Bandarban, 3 vi 1977, A.M. Huq & M. Rahman, H-3342 (DACB 6132). **Cox's Bazar:** Signal Hill, 15 iii



Figure 24. *Elatostema sessile* J.R.Forst. & G.Forst.: a) Flowering plant.

1945, J. Sinclair 4023 (CAL 554009); Teknaf, 14 xii 1984, M.S. Khan *et al.*, K-6947 (DACB 6125). **Moulvibazar:** Kamalgonj, Adampur, 20 v 2014, S.N. Uddin, N-5259 (DACB 43675). **Rangamati:** Kamalarchari, Kaptai, 14 vi 1987, M.K. Alam, 5836 (BFRI); Sitapahar, Kaptai, 17 vi 2001, S.N. Uddin, N-1071 (DACB 36235); Rampahar, Kaptai, Bilaichara, 28 v 2003, S.N. Uddin, N-1865 (DACB 36759). **Sylhet:** Patharia, Madhabkundu, 28 iii 1981, M.S. Khan *et al.*, K-6245 (DACB 6132).

Nepal, India and China.

Elatostema sessile J.R.Forst. & G.Forst., Char. Gen. Pl. 53. 1775. Hook.f., Fl. Brit. India 5: 563. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 284. 1940 (reprint 1982); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 203. 1982; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 419. 2009. *Dorstenia pubescens* G.Forst., Fl. Ins. Austr. 11. 1786. *Elatostema pubescens* Pers., Syn. Pl. 2: 557. 1807. *Sciophila sessilis* (J.R. Forst. & G.Forst.) Gaudich., Voy. Uranie 493. 1830. *Procris sessilis* (J.R.Forst. & G.Forst.) Hook. & Arn., Bot. Beechey Voy. 70. 1832. *Langeveldia sessilis* (J.R.Forst. & G.Forst.) Setchell, Univ. Calif. Publ. Bot. 12: 168. 1926. **Fig. 24.**

Gregarious, annual herbs, up to 60 cm tall. Stems simple, glabrous or pubescent, usually prostrate, rooting below, branchlets zig-zag, succulent, sap watery. Leaves alternate; sessile or shortly petioled; blade obliquely lanceolate, oblanceolate or oblong-cordate, 10-20 × 3-4 cm, base obtuse, apex acute to long-acuminate, coarsely serrate from the base to the tip, membranous, blackish green when fresh, greenish when dry, shining above, paler beneath, cystolith very abundant specially above; stipules lanceolate. Inflorescences axillary, densely crowded, sessile or shortly peduncled heads; receptacle solitary or 2-3 together, fleshy, quadrangular, 6-12 mm diameter; peduncle 10-13 mm long in female flower; unisexual flowers subtended by free bracts in the staminate and fused ones in the pistillate fleshy receptacles. Involucral bracts of male flowers broadly ovate or rounded, coriaceous; bracteoles very minute, villous, hyaline. Male flowers: tepals 4, ovate, dorsally appendaged; stamens 4. Female flowers: tepals 4, dentate; ovary 1-celled, ovule 1, stigma penicillate. Fruits achenes, very minute, ellipsoid to ovoid, acute at both ends, ribbed. $2n = 26, 32, 52$ (Kumar and Subramaniam, 1986). *Fl. & fr.:* 5-10. *Shady moist rocks along streams in hilly forests.*



Figure 25. *Elatostema subincisum* Wedd.

Nepal, Bhutan, India, Myanmar, China and Peninsular Malaysia. In Bangladesh, this species was reported from Sylhet district by Hooker (1888).

Leaves are used in the treatment of severe abdominal disorders.

East Bengal: Locality & place unknown, 15 v 1988, Panigrahi (CAL 15626).

Elatostema subincisum Wedd., Arch. Mus. Hist. Nat. 9: 314. 1856. Hook.f., Fl. Brit. India 5: 566. 1888 (Indian repr. 1954); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 203 (1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 12. 2015. **Fig. 25.**

Perennial, dioecious, erect herbs, up to 30 cm tall, without stinging hairs. Stems usually slender, simple or branched, glabrous. Leaves alternate, sessile, simple; leaf blades obliquely oblong-lanceolate, 2.5-6.5 × 1.5-2.5 cm, base sub-auricled on the lower margin, apex acuminate or cuspidate, margins deeply sub-pinnatifidly crenate or serrate, hispid, membranous, nerves 3-4 pairs above the basal, cystoliths very minute, brown when dry; stipules 2, linear-lanceolate, 5-6 mm long, persistent. Inflorescences usually pedunculate, mostly many-flowered, discoid capitula, capitula usually 2-valved, each valve with several glomerules of several flowers and subtended by a few bracteoles. Male receptacle sessile or sub-sessile, 3-7 mm in diameter, many flowered; involucre bracts oblong-ovate, hardly exceeding the flowers, outer ones stoutly mucronate, inner keeled; female ones with discoid receptacle and bracteoles along margin, bracts membranous, bracteoles ciliate. Male flowers: perianth lobes 4, elliptic, connate at base, usually corniculate or short horned below apex; stamens as many as and opposite to perianth lobes; filaments of stamens inflexed in bud; rudimentary pistil small. Female flowers: perianth lobes 4, less than half length of ovary, free or connate at base, not corniculate at apex; staminodes 3-5, linear. Ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes ellipsoid, ribbed. *Fl. & fr.*: 9-11. *Hilly evergreen forests, along the streams; up to 1000 m altitudes.*

Chattogram: Chattogram, 5 x 1870, *C.B. Clarke*, 12686 (CAL).

India (Sikkim).

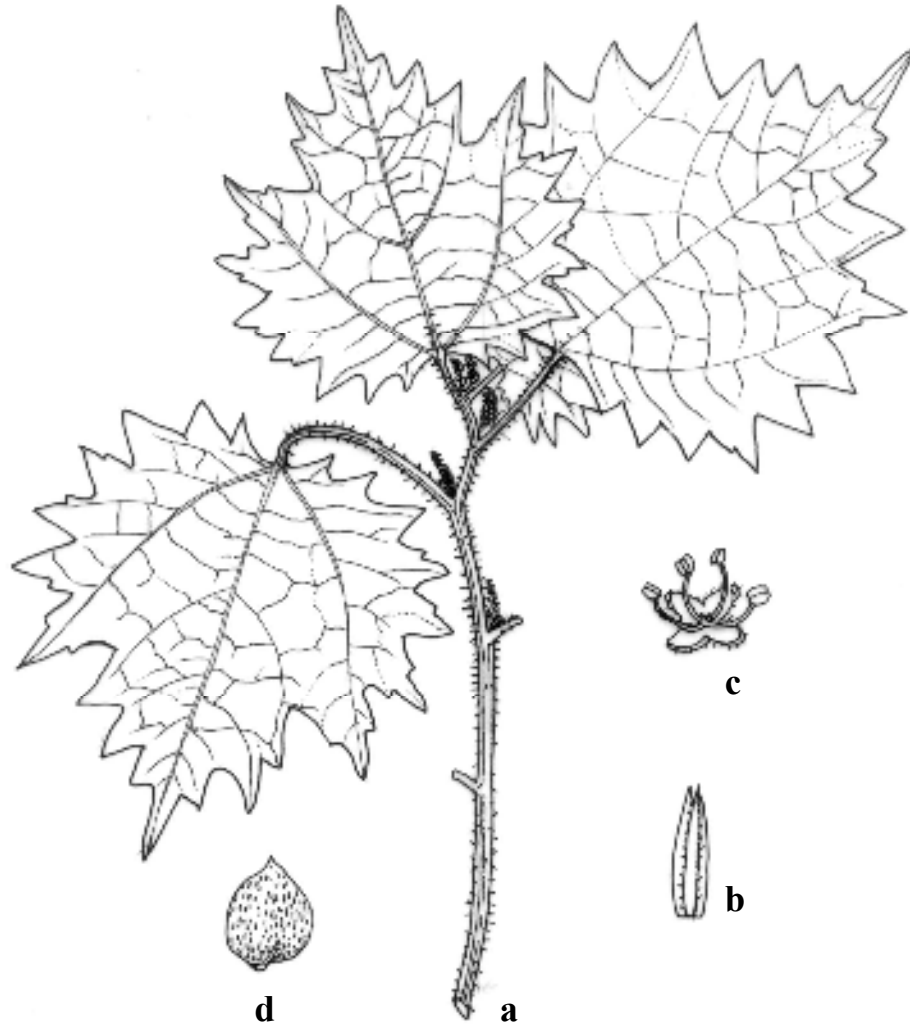


Figure 26. *Girardinia diversifolia* (Link) Friis: a) Flowering shoot; b) Stipule; c) Male flower; d) Achene.

Girardinia Gaudich., Voy. Uranie Bot.: 498. 1830.

Type species: *Girardinia leschenaultiana* Decne.

Annual or perennial, monoecious or dioecious, robust herbs, armed with stinging hairs, sometimes more than 5 mm long. Stems sympodial, upper stem often zigzag, 5-angled. Leaves alternate, stipules intrapetiolar, connate, often broad, foliaceous, caducous; petiolate; leaf blade 3-nerved, margins dentate or lobed, cystoliths punctiform. Inflorescences solitary or in axillary pairs, paniculate cymes or spikes, unisexual; male inflorescences often long, flowers clustered on rachis of spikes, dichotomous cymes or panicles; female glomerules lax or dense on rachis of scorpioid cymes, spikes or panicles. Male flowers: perianth lobes 4 or 5, valvate, filaments inflexed in bud, rudimentary ovary conspicuous. Female flowers: perianth lobes 4, 2 or 3 lobes connate into a tube, 2-3 toothed, split to the base on one side, sometimes with a small bristle-like segment; staminodes absent; ovary straight, ovoid, stigmas subulate, papillose on one side, persistent stigmas usually reflexed, ovules orthotropous. Achenes large, slightly oblique, often compressed, verrucose; pedicels simple or swollen. Seeds with thin or without endosperm, cotyledons broad.

Girardinia diversifolia (Link) Friis, Kew Bull. 36: 145. 1981. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 203-204. 1982; Huq in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 420. 2009. *Urtica diversifolia* Link, Enum. Hort. Berol. Alt. 2: 385. 1822. *Urtica palmata* Forssk., Fl. Aegypt.-Arab. 159. 1775. *Urtica heterophylla* Vahl, Symb. Bot. 1: 76. 1790. Hook.f., Fl. Brit. India 5: 550. 1888 (Indian repr. 1954); Heinig, List Chittagong: 66. 1925. *Urtica incisa* B. Heyne ex Wall., Numer. List 4603. 1831. *Girardinia heterophylla* (Vahl.) Decne., Voy. Inde 4: 151. 1844. Kanjilal *et al.*, Fl. Assam 4: 282. 1940 (reprint 1982). *Girardinia erosa* Decne., Voy. Inde 4: 151. 1844. *Girardinia leschenaultiana* Decne., Voy. Inde 4: 152. 1844. *Girardinia zeylanica* Decne., Voy. Inde 4: 152. 1844. *Girardinia hibiscifolia* Miq., Pl. Jungh. 31. 1851. *Girardinia adoensis* (Steud.) Wedd., Ann. Sci. Nat., Bot. III, 18: 203. 1852. *Girardinia javanica* Wedd., Ann. Sci. Nat., Bot. IV, 1: 181. 1854. *Girardinia vitifolia* Wedd., Ann. Sci. Nat., Bot. IV, 1: 181. 1854. *Girardinia palmata* Blume, Mus. Bot. 2: 158. 1855. *Girardinia condensata* (Hochst. ex Steud.) Wedd., Arch. Mus. Hist. Nat. 8: 169. 1856. *Girardinia furialis* Blume, Mus. Bot. 2: 159. 1856. *Girardinia vahlii* Blume, Mus. Bot. 2: 258. 1856. *Girardinia formosana* Hayata ex Yamam., Icon. Pl. Formosan. Suppl. 1: 3. 1925. *Girardinia longispica* Hand.-Mazz., Sinensia 2: 133. 1932. *Girardinia chingiana* S.S.Chien, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 9: 259. 1934. **Fig. 26.**

Local name: *Bichua*

English: *Nilghiri Nettle*

Annual or perennial, dioecious or monoecious herbs, up to 2 m tall. Stems branched or not, woody, straight, 5-angled, spreading pubescent and armed with stinging and stigose hairs. Leaves stipulate; stipules oblong-ovate, 1.2-3.0 cm long, sparsely strigose beneath; petiole 2-15 cm long, stinging and stigose hairy; leaf blades elliptic, ovate or obovate, base cordate or subtruncate, apex short acuminate or acute, margin 3-7 lobed, rarely lowermost leaves not lobed, serrate or sometimes doubly serrate at the base of the lobe, herbaceous, 3-nerved, lateral nerves 3-5 pairs, anastomosing before margin, lower surface sparsely pubescent, armed with stinging and setulose hairs, upper surface sparsely appressed strigose, armed with short stinging hairs, cystoliths minutely punctiform. Inflorescences glomerules, more than 6 cm long, densely armed with stinging hairs. Male inflorescences in proximal axils, spicate, cymose-racemose or subpaniculate, 5-10 cm long; female ones in distal axils of stem or in same axils as male, sometimes solitary, racemelike or paniculate, rarely spicate, up to 25 cm, strigose and spreading hirsute. Male flowers: pedicellate or subsessile, perianth lobes 4, ovate, concave, stamens 4, rudimentary ovary cupular. Female flowers: ca. 0.5 mm long, perianth lobes unequal, enlarged to 1 mm at fruit, sparsely hairy outside, apex 3-toothed, the smaller lobes linear. Achenes dark brownish to grey-brown, subcordate to broadly ovoid, slightly compressed, 1.5-3.0 mm in diameter, conspicuously verrucose. $2n = 20$ (Fedorov, 1969). *Fl. & fr.*: 9-11. *Forest margins, shady moist places, along streams, disturbed places; between 200-500 m altitudes.*

Bandarban: Ruma, Chakma para-Pransa para, 25 i 1965, *M.S. Khan*, K-1120 (DUSH).

Africa, Sri Lanka, Bhutan, India, Nepal, Indonesia, Malaysia, China and Korea.

Leaves are used for the treatment of headache, joints swollen and fever. Ropes and coarse clothes are made from silky fibre of the plant.

Gonostegia Turcz., Bull. Soc. Imp. Naturalistes Moscou. 19(2): 509. 1846.

Type species: Type not designated

Monoecious or dioecious, perennial herbs or subshrubs, erect or sometimes diffuse, without stinging hairs. Leaves opposite or sometimes alternate in upper stems; stipules often persistent, lateral, intrapetiolar, free; leaf blades 3(-5)-veined, margin entire; cystoliths punctiform. Inflorescences axillary, glomerules of male and female flowers or unisexual; bracts small, membranous. Male flowers subglobose, apex abruptly truncate; perianth (3 or) 4 or 5, usually free, valvate, segments angled, transversely crested or villous; stamens as many as perianth lobes; filaments inflexed in bud; rudimentary ovary present. Female flowers: perianth tubular, often ovoid, beaked, constricted, 2-4-toothed at apex; staminodes absent. Ovary included; style present; stigma filiform, villous along 1 side, deciduous with style; ovule orthotropous. Achenes enclosed by marcescent, always accrescent, usually with longitudinally winged or ribbed perianth; pericarp often crustaceous, lustrous.

KEY TO THE SPECIES

1. Leaves alternate in upper stems; female perianth tube longitudinally 2(or 3)-winged **G. pentandra**
- + Leaves all opposite; female perianth tube 10-12-winged **G. hirta**

Gonostegia hirta (Blume) Miq., Ann. Mus. Bot. Lugduno-Batavi. 4: 303. 1868. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 204. 1982. *Urtica hirta* Blume, Bijdr. Fl. Ned. Ind. 495. 1826. *Memoralis hirta* (Blume ex Hassk.) Wedd., Prodr. 16(2): 2356. 1869. *Gonostegia quinquenervis* Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 303. 1869. *Pouzolzia hirta* Blume ex Hassk., Cat. Hort. Bot. Bogor. 80. 1844. Hook.f., Fl. Brit. India 5: 586. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 724. 1903 (Indian reprint ed. 1963); Kanjilal *et al.*, Fl. Assam 4: 291. 1940 (reprint 1982). *Driessenia sinensis* H. Lév., Repert. Spec. Nov. Regni Veg. 11: 494. 1913. **Fig. 27.**

Monoecious or dioecious, prostrate herbs, sometimes subshrubs, 50-100 cm long. Stems 4-angled distally, pubescent. Leaves opposite, stipules broadly ovate, 2.3-2.6 mm long; petiole 1-4 mm long; leaf blades narrowly lanceolate, rarely narrowly ovate or elliptic, 2-10 × 0.8-3.0 cm, base subcordate or rounded, apex acuminate or acute, herbaceous or thinly papery, 3(or 5)-nerved, upper surface sparsely strigillose or

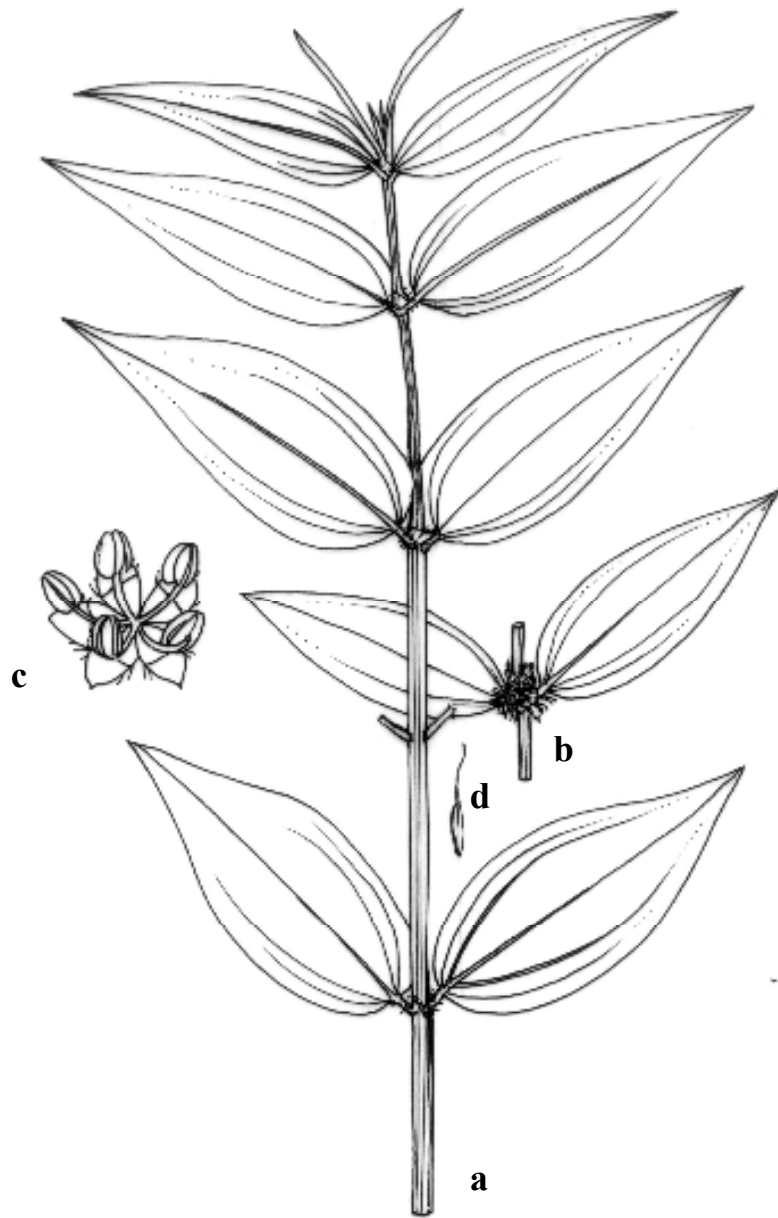


Figure 27. *Gonostegia hirta* (Blume) Miq.: a) Vegetative shoot; b) Male flowering branch; c) Male flower; d) Female flower.

subglabrous, lower surface sparsely pubescent along nerves or subglabrous. Glomerules often bisexual or sometimes unisexual, 2-8 mm in diameter. Male flowers: pedicel 1-5 mm long; buds 1.8-2.2 mm in diameter; perianth lobes 5, oblanceolate, 2.0-2.5 mm long, apex acute. Female flowers sessile; perianth tube ovoid, 1.5-1.7 mm long, longitudinally 10-winged, apex 2-toothed. Achenes ovoid, 1.3-1.5 mm diameter, white to black. $2n = 26$, 32 (Kumar & Subramaniam, 1986). *Fl. & fr.*: 5-9. *Waste places, thickets, ditches and rice fields; up to 300 m altitudes.*

Bogura: Mohasthanagar, 22 viii 1989, *M.K. Mia et al.*, M-2184 (DACB 7243). **Chattogram:** Chittagong University, 23 iii 2008, *B. Khan et al.*, B-824 (DACB 32633). **Cox's Bazar:** Kalatali, 17 v 1999, *A.M. Huq & M.K. Mia*, H-10566 (DACB 31819); **Dhaka:** Jinjira, 14 vi 1970, *A.M. Huq*, H-31 (DACB -6183); Islampur Road near Mitford, 17 ix 1978, *M.A. Hasan et al.*, H-3864 (DACB 6179); Mirpur, National Botanic Garden, 27 v 2011, *S.S. Shetu* 34 (JUH). **Kushtia:** Munshigonj, Alamdanga, 10 vi 1974, *M.S. Khan and A.M. Huq*, K-3896 (DACB 6201). **Sylhet:** Bhanugach to Adampur, 17 viii 1976, *M.S. Khan et al.*, K-4380 (DACB 6194).

Asia and Australia.

The plant is used as fodder for pigs. It is also used medicinally for the treatment of boils and bone fractures.

Gonostegia pentandra (Roxb.) Miq., *Ann. Mus. Bot. Lugduno-Batavi*. 4: 302. 1868. Hara *et al.*, *Enu. Fl. Pl. Nepal* 3: 204. 1982. *Urtica pentandra* Roxb., *Fl. Ind.*, ed. 1832, 3: 583. 1832. *Pouzolzia pentandra* (Roxb.) Bennett, *Pl. Jav. Rar.* 64. 1838; Hook.f., *Fl. Brit. India* 5: 583. 1888 (Indian repr. 1954); Prain, *Beng. Pl.* 2: 724. 1903 (Indian reprint ed. 1963). *Gonostegia alternifolia* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 19(2): 510. 1846. *Gonostegia oppositifolia* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 19(2): 510. 1846. *Hyrtanandra pentandra* (Roxb.) Miq., *Pl. Jungh.* 25. 1851. *Hyrtanandr pentandra* (Roxb.) Miq., *Pl. Jungh.* 25. 1851. *Boehmeria melastomoidea* Griff., *Not. Pl. Asiat.* 4: 386. 1854. *Pouzolzia hypericifolia* Blume, *Mus. Bot.* 2: 242. 1857. *Gonostegia aquatica* Miq., *Ann. Mus. Bot. Lugduno-Batavi* 4: 303. 1869. *Memoralis pentandra* (Roxb.) Wedd., *Prodr.* 16(1): 235(2). 1869. *Gonostegia pentandra* var. *akoensis* (Yamam.) Masamune, *J. Soc. Trop. Agric.* 3: 392. 1931. *Gonostegia pentandra* var. *hypericifolia* (Blume) Masamune, *J. Soc. Trop. Agric.* 3: 114. 1931. **Fig. 28.**



Figure 28. *Gonostegia pentandra* (Roxb.) Miq.: a) Flowering shoot.

Prostrate or ascending herbs, often pendent at apex, or subshrubs upto 50 cm tall, monoecious. Stems 4-angled, strigillose on ridges. Leaves opposite in lower stems, alternate in upper ones, becoming smaller and denser, stipules broadly ovate, ca. 1 mm wide; subsessile; leaf blades linear-lanceolate or oblong-elliptic (in lower stem), lanceolate or narrowly ovate (in upper stem), 0.5-5.0 × 0.5-1.5 cm, thinly papery; trinerved, base rounded or subcordate, apex acuminate or acute. Glomerules bisexual, in upper stems. Male flowers: pedicel 2.0-3.5 mm long; buds 2 mm in diameter; perianth lobes (4 or) 5. Female flowers: sessile, perianth tube ellipsoid, 1.8-2.2 mm long, longitudinally 2(or 3)-winged, apex indistinctly 2(or 3)-toothed. Achenes black, ovoid, 1.4-1.6 mm diameter. *Fl. & fr.*: 4-8. *Grasslands, moist places; up to an altitudes of 300 m.*

Bagerhat: Sundarban, Sarankhola, 15 iv 2010, *Sayedur Rahman*, S-566 (DACB 38475).

Pakistan, India, Myanmar, Thailand, Vietnam, China, Philippines, Indonesia to Papua New Guinea.

Laportea Gaudich. in Freyc., *Voy. Bot.*: 498. 1826.

Type species: *Laportea canadensis* (L.) Wedd.

Monoecious or dioecious herbs or shrubs with stinging hairs. Leaves simple, alternate, petiolate; stipules deciduous, intrapetiolar, partially connate, apex 2-cleft; leaf blades papery, pinnately veined or 3-veined, margin often coarsely dentate or serrate, rarely entire; cystoliths punctiform. Inflorescences axillary, solitary, loose glomerules forming panicles or sometimes racemes or spikes, pedunculate, unisexual; bracts very small. Flowers in loose glomerules, pedicels winged. Male flowers: perianth lobes 4 or 5, free, subvalvate, depressed, inflexed in bud; stamens 4 or 5, filaments reflexed; rudimentary ovary clavate or subglobose. Female flowers: perianth lobes 4, free or connate, strongly unequal, dorsal-ventral 2 greatly unequal and smaller, lateral 2 equal and larger; staminodes absent; ovary superior, straight to oblique-ovoid; styles filiform, rarely brush-like; stigma often linear, at length often reflexed, papillose on one side; ovule orthotropous. Fruit an achene, compressed, ovoid to hemispherical, up to 4 mm long, sessile or stipitate, usually reflexed. Seeds with thin or no endosperm, cotyledons broad.

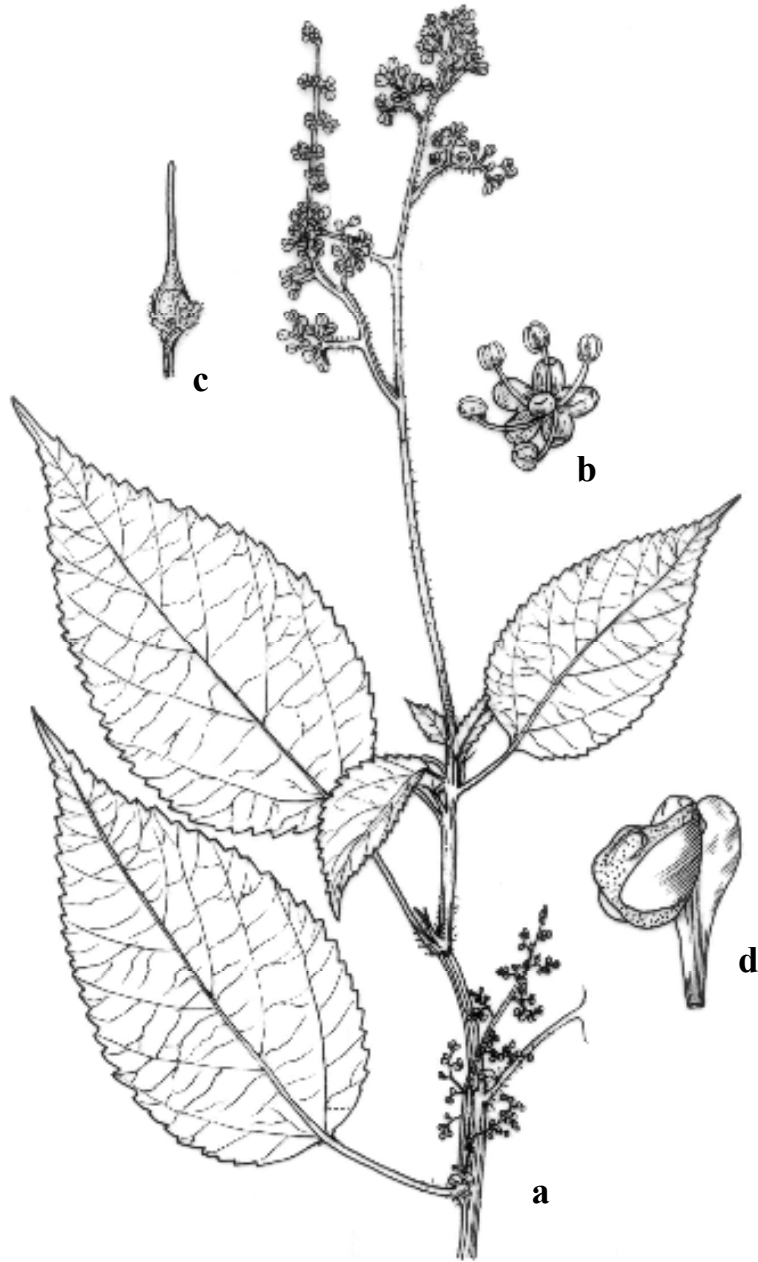


Figure 29. *Laportea bulbifera* (Siebold & Zucc.) Wedd.: a) Flowering shoot; b) Male flower; c) Female flower; d) Achene.

KEY TO THE SPECIES

1. Leaf axils often with woody bulbils; pedicels of female flowers conspicuously laterally and symmetrically winged; achene articulated on pedicel

L. bulbifera

- + Leaf axils often without woody bulbils; pedicels of female flowers slightly and asymmetrically winged or not winged; achene not articulated on pedicel

L. interrupta

Laportea bulbifera (Siebold & Zucc.) Wedd., Arch. Mus. Hist. Nat. 9(1-2): 139. 1856-1857. Uddin *et al.*, Bull. Bangladesh National Herb. 4: 13. 2015. *Urtica bulbifera* Siebold & Zucc., Abh. Bayer. Akad. Wiss., Math.-Naturwiss. Abt. 4 (3): 214. 1846. *Laportea terminalis* Wight, Icon. Pl. Ind. Orient. 6: 9, pl. 1972, 9. 1853. Kanjilal *et al.*, Fl. Assam 4: 282. 1940 (reprint 1982); Cowan & Cowan, Tree North Beng.: 128. 1929; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 204. 1982. *Laportea oleracea* Wedd., Arch. Mus. Hist. Nat. 141. 1856. *Laportea evitata* Wedd., Prodr. [A. P. de Candolle] 16 (1): 79. 1869. *Urticastrum evitatum* (Wedd.) Kuntze, Revis. Gen. Pl. 2: 635. 1891. *Laportea sinensis* C.H. Wright, J. Linn. Soc., Bot. 26 (178): 474-475. 1899. *Laportea dielsii* Pamp., Nuovo Giorn. Bot. Ital., n.s., 17(2): 255-256. 1910. *Laportea dielsii* Pamp., Nuov. Giorn. Bot. Ital. 17: 255. 1910. *Laportea dielsii* Pamp., Nuovo Giorn. Bot. Ital., n.s., 17(2): 255-256. 1910. *Boehmeria bodinieri* H. Lév. in Fedde, Repert. 11: 550. 1913. *Laportea elevata* C.J. Chen, Acta Bot. Yunnanica, 4 (4): 330. 1982. *Laportea bulbifera* subsp. *latiuscula* C.J. Chen, Acta Bot. Yunnanica, 4 (4): 329. 1982. *Laportea bulbifera* subsp. *rugosa* C.J. Chen, Acta Bot. Yunnanica, 4 (4): 330. 1982. **Fig. 29.**

Monoecious herbs, rarely dioecious. Stems often caespitose, slightly woody at base, 50-150 cm tall, upper stems often zigzag, 5-angled, rarely branched, 1-3 woody bulbils in axils, 3-6 mm in diameter; upper stems and petioles pubescent, armed with stinging hairs, particularly at nodes, glabrescent. Leaves crowded at stem apex or not; stipules caducous, oblong-lanceolate, 5-10 mm, apex 2-cleft up to half of length; petiole 1.5-10 cm long; leaf blades lanceolate to ovate or cordate, sometimes orbicular, 6-16 × 3-8 cm, base broadly cuneate, rounded, rarely shallowly cordate, margin crenate, dentate or serrate, apex acuminate, light green abaxially, papery, 3-nerved, lateral nerves 4-6 pairs, lower surface pubescent, veins sparsely armed with stinging hairs, particularly at base, upper

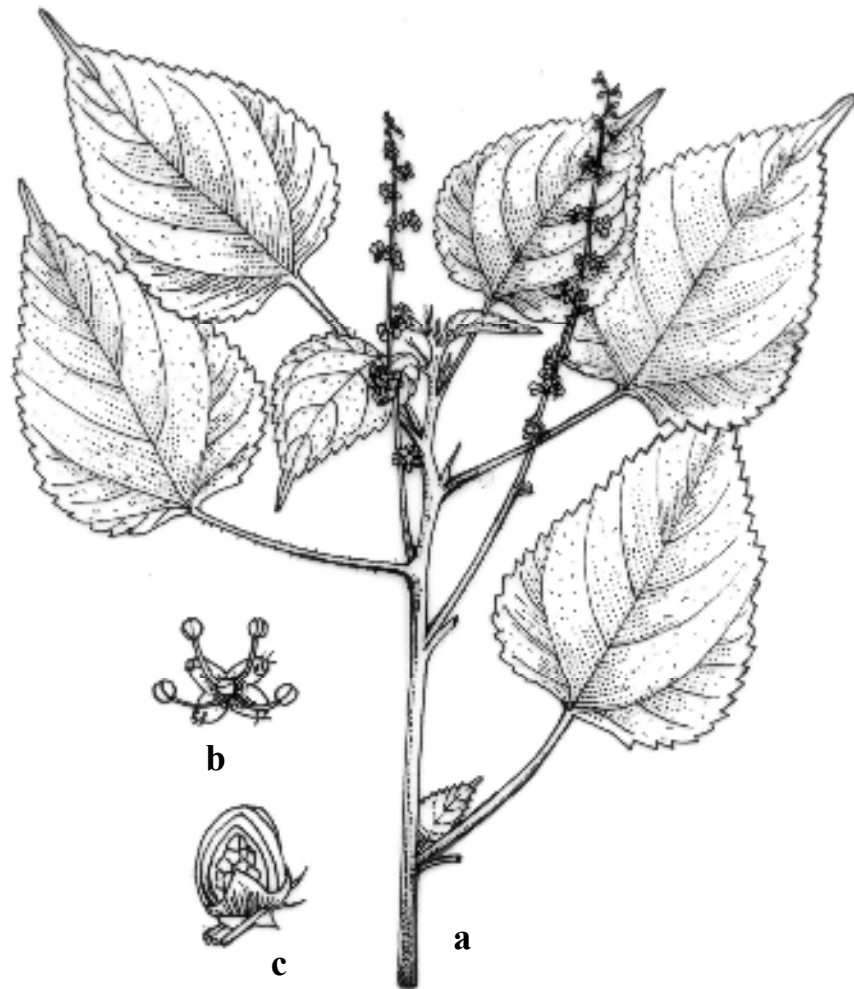


Figure 30. *Laportea interrupta* (L.) Chew: a) Flowering shoot; b) Male flower; c) Achene with persistent perianth.

surface appressed hirsute with stinging hairs, cystoliths minutely punctiform, adaxially conspicuous. Male inflorescences paniculate in proximal axils, 3-10 cm long; female inflorescences terminal or subterminal axils, 10-25 cm long, peduncle 3-10 cm long, often with flowers along one side. Male flowers: pedicellate or subsessile, bud ca. 1 mm; perianth lobes 5, oblong-ovate, puberulent; stamens 5; rudimentary ovary obpyramidal, 0.5 mm long. Female flowers: pedicel 2-4 mm long, strongly laterally winged; perianth lobes 4, almost free, strongly unequal, dorsal lobe concave, ca. 0.5 mm long, 2 lateral larger, enclosing the ovary, oblong-ovate, shorter or equal to achene, abaxially setulose with stinging hairs, ventral lobe smallest, triangular-ovate, ca. 0.3 mm long. Ovary stipitate, asymmetrically ovoid; stigma reflexed, filiform, 2-4 mm long. Achenes minutely purplish spotted, broadly obovoid or semiorbicular, strongly compressed, 1.5-3.0 mm in diameter, smooth, rarely rugose-striate; fruiting pedicel winged, spatulate to obovate, stipe ca. 0.5 mm long, strongly reflexed; persistent lateral perianth lobes slightly enlarged, ca. 1.5 mm long. $2n = 60$ (Fedorov, 1969). *Fl. & fr.*: 6-12. *Forest margins, thickets, roadsides, often partly shady, moist places.*

East Bengal: Locality and date unknown, Griffith, 4571 (CAL 432031).

Bhutan, India, Indonesia, Japan, Korea, Myanmar, Russia, Sikkim, Sri Lanka, Thailand, Vietnam.

Laportea interrupta (L.) Chew, Gard. Bull. Singapore 21(2): 200-201. 1965. Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 421. 2009. *Urtica interrupta* L., Sp. Pl. 2: 985. 1753. *Fleurya interrupta* (L.) Gaudich., Voy. Uranie 497. 1830; Hook.f., Fl. Brit. India 5: 548. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 721. 1903 (Indian reprint ed. 1963); Kanjilal *et al.*, Fl. Assam 4: 280. 1940 (reprint 1982). *Schychowskia interrupta* (L.) Wight, Contri. U.S. Nation. Herb. 9: 371. 1905. **Fig. 30.**

Local name: *Lal bichuti*

Annual, monoecious herbs, up to 1.5 m tall. Stems straight, branched, woody at the base, branchlets furrowed, armed with short stinging hairs. Leaves simple, alternate; stipules ovate-oblong, ca. 4 mm long, setulose along rib abaxially, apex bi-cleft half of length; petioles 5-8 cm long; leaf blade ovate or elliptic-ovate, 5-12 × (3-) 5-7 (10) cm, base obtuse, rounded to subcordate, apex acuminate, margin coarsely serrate, upper herbaceous, 3-nerved, lateral basal pair reaching middle margin, lateral nerves 5 or 6

pairs, reaching teeth, both surfaces sparsely armed with stinging hairs, cystoliths botuliform, regularly arranged abaxially along nerves. Inflorescences axillary, spicate, to 25 cm long, lateral branches reduced to glomerules, armed with stinging hairs. Male flowers: in bud ca. 1.2 mm long, pedicels ca. 1 mm long, perianth lobes 3 or 4, connate half of the length, obovate, 1.0-1.5 × 1.0-1.5 mm, with irritant hairs, stamens 3 or 4, filaments c 2 mm long, reflexed; rudimentary ovary obpyramidal, 0.5 mm long. Female flowers: pedicels 0.5-1.5 mm long, perianth lobes 4, free, unequal, dorsal lobe ovate, concave, ca. 0.4 mm long, lateral ones largest, enclosing the ovary, broadly ovate, ca. 0.4 mm long, ventral lobe smallest, triangular ovate, ca. 0.3 mm long, ovary obliquely triangular, ca 1 mm long; stigmas ca. 0.3 mm long, filiform, 3-fid, reflexed. Achenes asymmetrically triangular, compressed, ca. 1.3 diameter, with triangular ridge enclosing a warty depression, persistent lateral perianth lobes forming a small basal cup. Seeds nearly exalbuminous. $2n = 26$ (Kumar and Subramaniam, 1986). *Fl. & fr.*: 8-11. *Disturbed places of dense forests, along streams; between 400-800 m altitudes.*

Barishal: Kashipur, 21 v 1979, *Shah Alam*, Sh-202 (DACB 6146). **Chattogram:** Chattogram, 30 ix 1940, *S.K. Sen et al.*, ? (DUSH); Mastannagar station, 8 x 1970, *A.M. Huq*, H-243 (DACB 6140); BFRI Campus, Sholoshahar, 10 viii 2005, *Syedul and Rahman*, 9962 (BFRI). **Kushtia:** Alamdanga, Kalidaspur, G.K Canal, 11vi 1974, *M.S. Khan and A.M. Huq*, K-3917 (DACB 6141). **Dhaka:** Central Road, 13 viii 1973, *A.M. Huq*, H-1048 (DACB 6137); Armanitala, Beeharumdeuri, 17 ix 1978, *M.A. Hasan et al.*, H-3860 (DACB 6150); Mirpur, Diabari (near Beribandh), 25 i 2013, *S.S. Shetu* 573 (JUH); Mirpur, National Herbarium campus, 28 x 2013, *E.H. Khokon*, EHK-13 (DACB 39055); Sadarghat, 9 vi 1968, *R. Roy*, 129 (DUSH). **Faridpur:** Goalandoghat, 1 vii 1973, *A.M. Huq*, H-983 (DACB 6139). **Jashore:** Keshabpur, Bhadhurey, 30 viii 1983, *A.M. Huq et al.*, H-6030 (DACB 6144); Kaligonj, Malikpur, 31 viii 1983, *A.M. Huq et al.*, H-6091 (DACB 6136); Jhikorgacha, Mallikpur, 2 ix 1983, *A.M. Huq et al.*, H-6141 (DACB 6135). **Gazipur:** Pubail, 3 i 1969, *Md. Azizur Rahman*, 11 (DUSH); C & B. Nursery, 18 vii 1969, *Panna*, 163 (DUSH). **Magura:** Magura, 5 xi 1990, *Ananya Haque*, 19 (DUSH). **Manikgonj:** Manikgonj, 25 xi 1973, *M.S. Khan and A.M. Huq*, K-3395 (DACB 6138); Manikgonj, 12 xi 1975, *A.M. Huq et al.*, H-1479 (DACB 6153). **Mymensingh:** Mymensingh Police Line, 18 ix 1980, *M.K. Mia et al.*, M-360 (DACB 6147); Susang, Durgapur, Farongpara, 3 xi 1983, *A.M. Huq et al.*, H-6423 (DACB 6145). **Narayanganj:** Sonargaon, 3 x 1977, *A.M. Huq & M. Rahman*, H-3496 (DACB 6151). **Rajshahi:** Rajshahi Town, 27 x 1989, *M.K. Mia et al.*, M-2462 (DACB 31199); Durgapur, Noapara

union, Angareer beel, 18 ix 1996, *M.S. Khan & H. Rashid*, K-9556 (DACB 39163).
Rangpur: Saidpur officer's colony, 15 x 1976, *A.M. Huq et al.*, H-2603 (DACB 6142).
Sylhet: Jaintapur Forest Area, 01 x 1983, *A.M. Huq et al.*, H-6243 (DACB 6154);
 Sagardighirpar, 22 x 1986, *A. M. Huq & M.K. Mia*, H-7978 (DACB 6152). **Tangail:**
 Madhupur, 5 viii 1976, *M.S. Khan et al.*, K-4172 (DACB 6143); Nandabala, 30 x 1979,
Anisur Rahman (DACB 6148).

Africa, Sri Lanka, India, Myanmar, Thailand, China, Vietnam, Indonesia, Japan, Malaysia and the Philippines.

The plant is used in the treatment of alopecia by intensifying the capillary blood flow, and keeping the scalp and the hair follicles active. Leaves are applied to carbuncles. The decoction of the root is diuretic and prescribed as a remedy for cough and asthma. Flowers are externally applied to sores on the sole.

Neodistemon Babu & Henry, *Taxon* 19: 651. 1970.

Type species: *Neodistemon indicum* (Wedd.) Babu & Henry.

Slender erect annual herbs. Leaves alternate, petioled, coarsely toothed, 3-nerved and penninerved. Flowers monoecious, in small bracteate 3-fid, androgynous clusters which form slender axillary and long terminal spikes. Male flower, Perianth campanulate, 2-3 fid, valvate. Stamens tricose. Ovary included and more or less adnate to the perianth; stigma linear, deciduous; ovule erect. Achenes broadly ovoid, acuminate included in the thickened fleshy or thin crustaceous perianth; pericarp fragile. Albumen copious, cotyledons broad.

Neodistemon indicum (Wedd.) Babu & Henry, *Taxon* 19: 651. 1970. Uddin *et al.*, *Bull. Bangladesh National Herb.* 4: 14. 2015. *Urtica grossa* Wall., *Numer. List* 4615. 1831. *Distemon indicum* Wedd., *Monogr. Fam. Urtic.* 551. 1856. Hook.f., *Fl. Brit. India* 5: 588. 1888 (Indian repr. 1954); Kanjilal *et al.*, *Fl. Assam* 4: 292. 1940 (reprint 1982). *Australina diandra* Wedd., *Arch. Mus. Hist. Nat.* 9: 551. 1856. **Fig. 31.**

Perennial, slender herbs, erect, 30-60 cm tall, scarcely branched, puberulous or sparsely hairy. Leaves alternate, unlobbed, leaf blades ovate, or elliptic-ovate, 5-8 × 4-5 cm, margins coarsely dentate, base shortly cuneate, apex acute to acuminate, 3 nerved at



Figure 31. *Neodistemon indicum* (Wedd.) Babu & Henry: a) Flowering shoot.

base, beneath hairy on nerves, thinly cobwebby between, uppersurface hairy; petiole slender, 2.5-5 cm long; stipules lateral, free, lanceolate with a long setaceous apex, ca. 1 cm long. Inflorescences terminal or axillary, slender leafless unbranched spike-like axes, erect, 3-12 cm long; bracts sub-amplexicaul, ovate, cordate with cuspidate tip. Small monoecious flowers, yellowish, clusters of 3 flowers, arranged along same axils, ca. 1 mm long. Male flowers: 2-merous; calyx sub-infundibuliform, bipartite; segments equal entire shortly acuminate; stamens 2-3, exserted; rudimentary ovary linear lanate. Female flowers: often 2-nately concrete; calyx tubular-ventricose, limb very small, ovoid, denticulate, 2-toothed, closely investing the compressed oblong-lanceolate ovary; ovules suberect, funicle very short, style linear, articulate at base, soon deciduous, sometimes stigmatose-papillose from base to apex. Achenes 2.5 mm long, broadly ovoid, beaked, included in thickened perianth, pericarp fragile. Seeds erect, cotyledons of albuminous embryo quadrate-rotundate, longer than conical radicle. *Fl. & fr.*: 8-9. *Grows in rocky places under shade; up to 1000 m altitudes.*

East Bengal: Locality and date unknown, *Griffith*, 4581 (CAL 434894). **Moulvibazar:** Barolekha, Madhabkunddo, 23 ix 2011, *S.N. Uddin*, N-4843, (DACB 41798); Madhabkundo Eco-park, 21 ix 2014, *S.N. Uddin*, N-5558 (DACB). **Rangamati:** Rampahar, Kaptai, 30 ix 2002, *S.N. Uddin*, N-1646 (DACB).

India, Burma and Indonesia.

Oreocnide Miq., Pl. Jungh. 1: 39. 1851.

Type species: Type not designated

Dioecious shrubs or small trees, without stinging hairs. Leaves simple, alternate, petiolate; stipules intrapetiolar, connate, bifid at the apex; leaf blades pinnately veined or 3-veined, margin serrate, denticulate or entire, cystoliths punctiform. Inflorescences axillary, small, pedunculate, densely capitate clusters of unisexual flowers; solitary glomerules or pairs of dichotomously branched cymes; bracts small. Male flowers: perianth 3 or 4 lobed, lobes ovate, acute, valvate, stamens 3 or 4, filaments inflexed in bud; rudimentary ovary obovate-clavate, woolly. Female flowers: perianth tubular, adnate to the ovary, mouth contracted, apex 3- or 4-toothed; staminodes absent; stigma sessile, discoid or peltate, long ciliate hairs along margin; ovule orthotropous. Achenes

drupaceous, straight, adnate to thinly fleshy perianth, enclosed by discoid or cuplike fleshy receptacle. Seeds with endosperm; cotyledons ovate or broad.

Oreocnide integrifolia (Gaudich.) Miq., Ann. Mus. Bot. Lugduno-Batavi. 4: 306. 1869. Kanjilal *et al.*, Fl. Assam 4: 293. 1940 (reprint 1982); Alam, Pl. Taxon. Series, Bull. 5: 114. 1988; Hara *et al.*, Enu. Fl. Pl. Nepal 3: 205. 1982; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 422. 2009. *Villebrunea integrifolia* Gaudich., Voy. Bonite, Bot., Atlas, t. 91. 1844. Hook.f., Fl. Brit. India 5: 589. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 725. 1903 (Indian reprint ed. 1963); Brandis, Indian Trees 618. 1906; Heinig, List Chittagong: 67. 1925. *Villebrunea appendiculata* Wedd., Prodr. 16(1): 235(20). 1869. *Oreocnide acuminata* (Roxb.) Kurz, Forest Fl. Burma 2: 427. 1877. *Villebrunea sylvatica* Blume var. *integrifolia* Wedd., Prodr. 16(1): 235, f. 21. 1869. **Fig. 32.**

Local names: *Ban-katkora, Ban-rhea, Horhuta*

Evergreen, dioecious trees or shrubs, 5-15 m tall. Bark grayish brown or brown gray; branchlets grayish brown pubescent. Leaves alternate, simple, entire; stipules linear, 1-2 cm long; petiole 1-8 cm long; leaf blades elliptic, oblong, oblong-lanceolate or oblanceolate, 10-30 × 3-10 cm, base rounded or obtuse, apex caudate to long caudate-acuminate, margin denticulate to middle, entire apically, papery, 3-nerved, basal pair reaching middle margin, secondary nerves 10-12 pairs, reticulate, abaxial surface densely villous or sparsely pubescent on veins or sometimes tomentose, adaxial surface glabrous, becoming grayish green when dry. Inflorescences in axils of fallen leaves or on older branches, dichotomously branched 2 or 3 times, 1.5-2.5 cm long; glomerules 4-5 mm in diameter. Male flowers: perianth lobes 4, oblong, connate half of length, ca. 1.2 mm long, rudimentary ovary subclavate. Female flowers ca. 1 mm long. Achenes conical, ca 1.5 mm long, 3 or 4 ribbed, surrounded by a fleshy discoid cupule at the base. *Fl. & fr.*: 3-9. *Evergreen forests, valleys, along streams; up to 600 m altitudes.*

Bandarban: Balaghata, Bandarban sadar, 9 viii 1989, *M.K. Alam*, 4650 (BFRI). **Chattogram:** Hazarikhil, Baraiyadhala, 14 v 1964, *M.S. Khan*, K-858 (DUSH); R.S. Forest Range, Hazarikhil, 14 iii 1964, *M.S. Khan*, K-838 (DUSH); Manikchari, 25 iv 1976, *A.M. Huq and M.K. Mia*, H-2370 (DACB 6246); South-West of Hazarikhil, 1 xi 1978, *A.M. Huq et al.*, H-4125 (DACB 6247); Chunati Sanctuary, Napora, 30 xii 1989,



Figure 32. *Oreocnide integrifolia* (Gaudich.) Miq.: a) Fruiting shoot.

M.S. Khan et al., K-8187 (DACB 6242); Dhopachari, Chamachari, 7 x 1998, *M.A. Rahman et al.* 3522 (DACB 29052); Chunati, Goalmara, 9 vi 2001, *S.N. Uddin* N-940 (DACB 34067); Hazarikhil Wildlife Sanctuary, Kalapani, 19 viii 2014, *S.N. Uddin*, N-5443 (DACB 42377). **Cox's Bazar:** Whykeong, Horikhola, Kudumgath, 1 xi 2008, *S.N. Uddin*, N-3133 (DACB 33485). **Habiganj:** Habigonj 2 Range, Kalenga beat, 14 iv 2008, *M.S. Khan et al.*, (DACB 30,666). **Moulvibazar:** Lawachara, 10 iv 2007, *B. Khan et al.*, B-248 (DACB 34,320); Srimongol, Lawachara, 4 ii 2009, *S.N. Uddin*, N-3406, (DACB 43651); Lawachara National Park, 8 iii 2011, *S.N. Uddin*, N-4453 (DACB 35807); Kamalgonj, Kamarchara forest beat, 21 ix 2011, *S.N. Uddin*, N-4798 (DACB 37363); Kamalgonj, Adampur, 19 v 2014, *Bushra et al.*, B-3087 (DACB 40935); Madhabkundo, Patharia, 28 iii 1981, *M.S. Khan et al.*, K-6261 (DACB 6245); Lawachara, Kamalchhari, 3 ii 2009, *B. Khan, et al.*, B-1363 (DACB 34,437). **Rangamati:** Gilachari, Rangamati sadar, 25 ii 1986, *M.K. Alam*, 5561 (BFRI); Kaptai, Rampahar, 1 x 2002, *S.N. Uddin*, N-1736 (DACB 33683); Kaptai, Rampahar, Bilaichari, 28 v 2003, *S.N. Uddin*, N-1868; Pharua reserve forest, Pharua chara, 19 iv 2009, *B. Khan et al.*, B-1478 (DACB 34,904); Pharua Reserve Forest, Bilaichari, 15 x 2009, *S.N. Uddin*, N-3079 (DACB 33283). **Sylhet:** Sonarupa Tea Estate area, 1 ii 1979, *A.M. Huq*, H-4199 (DACB 6243); Lathitilla, 29 xi 1983, *M.K. Alam*, 4728 (BFRI).

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

Ropes, nets, fishing lines and sack-cloth are made from the bast fibre of the plant.

Pellionia Gaudich., *Voy. Uranie*, Bot. 494. 1830.

Type species: *Pellionia elatostemoides* Gaudich.-Beaupré

Monoecious or dioecious herbs or subshrubs, without stinging hairs. Leaves apparently alternate, distichous; nanophylls present or absent, opposite to normal leaves; stipules 2; leaf blade 3-nerved, one major lateral vein sometimes inserted above the base, or pinnately veined, base asymmetric, margin entire or serrate; cystoliths mostly present, linear or fusiform. Inflorescences axillary, cymes of unisexual flowers; male ones usually pedunculate; female ones pedunculate or sessile, bracteose, rarely with discoid receptacle and involucre. Male flowers: perianth lobes 4 or 5, elliptic, connate half of length, slightly valvate, apex usually corniculate; stamens as many as and opposite to perianth lobes; filaments inflexed in bud; rudimentary pistil small. Female flowers: perianth lobes

4 or 5, distinct, longer than or as long as ovary, usually unequal, apex usually corniculate; staminodes as many as and opposite to perianth, scale-like. Ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes ovoid or ellipsoid, slightly flattened, usually tuberculate.

KEY TO THE SPECIES

- | | | |
|----|--|----------------------|
| 1. | Margins of leaf blade entire | P. heyneana |
| + | Margins of leaf blade denticulate, crenate, serrate or nearly undulate | 2 |
| 2. | Plants with nanophylls | P. repens |
| + | Plants without nanophyll | P. heteroloba |

Pellionia heteroloba Wedd., Arch. Mus. Hist. Nat. 9(1-2): 283, pl. 9, f. 15. 1856. Hook.f., Fl. Brit. India 5: 559. 1888 (Indian repr. 1954); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 16. 2015. *Pellionia griffithiana* Wedd., Prodr. 16 (1): 165. 1869. Hook.f., Fl. Brit. India 5: 559. 1888 (Indian repr. 1954). *Elatostema griffithianum* (Wedd.) Hallier f., Ann. Jard. Bot. Buitenzorg 13: 316. 1896. *Pellionia keitaoensis* Yamam., Icon. Pl. Formosan., Suppl. 1: 15-17, pl. 1, 1925. *Elatostema henryanum* Hand.-Mazz., Symb. Sin. 7: 144. 1929. *Pellionia heteroloba* var. *minor* W.T. Wang, Bull. Bot. Lab. Forest. Inst., Harbin 6: 60. 1980. *Pellionia menglianensis* Y.Y. Qian, Acta Phytotax. Sin. 37 (5): 523-525, pl. 1, 1999. **Fig. 33.**

Perennial, dioecious herbs, without stinging hairs. Stems erect or ascending, usually simple, glabrous or pubescent. Leaves alternate, distichous; stipules 2, subulate, 2-8 × 0.1-0.3 mm; petiole 3-8 mm; leaf blades herbaceous or papery, obliquely oblong, obliquely lanceolate, or oblanceolate, (4-) 8-15 × (1.5-) 2.5-5.7 cm, 3-veined, major lateral veins asymmetric to almost absent, base asymmetric, broader outer half auriculate, margin crenate or serrate, apex cuspidate, acuminate; cystoliths obscure or conspicuous; nanophyll absent. Inflorescences axillary, cymes of unisexual flowers; male inflorescences 1.0-4.5 cm in diameter, peduncle 1-9 cm long; female inflorescences 5-9 mm in diameter, peduncle 1-15 mm long; bracteose, rarely with discoid receptacle and involucre. Male flowers: tepals 5, elliptic, connate half of length, slightly valvate, apex usually corniculate; stamens 5, opposite to perianth lobes, filaments inflexed in bud; rudimentary pistil obscure. Pistillate flowers: perianth lobes 4-5, distinct, longer than or same as ovary, usually unequal, apex usually corniculate; staminodes 4-5, opposite to



Figure 33. *Pellionia heteroloba* Wedd.: a) Flowering shoot; b) Male flower.

perianth, scale-like; ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes narrowly ellipsoid, slightly flattened, tuberculate. *Fl. & fr.*: 10-2. *Hilly forests, shady and wet rocks, along streams; between 600-1000 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4544 (CAL0000014571 & K000741062).

Bhutan, India, Myanmar, Laos, Vietnam and China.

Pellionia heyneana Wedd., Arch. Mus. Hist. Nat. 9(1-2): 287, 332, pl. 5. 1855. Hook.f., Fl. Brit. India 5: 561. 1888 (Indian repr. 1954); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 17. 2015. *Elatostema heyneanum* (Wedd.) Hallier f., Ann. Jard. Bot. Buitenzorg 13: 316 1896. **Fig. 34.**

Perennial herbs or undershrubs, monoecious or dioecious. Stems woody, ascending or erect, branched or simple, strigose. Leaves alternate or subopposite, with one of the pair smaller, falcate; blades obliquely elliptic, elliptic-ovate, or obovate, 5-15 × 2-7 cm, papery, glabrous or nerve beneath pilose, base 3-nerved, major lateral veins symmetric, narrowed and unequally cordate, margins entire, apex acuminate or caudate; cystoliths slightly conspicuous, dense; nanophylls opposite to normal leaves, narrowly ovate, 3-4 mm long; stipules 2, narrow ensiform, aristate, ca. 1.2 cm long; petiole 0.5-2.0 cm. Inflorescences axillary cymes of unisexual flowers; male inflorescences usually pedunculate, 1.5-3.5 cm in diameter, female ones pedunculate or sessile, 6-8 mm in diameter. Male flowers: tepals 5, elliptic, connate half of length, slightly valvate, apex usually corniculate; stamens 5, opposite to perianth lobes, filaments inflexed in bud; rudimentary pistil subulate. Female flowers: tepals 5, as long as ovary, usually unequal, apex usually corniculate; staminodes as many as and opposite to perianth, scale-like; ovary straight, ellipsoid, style absent, stigma penicillate, ovule orthotropous. Achenes ovoid or narrowly ovoid, slightly flattened, tuberculate. *Fl. & fr.*: 5-8. *Evergreen hilly forests, along streams and other damp places; between 400-600 m altitudes.*

Dhaka: Government Nursery, 4 ix 1940, *A.K. Acharjee*, (DUSH); 25 viii 1940, *Atul*, (DUSH). **Rangamati:** Pharua chara, Pharua Reserved Forest, Bilaichari, 19 iv 2009, *S.N. Uddin*, N-3536 (DACB 41786); 19 iv 2009, *B. Khan*, B-1488 (DACB 34884).

India, Sri Lanka, Thailand, Cambodia, Indonesia and China.



Figure 34. *Pellionia heyneana* Wedd.: a) Flowering shoot; b) Achene.

Pellionia repens (Lour.) Merr., Lingnan Sci. J. 6 (4): 326. 1928. Uddin *et al.*, Bull. Bangladesh National Herb. 4: 18. 2015. *Polychroa repens* Lour., Fl. Cochinch. 2: 559. 1790. *Procris gibbosa* Wall., Cat. n. 7273. 1832. *Elatostema gibbosum* Kurz, J. Asiat. Soc. Beng. 42(2): 104. 1873. *Pellionia daveauana* N.E.Br., Gard. Chron. 2: 262. 1880. *Pellionia pulchra* N.E.Br., Gard. Chron. 2: 712. 1882. *Elatostema pulchrum* Hallier f., Ann. Jard. Buitens. 13: 316. 1896. *Pellionia annamica* Gagnep., Bull. Soc. Bot. France, 1928, 75: 918. 1929. *Elatostema repens* (Lour.) Hallier f., Fedde, Repert. Beih. 83 (2): 25. 1936. **Fig. 35.**

English name: Weavy Watermelon Begonia

Perennial herbs, monoecious or dioecious, attains up to 10 cm tall but spreads to 60 cm long. Stems prostrate, branch terete, pubescent or glabrescent, fleshy, greenish-pink. Leaves alternate; leaf blades obliquely elliptic or obovate, 2-8 × 1-3 cm, papery, variable gray-green, with dark green along the edges and variably sized light green to silver patches in the middle, major lateral veins asymmetric, one basal, the other arising above base, broader outer half auriculate, margins undulate, undulate-crenate or nearly entire, apex obtuse, rounded; cystoliths conspicuous, dense; nanophylls ovate or nearly linear, ca. 1 mm long; stipules triangular, 4-10 × 2-5 mm long; petiole 1.5-5.0 mm long. Inflorescences axillary, cymes of unisexual flowers, male inflorescences 0.6-3.0 cm in diameter, peduncle 2-12 cm long, female inflorescences ca. 3 mm in diameter, sessile. Flowers small, greenish, inconspicuous. Male flowers: tepals 5, broadly elliptic or elliptic, slightly valvate, connate in lower half, apex usually corniculate; stamens 5, opposite to perianth lobes, filaments inflexed in bud; rudimentary pistil subulate. Female flowers: tepals 5, usually unequal, apex usually corniculate; staminodes as many as and opposite to perianth, scale-like, ovary straight, ellipsoid; style absent; stigma penicillate; ovule orthotropous. Achenes ovoid or ellipsoid, slightly flattened, tuberculate. 2n = 26 (Kumar & Subramaniam, 1986). *Fl. & fr.:* 5-10. *Valley forests, shady and damp places on rocks; between 800-1000 m altitudes.*

Dhaka: Baldha Garden, 15 i 1975, *M.K. Alam and Nasrin*, 213 (DACB); BNH office campus, 9 ii 1987, *Mahbuba Halim*, (DACB 6177).

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

It has ornamental value and hence cultivated as a pot plant.

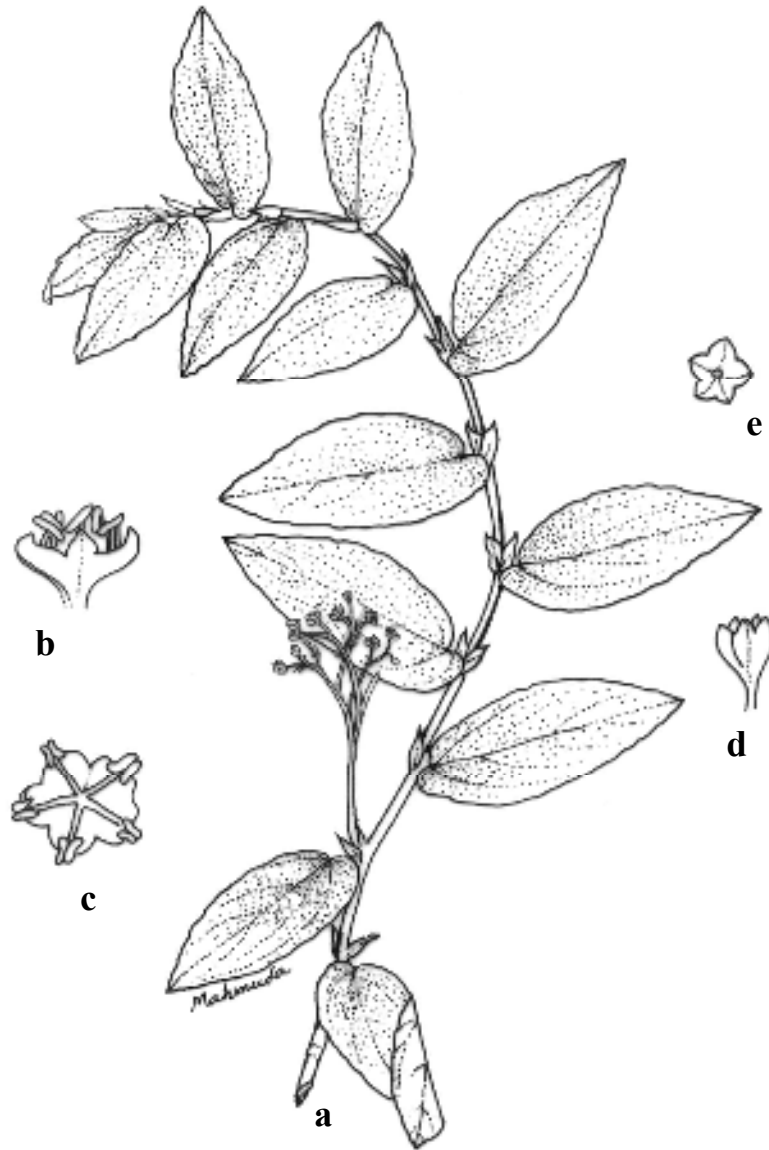


Figure 35. *Pellionia repens* (Lour.) Merr.: a) Flowering shoot; b) Male flower; c) Opened male flower; d) Female flower; e) Achene.

Phenax Wedd., Ann. Sci. Nat. Bot. Ser-4.1:191.1854.

Type species: *Phenax vulgaris* Wedd.

Perennial herbs or shrubs, rarely small trees, monoecious or rarely dioecious, pubescent but without stinging hairs. Leaves alternate, petiolate; stipules present, free, persistent or deciduous, margins serrate to crenate, with 3 or 5 nerves coming out from the base, with punctiform cistolith. Inflorescences unisexual or bisexual, in the form of dense axillary glomerules. Male flowers: tepals (3) 4 (5), lobes ovate, valvete or slightly imbricate, connate in the lower half, often acuminate or mucronate at apex; stamens (3) 4 (5); pistillode present, glabrous or pubescent. Female flowers: perianth absent, bracts present at base, hialine to scarious, somewhat periantiformes; ovary ovate, glabrous or margin pillose, stigma linear to filiform, often persistent; staminodes absent. Achenes covered with bracts, sessile or shortly stipulated, flattened, smooth to pustulated.

Note: The genus is confused with *Boehmeria* often, but is distinguished by the characters related to the achenes: in *Boehmeria* those are very difficult to separate from the perianth and can not be found loose in a dissection of the inflorescence; however in *Phenax* they are easy to be found between the bracts during a dissection of the inflorescence.

Phenax mexicanus Wedd., Ann. Sci. Nat. Bot. 4(1): 193. 1854. Uddin *et al.*, Bull. Bangladesh National Herb. 4: 19. 2015. **Fig. 36.**

English name: Ghostweed

Monoecious shrubs or small trees, 2-6 m tall, leafy internodes 3-25 mm long, sparsely to densely puberulent with slender hairs 0.1-0.5 mm long, drying reddish-brown and longitudinally ridged. Leaves quite variable in size, blades narrowly elliptic to lanceolate, broadest at or below the middle, 1.5-15 × 2-5 cm, long-acuminate, obtuse or rounded at subequal base, margin crenate to serrate with 3 to 6 teeth per cm, stiff-chartaceous, above glabrous or minute scattered hairs, very rarely rugose in age, sparsely puberulent on the veins beneath, venation palmate with 3 primary veins, midvein usually with 2 pairs of secondary veins in the distal half. Stipules 4-7 × 1 mm, lanceolate, deciduous or persistent. Petioles 3-18 (50) mm long, minutely appressed puberulent.



Figure 36. *Phenax mexicanus* Wedd.: a) Flowering shoot.

Inflorescences small, 4-10 mm diameter, globose axillary clusters or glomerules often persisting at leafless nodes, brown. Male flowers: 2 mm broad before anthesis, perianth parts acute or obtuse at the apex, anther about 1 mm long. Female flowers: enclosed in perianth-like bracts 2 mm long, ovary about 0.5 mm long, style 3-4 mm long, minutely puberulent. Fruits about 0.7×0.6 mm, slightly, flattened, ovoid, smooth. *Fl. & fr.*: 1-12. *Wet thickets, evergreen-rain forests, often on rocky stream banks; between 300-800 m altitudes.*

Rangamati: Fring Kheong beat, Karnaphuli Forest Range, Kaptai, 15 xii 2010, *S.N. Uddin*, N-4429 (DACB 41785); Karnaphuli Sadar Beat, Kaptai, 12 v 2010, *S.N. Uddin*, N-4271 (DACB); Monlovi chara, Pharu Reserved Forest, Bilaichari, 14 x 2008, *S.N. Uddin*, N-2960 (DACB 41785); 21 vii 2009, *S.N. Uddin*, N-3752 (DACB).

Mexico to Panama.

Pilea Lindl., Coll. Bot.: t. 4. 1821.

Type species: *Pilea muscosa* Lindl.

Monoecious or dioecious, succulent herbs or shrubs, without stinging hairs. Leaves simple, petiolate, opposite, equal or unequal in pairs, rarely alternate; stipules in pairs, deciduous or persistent, axillary or interpetiolar, membranous or herbaceous; leaf blades 3-veined or rarely pinnately veined, base symmetric or asymmetric, margin serrate, crenate, dentate, or entire; cystoliths usually linear. Inflorescences axillary, solitary or in pairs, glomerules usually forming loose, dichotomous cymes or paniculate cymes, spikes or in dense, globose capitula of unisexual or polygamous; bracts small, green. Male flowers: perianth lobes 4 or 5, valvate or imbricate; stamens 4 or 5; filaments inflexed in bud; rudimentary ovary small to inconspicuous. Female flowers: perianth lobes 3(-5), subequal or strongly unequal, in fruit enlarged, when 3-lobed, the abaxial one boat-shaped, often with a corniculate appendix near apex; staminodes opposite to segments, scale-like, usually oblong, minute or inconspicuous, in fruit enlarged. Ovary straight, unilocular, often with oblique apex; stigma sessile, shortly penicillate; ovule orthotropous. Fruit an ellipsoid or ovoid achene, compressed, without crested appendix at apex, partly enclosed by persistent perianth. Seeds with scanty endosperm; cotyledons broad.

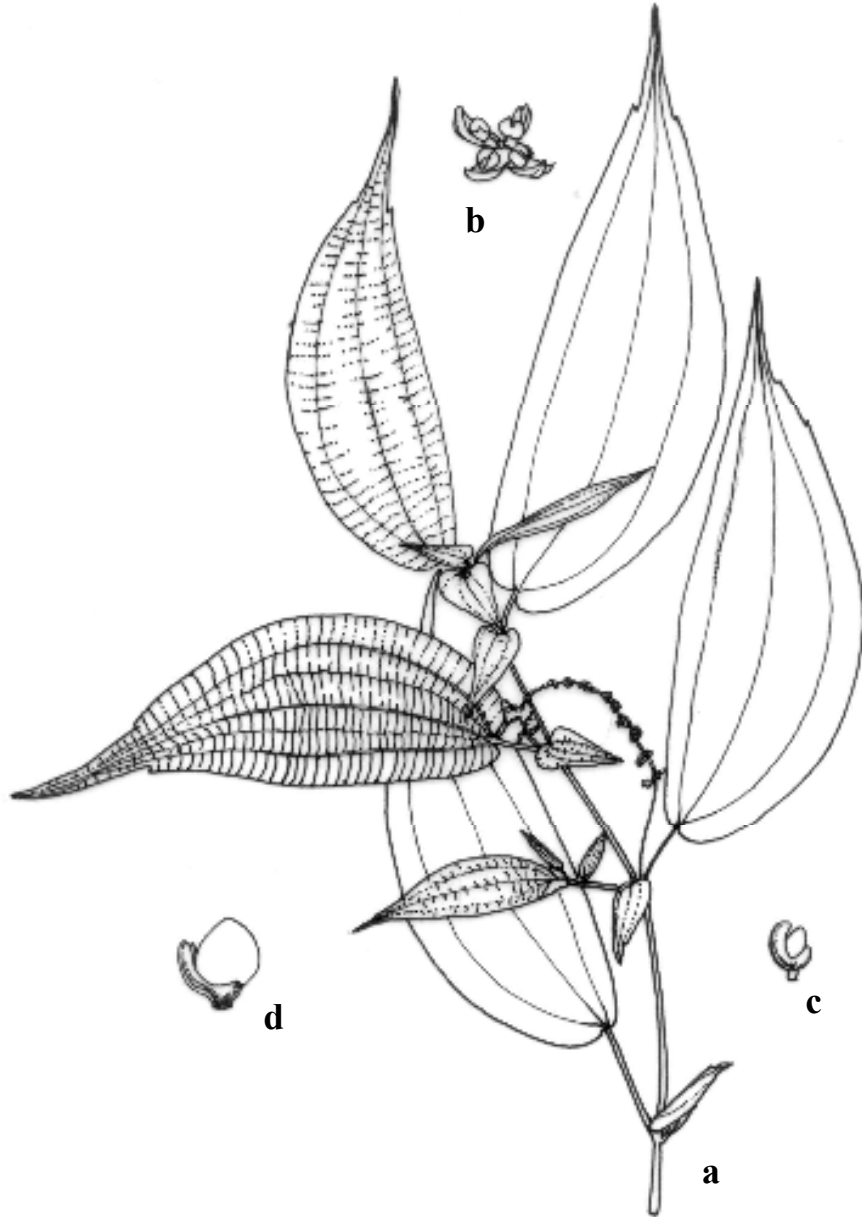


Figure 37. *Pilea anisophylla* Wedd.: a) Flowering shoot; b) Male flower; c) Female flower; d) Achene with persistent perianth.

1. Leaves pinnately veined	P. microphylla
+ Leaves strongly 3-veined	2
2. Female perianth lobes often subequal; male perianth lobes 4 or 5	P. cadierei
+ Female perianth lobes often unequal; male perianth lobes 2-4	3
3. Leaves of each pair very unequal, the larger over 5 times as long as the smaller	4
+ Leaves of each pair subequal or unequal but less than 5 times in size	5
4. Leaf blade at least on upper stem base distinctly peltate, lateral veins U-shaped; achene verrucose	P. insolens
+ Leaf blade basifixed, lateral veins spreading; achene smooth	P. anisophylla
5. Stipules oblong or oblong lanceolate, 4-12 mm long	P. bracteosa
+ Stipules triangular, 1-2 (-3) mm long	6
6. Male inflorescence shorter than leaves	P. glaberrima
+ Male inflorescence longer than leaves	P. melastomoides

Pilea anisophylla Wedd., Arch. Mus. Hist. Nat. 193. 1856. Hook.f., Fl. Brit. India 5: 552. 1888 (Indian repr. 1954); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 205 (1982); Kanjilal *et al.*, Fl. Assam 4: 283. 1940 (reprint 1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 20. 2015. *Pilea anisophylla* var. *robusta* Hook.f., Fl. Brit. India 5(15): 552. 1888. *Pilea secunda* S.S. Chien, Bull. Chin. Bot. Soc. 1(1): 4. 1935. **Fig. 37.**

Perennial, dioecious or monoecious, stoloniferous herbs, 20-150 cm tall. Stems ascending, simple or branched, succulent, glabrous or sparsely multicellular pubescent adaxially. stipules triangular-ovate, 1.5-2.0 mm long, herbaceous, persistent; petiole unequal in length, 0-2.5 cm long; Leaves opposite, anisomorphic; leaf blades strongly unequal in shape and size; ovate or oblong-lanceolate, 5-15 × 1.5-5.0 cm, base deeply or shallowly cordate, rarely rounded, margin entire or shallowly 1-3-serrate distally, apex caudate-acuminate; the larger blade falcate-lanceolate, pale green beneath, green above, asymmetric, membranous, 3-veined, lateral veins many, regularly transverse, reticulate, cystoliths minute, shortly fusiform, conspicuous on both surfaces, the smaller blade sessile, triangular-ovate, oblong, rarely falcate-lanceolate, 1.5-6.0 × 0.5-3.0 cm, base

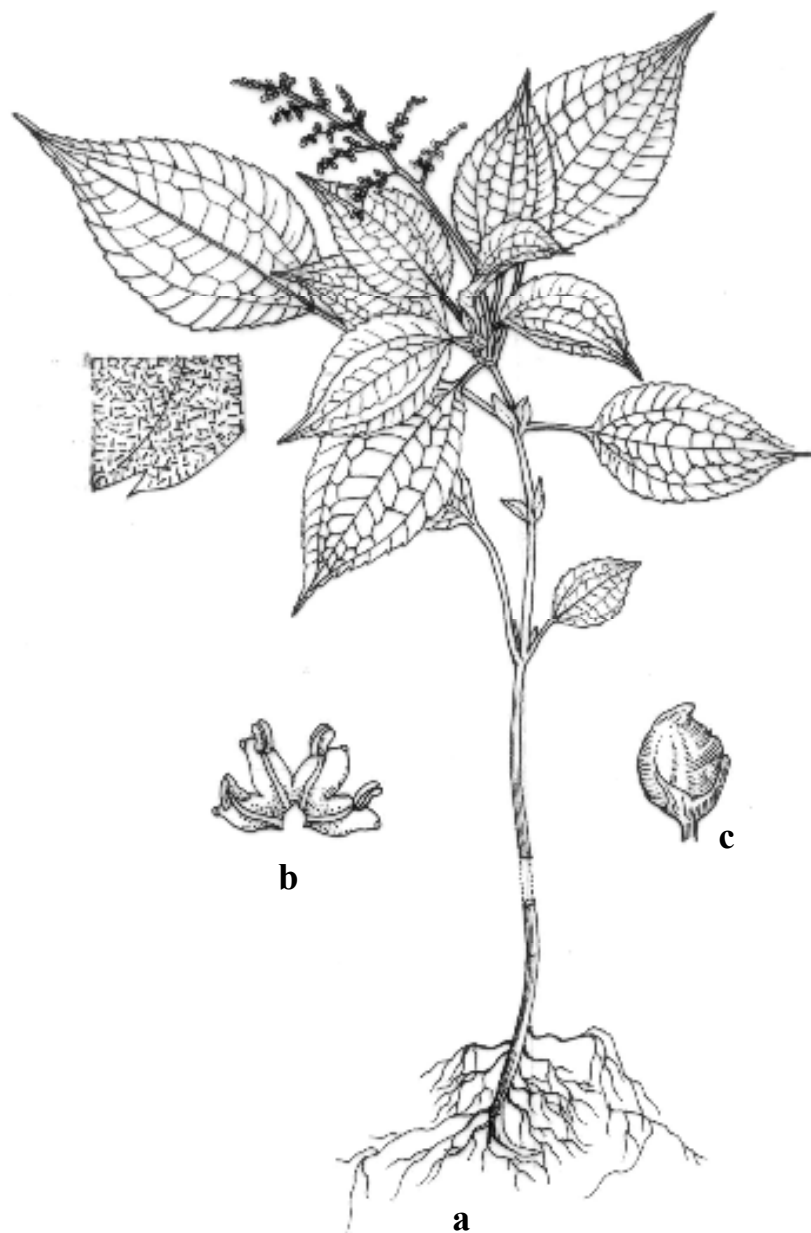


Figure 38. *Pilea bracteosa* Wedd.: a) Flowering plant; b) Open male flower; c) Achene with persistent perianth.

deeply cordate, almost around stem, rarely subrounded, margin entire or 1- or 2-serrulate near apex, apex acute or acuminate. Male inflorescences spike like, somewhat coiled distally, few branched, flowers loosely arranged along one side of axis, 3-12 cm long; female inflorescences paniculate cymes, branched, 2-6 cm long, glabrous. Male flowers: ca. 1.2 mm diameter, perianth lobes 4, ovate, connate half of length, subapically corniculate, stamens 4, rudimentary ovary minute, conic, pedicel 0-1 mm long. Female flowers: perianth lobes unequal, abaxial lobe hooded, half as long as achene, lateral 2 lobes triangular-ovate, half as long as abaxial lobe, membranous. Achenes brownish, ovoid, slightly oblique, ca. 1 mm long, slightly compressed, smooth, enclosed by persistent perianth. *Fl. & fr.*: 6-12. *Hilly evergreen forests, along streams; up to 1000 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4515 (K000708665-6).

Rangamati: Kaptai, Karnaphuli Sadar beat, 12 v 2010, *S.N. Uddin*, N-4272 (DACB 40389).

Bhutan, Nepal, India, Myanmar and China.

Pilea bracteosa Wedd., Arch. Mus. Hist. Nat. 9(1-2): 245. 1856-1857. Hook.f., Fl. Brit. India 5: 555. 1888 (Indian repr. 1954); Hara *et al.*, Enu. Fl. Pl. Nepal 3: 1205. 1982; Uddin *et al.*, Bull. Bangladesh National Herb. 4: 22. 2015. *Pilea obliqua* Hook.f., Fl. Brit. India 5: 558. 1888. *Pilea bracteosa* var. *striolata* Hand.-Mazz., Symb. Sin. 7(1): 137. 1929. **Fig. 38.**

Perennial, dioecious, stoloniferous herbs, up to 40 cm tall. Stems succulent on upper part, with galls on mid portion of internodes, subglabrous, bluish when dry. Leaves opposite, simple, anisomorphic; leaf blades broadly ovate or oblong, sometimes oblique, unequal in size, 3-9 × 2-4 cm, base rounded or subcordate, sometimes auriculate at base, apex acuminate or caudate-acuminate, margin crenate-serrate, paler green beneath, membranous, 3-veined, lateral veins many, subtransverse, cystoliths prominent adaxially; stipules oblong, 5-8 mm long, membranous, veinless, persistent, light green; petioles unequal in length, 1-7 cm long, sparsely puberulent. Inflorescences solitary, in upper stems, a paniculate cyme, 4-15 cm long; bracts triangular, over 2 mm long. Male flowers: pedicellate or sessile, rhombic-ovoid in bud, ca. 1 mm long; perianth lobes 4, connate half of length, 2 lobes subapically corniculate; stamens 4; rudimentary ovary small.



Figure 39. *Pilea cadierei* Gagnep. & Guillemin. a) Vegetative shoot.

Female flowers: subsessile, ca. 0.5 mm in bud; perianth lobes connate at base, unequal, lower one cymbiform, longer, subapically corniculate; staminodes 3, small, scale-like, oblong. Achenes broadly ovoid, ca. 0.8 mm diameter, compressed, oblique, with a raised brownish ring. $2n = 24$ (Kumar & Subramaniam, 1986). *Fl. & fr.*: 7-10. *Moist places in broad-leaved forests; up to 1000 m altitudes.*

East Bengal: Sylhet, 26 x 1885, *C.B. Clarke* (K 000708633).

Bhutan, India, Nepal and China.

Pilea cadierei Gagnep. & Guillemin, Bull. Mus. Natl. Hist. Nat., sér. 2. 10: 629. 1939. Afroz in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 423. 2009. **Fig. 39.**

English name: Aluminium Plant

Perennial, dioecious, rhizomatous herbs or subshrubs, glabrous. Stems erect, 15-50 cm tall, succulent, densely covered with cystoliths, woody at base. Leaves opposite, simple, petiolate; stipules caducous, green, brownish when dry, oblong, 10-13 mm long, papery, longitudinally 2-ribbed; petiole subequal in length, 0.5-1.5 cm long; leaf blades obovate, subequal, 2.5-6.0 × 1.5-3.0 cm, base broadly cuneate or subround, apex mucronate, margin obscurely dentate or erose, papery, 3-nerved, lateral nerves 3 in each side. Inflorescence in pairs, male inflorescence a capitulum, peduncles 1.5-4.0 cm long, glomerules 6-10 mm in diameter, bracts broadly ovate, ca 3 mm long. Male flowers: pear-shaped in bud, ca 2.5 mm long, pedicels 2-3 mm long; perianth lobes 4, cymbiform, connate half of the length, subapically corniculate; stamens 4; ovary rudimentary, conic. Female flowers: subsessile, perianth lobes 0.5-0.7 mm long, persistent, half as long as achene; staminodes oblong. Achenes ovoid, ca. 1.5 mm long, compressed. $2n = 48$ (Fedorov, 1969). *Fl. & fr.*: 9-12. *Cultivated in gardens, shady wet places in forests; between 200-500 m altitudes.*

Dhaka: Dhanmondi, 2 ii 1988, *B.M.R. Khatun*, RK-130 (DACB 6176).

Vietnam and China.

Cultivated in home garden as an ornamental plant.

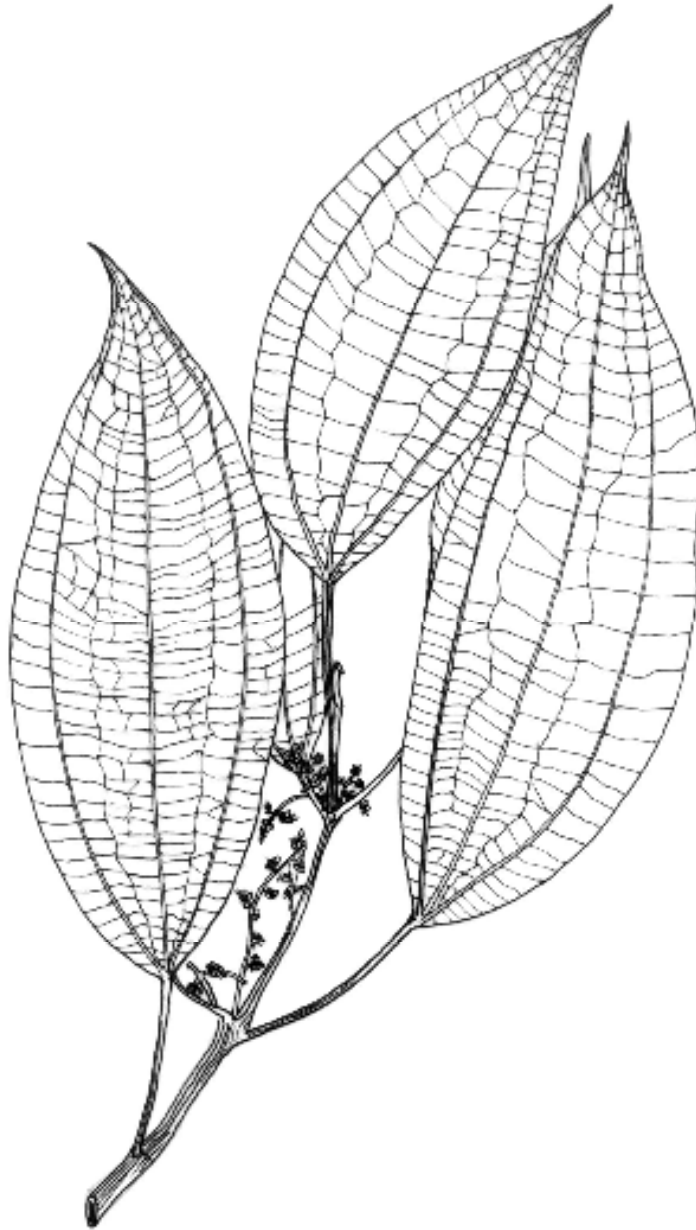


Figure 40. *Pilea glaberrima* (Blume) Blume: a) Flowering shoot.

Pilea glaberrima (Blume) Blume, Mus. Bot. 2(4): 54. 1856. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 205. 1982. *Urtica glaberrima* Blume, Bijdr. Fl. Ned. Ind. 10: 493-494. 1825. *Pilea smilacifolia* Wedd., Ann. Sci. Nat. Ser. 4, 1: 186. 1854. Hook.f., Fl. Brit. India 5: 553. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 721. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 66. 1925; Kanjilal *et al.*, Fl. Assam 4: 282. 1940 (reprint 1982); Afroz in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 425. 2009. *Pilea miconiifolia* Miq., Syst. Verz. Ind. Archip. 102. 1854. *Pilea goglado* Blume, Mus. Bot. 2(4): 53. 1856.

Fig. 40.

Local name: *Lata moricha*

Perennial herbs or under shrubs, glabrous, dioecious, rarely monoecious, stoloniferous. Stems 0.5-1.5 m tall, erect, ascending, or scandent, often branched, grey green, longitudinally many angled, woody at base, densely covered with cystoliths. Leaves opposite, simple; petiole unequal in length, 1.5-7.5 cm long; leaf blades asymmetric, unequal in size, ovate, elliptic, oblong or elliptic-lanceolate, 5-20 × 2.5-7.0 cm, base rounded, obtuse or cuneate, apex acuminate, margins shallowly serrate or shallowly crenate, upper half sometimes subentire, membranous, adaxially pale green, 3-veined, lateral veins many, transverse, reticulate, cystoliths adaxial, minute, often punctate or mixed with shortly fusiform ones, sometimes inconspicuous; Stipules triangular or lanceolate, persistent, connate at base, c. 2 mm, papery. Inflorescences solitary, very variable in length and form, dense-flowered or lax, dichotomously branched, male a paniculate cyme, usually shorter than subtending petiole; female ones much shorter. Male flowers: sessile, in bud c. 1 mm diameter; perianth lobes 4; stamens 4; rudimentary ovary small, subulate. Female flowers: subsessile, in bud c. 0.5-0.7 mm in diameter; perianth lobes connate at base, unequal, abaxial lobe cymbiform, longer, subapically corniculate; staminodes 3, inconspicuous, scale-like, oblong. Achenes brownish red, ovoid, c. 1 mm long, compressed, inconspicuously verrucose. *Fl. & fr.*: 5-11. *Broad-leaved evergreen forests, shady and wet places along streams; up to 800 m altitudes.*

Bandarban: Ruma, Rijak, 30 x 1984, *M.S. Khan et al.*, K-6819 (DACB 6112). **Chattogram:** Dohajari, Dhopachari, Challanchari, 11 vi 2001, *S.N. Uddin*, N-988 (DACB 34104). **Moulvibazar:** Guishapgiri, 3 v 1998, *M.A Rahman et al.*, 2876 (DACB 29038); Kamalgonj, Adampur Forest Beat, 20 ix 2011, *S.N. Uddin*, N-4751 (DACB 37311); Kamalgonj, Adampur, 19 v 2014, *B. Khan et al.*, B-3104 (DACB 40936). **Rangamati:** Rampahar, Kaptai, 28 v 2003, *S.N. Uddin*, N-1866 (DACB 37130).

Bhutan, Sikkim, India, Nepal, Myanmar, Indonesia and China.

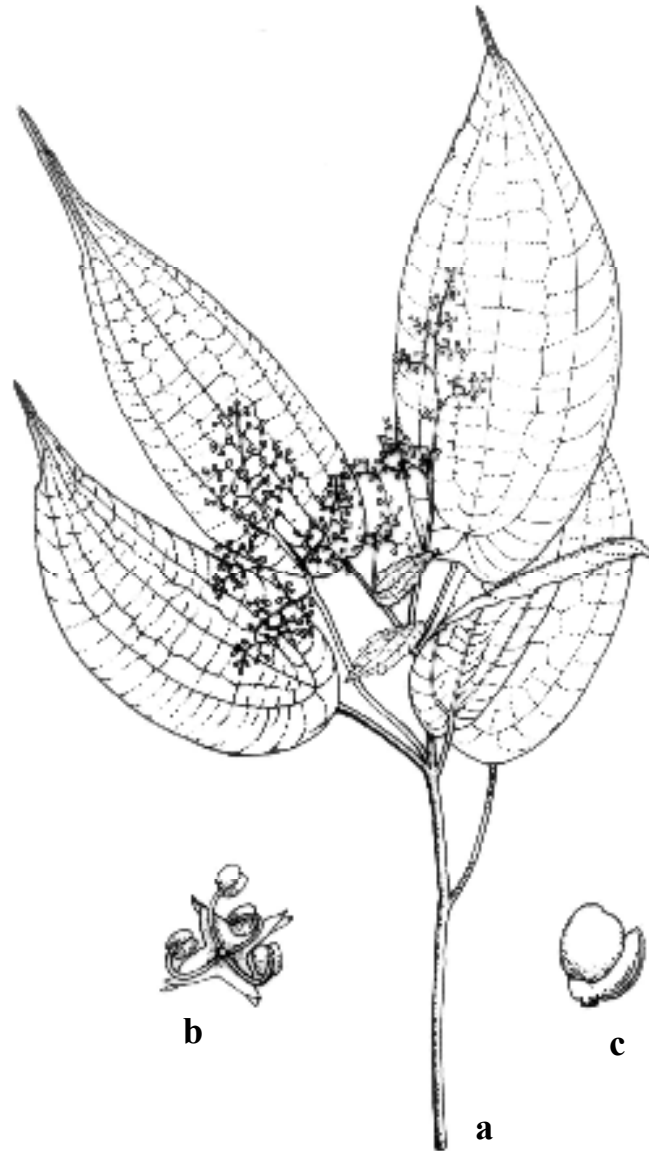


Figure 41. *Pilea insolens* Wedd.: a) Flowering shoot; b) Male flower; c) Achene with persistent perianth.

Pilea insolens Wedd. in Candolle, Prodr. 16(1): 118. 1869. Hook.f., Fl. Brit. India 5: 552. 1888 (Indian repr. 1954); Kanjilal *et al.*, Fl. Assam 4: 283. 1940 (reprint 1982); Uddin *et al.*, Bull. Bangladesh National Herb. 4: 23. 2015. *Pilea anisophylla* Wedd. var. *khasiana* Hook.f., Fl. Brit. India 5: 552. 1888. *Pilea khasiana* (Hook. f.) C.J. Chen, Bull. Bot. Res., Harbin 2(3): 111. 1982. **Fig. 41.**

Perennial, dioecious or monoecious, stoloniferous herbs, 20-50 cm tall. Stems simple, soft, succulent, internodes long. Leaves opposite, simple, very anisomorphic; leaf blades pale green beneath, green above, the larger blade oblong-ovate, 5-13 × 3-6 cm, asymmetric, strongly unequal in shape and size, sometimes reduced into alternate leaves, base distinctly peltate or deeply cordate in basifixed leaves, margin entire or with a few small teeth near apex, apex caudate-acuminate, membranous, 3-veined, basal lateral veins U-shaped near origin, lateral veins many, regularly transverse, reticulate, cystoliths minute, shortly fusiform, conspicuous on both surfaces; the minor blade ovate, 1.5-4.0 × 0.8-2.0 cm, base deeply cordate, almost around stem, or subtruncate, apex acute, margin entire but with a few small teeth near apex; stipules triangular-ovate, 1.5-2.0 mm long, membranous, persistent; petiole strongly unequal in length, up to 5 cm long. Male inflorescence spike like, somewhat coiled distally, few branched, 5-14 cm long, flowers loosely arranged along one side of axis; female inflorescence a paniculate cyme, much branched, up to 5 cm long; bracts triangular-ovate, ca. 3 mm long. Male flowers: ca. 2.5 mm diameter; pedicel thin, ca. 2 mm long; perianth lobes 4, ovate, connate for about half length, apex caudate; stamens 4; rudimentary ovary minute, conic. Female flowers: perianth lobes unequal, lower lobe hooded, about half as long as achene, lateral 2 lobes triangular-ovate, ca. half as long as lower lobe, membranous. Achene brownish, ovoid, ca. 1.2 mm diameter, slightly compressed, slightly oblique, verrucose, enclosed by persistent perianth. *Fl. & fr.*: 6-10. *Shady and moist places in evergreen and broad-leaved mixed forests, near streams; up to 1000 m altitudes.*

East Bengal: Locality and date unknown, Griffith, 4525 (Iso Type K 000708663-4 & CAL 0000014550).

Bhutan, India, Nepal and China.



Figure 42. *Pilea melastomoides* (Poir.) Wedd.: a) Flowering shoot; b) Achene.

Pilea melastomoides (Poir.) Wedd., Ann. Sci. Nat., Bot., sér. 4. 1: 186. 1854. Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 424. 2009. *Urtica melastomoides* Poir., Encycl. Suppl. 4(1): 223. 1816. *Urtica trinervia* Roxb., Fl. Ind., ed. 1832, 3: 582. 1832. *Pilea trinervia* (Roxb.) Wight, Icon. Pl. Ind. Orient. 6: 9, pl. 1973. 1853. *Pilea ovatinucula* Hayata, Icon. Pl. Formosan. 6: 48-49. 1916. *Pilea cuneatifolia* Yamam., Icon. Pl. Formosan. Suppl. 1: 5. 1925. **Fig. 42.**

Perennial, stoloniferous, monoecious or dioecious herbs or shrubs, up to 2 m high. Stems glabrous, blue green when dry, succulent distally, woody at base, swollen between nodes, upper internodes shorter. Leaves opposite, simple; stipules persistent, triangular, ca. 2 mm long, membranous; petiole equal in length, 2-9 cm long; leaf blades elliptic to elliptic-lanceolate, subequal, 10-25 × 5-15 cm, base cuneate or rarely subrounded, apex cuspidate or acuminate, margin shallowly serrate or crenate, membranous, pale green beneath, dark green or brownish above, 3-nerved, lateral nerves many, cystoliths fusiform, minute. Inflorescences axillary, solitary; male inflorescence a cymose-panicle, 15-35 cm long, peduncle long and thick; female ones often shorter than petioles. Male flowers: subsessile, in bud ca. 1 mm long; perianth lobes 4, elliptic, apex acute or corniculate, 4 mm across; stamens 4, filaments ca 3 mm long; rudimentary ovary minute. Female flowers: subsessile, in bud ca. 0.8 mm long; 1.5 mm across in mature flower; perianth lobes 3, imbricate, connate at base, subequal, abaxial lobe larger, subapically corniculate; staminodes 3, scale-like, oblong; ovary ovate-rounded. Achenes ellipsoid-ovoid, ca. 1 mm, compressed, brownish, smooth or verrucose, with a slightly elevated ring by margin. *Fl. & fr.*: 8-11. *Evergreen forests, shady and wet places by streams; between 300-600 m altitudes.*

Moulvibazar: Barolekha, Madhabkundu Eco-park, 21 iv 2014, *S.N. Uddin*, N-5553 (DACB).

Sri Lanka, India, Myanmar, China, Vietnam and Indonesia.

Pilea microphylla (L.) Liebm., Mexic. Neldeagt. Pl. 5(2): 302. 1851. Prain, Beng. Pl. 2: 722. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 66. 1925; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 424. 2009. *Parietaria microphylla* L., Syst. Nat., ed. 10, 2: 1308. 1759. *Urtica microphylla* (L.) Sw., Kongl. Vetensk. Acad. Handl. 8: 66. 1787. *Urtica serpyllacea* Kunth, Nov. Gen. Sp. 2: 37. 1817. *Urtica herniarifolia* Willd., Sp. Pl. 4: 359. 1805. *Pilea muscosa* Lindl., Coll. Bot. t. 4. 1821. *Urtica portulacoides*



Figure 43. *Pilea microphylla* (L.) Liebm.: a) Flowering plant.

Spreng., *Neue Entdeck. Pflanzenk.* 3: 21. 1822. *Dubrueilia microphylla* (L.) Gaudich., *Voy. Uranie* 495. 1830. *Pilea succulenta* Hook.f., *Trans. Linn. Soc. London* 20: 182. 1847. *Pilea serpyllacea* (Kunth) Liebm., *Mexic. Neldeagt. Pl.* V, 2: 296. 1851. *Pilea portula* Liebm., *Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd., ser. 5, 2: 297.* 1851. *Adicea microphylla* Kuntze, *Revis. Gen. Pl.* 2: 622. 1891. **Fig. 43.**

Local name: *Lata maricha* English names: Artillery Plant, Gunpowder Plant.

Annual, monoecious, prostrate or procumbent herbs. Stems erect or ascending when older, blue-green when dry, simple or branched, 3-17 cm tall, succulent, cystoliths dense, usually glabrous, often short side-shoots present in leaf axils. Leaves opposite, very unequal pair, simple; stipules persistent, triangular, ca. 0.5 mm long, membranous; petioles filiform, unequal in length, 1-4 mm long; leaf blades obovate, spatulate, elliptic or elliptic-ovate, 3-10 × 1.5-5.0 mm, entire, rounded to cuneate at the base, rounded to obtuse at the apex, glabrous, succulent, papery when dry, pale green beneath, green above, midvein indistinct distally, lateral veins several, indistinct, abaxial surface honeycombed, cystoliths linear, adaxial, regularly transverse. Inflorescences axillary, often androgynous, compactly cymose-capitate; sessile or with 1.5-6.0 mm long peduncle; glomerules with few male and 5-10 female flowers. Male flowers: pedicellate, ca. 0.7 mm long; 1.2-1.5 mm diameter, perianth lobes 4, free, ovate, subapically corniculate, yellowish-green; stamens 4, filaments c 1 mm long; rudimentary ovary minute, conic. Female flowers: small, ca. 0.4-0.5 mm diameter; perianths 2-4 toothed, subequal, oblong, longer lobe subequal to achene, valvate. Ovary superior, ellipsoid, small, 0.5 mm long, unilocular. Fruit an oblong or ellipsoid achene, 0.4-0.6 mm long, compressed, smooth, brown, enclosed by persistent perianth. $2n = 36$ (Kumar and Subramaniam, 1986). *Fl. & fr.:* 6-10. *Old walls, dams, roads and pathways, also cultivated in gardens and as a pot plant.*

Dhaka: Dhaka University, Rokeya Hall, 9 xii 1984, *M.M. Rahman*, 15 (DUSH); Curzon Hall, 19 iii 1968, *R. Roy*, 37 (DUSH); Ayubnagar, 19 x 1968, *Panna*, 66 (DUSH); R.K. Mission, 30 xi 1960, *P. Sarma*, (DUSH); Dhaka Hall, 19 xi 1969, *M.N.R. Bhuiyan*, 169 (DUSH); Botanical Garden, DU, 7 xi 1953, *M. Shahjahan*, (DUSH); Rokeya Hall, 13 v 1969, *Rokeya*, 144 (DUSH); F.H. Hall Lawn, 27 xi 1964, *A. Malek*, 11 (DUSH); Hatkhola, 20 v 1961, *Y.A. Saeed*, 100 (DUSH); Sadarghat, 9 v 1968, *D.R. Akhtary*, 201 (DUSH); Ramna, 4 iv 1968, *N.I. Khan*, 57 (DUSH); Curzon Hall Campus, 12 vii 1968, *R. Roy*, 137 (DUSH); Armanitala, Beeharumdeuri, 17 ix 1978, *M.A. Hassan et al.*, H-3851 (DACB 6169); Baldha Garden, 30 vi 1978, *Mahbuba Halim*, 189 (DACB 6173); Mirpur,

National Botanic Garden, 27 xii 2011, *S.S. Shetu*, 64 (JUH); National Herbarium Campus, 1 i 2014, *E.H. Khokon*, EHK-61, (DACB 39226); Jahangirnagar University Campus, Savar, 3 vi 1998, *B.M. Khatun*, RK-1343 (DACB 30,988); Nabinagar, Savar, 4 vi 1999, *B.M. Khatun*, RK-1840 (DACB 29913); Sonargaon, 3 x 1977, *A.M. Huq and M.M. Rahman*, H-3512 (DACB 6171); **Gazipur**: Kashimpur, 29 xi 1973, *M.S. Khan and A.M. Huq*, K-3434 (DACB). **Jashore**: Puler Hat, 23 v 1989, *Amena*, 1 (DUSH). **Mymensingh**: Muktagacha, Rajbari, 7 iv 1976, *A.M. Huq and M.K. Mia*, H-2341 (DACB 6168). **Rajshahi**: Rajshahi Town, 27 x 1989, *M.K. Mia*, M-2459 (DACB 6175). **Sylhet**: Patharia 29 iii 1981, *M.S. Khan*, K-6286 (DACB 6166). **Tangail**: Ghatail, Kadamtali, Garatta, 18 vi 2015, *K.K. Islam*, KKI-40 (DACB 42182).

Native to South and Central America, wide spread in Africa and Asia.

Infusion of plant is used as diuretic and tonic. It is used to treat liver and urinary inflammation, diarrhoea and asthma. Crusted plant is used in the treatment of sores and bruises (Ullah, 2009).

Poikilospermum Zipp. ex Miq., Ann. Mus. Bot. Lugduno-Batavi. 1: 203. 1864.

Type species: *Poikilospermum amboinense* Zipp. & Miq.

Shrubs or woody climbers, without stinging hairs. Leaves alternate, petiolate; stipules often caducous, intrapetiolar, connate, leathery; leaf blades often large, leathery, often prominently pinnately veined, margin entire; cystoliths in circular groups adaxially, along veins abaxially, either punctiform or linear. Inflorescences of solitary, axillary, dichotomously branched cymes, unisexual (plants dioecious); glomerules capitate, on swollen peduncular receptacles, in agglomerations, or free. Male flowers: perianth lobes 2-4, free or slightly connate; stamens 2-4, filaments straight or inflexed; rudimentary ovary present. Female flowers: perianth lobes 4, clavate-tubular, decussate-imbricate. Ovary enclosed; style short; stigma capitate or ligulate; ovule orthotropous. Achenes oblong, ellipsoid, or ovoid, slightly compressed, either enclosed by persistent perianth or exerted from it; pericarp easily separating into 2 valves. Seeds with little or no endosperm; cotyledons ovate.

Note: The genus *Poikilospermum* is sometime placed under the family Cecropiaceae in some system of plant classification.

Poikilospermum suaveolens (Blume) Merr., Contr. Arnold Arbor. 8: 47. 1934. Hassan & Afroz in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 7: 186. 2009. *Conocephalus suaveolens* Blume, Bijdr. Fl. Ned. Ind. 484. 1825. Hook.f., Fl. Brit. India 5: 545. 1888 (Indian repr. 1954); Heinig, List Chittagong: 66. 1925. Kurz, Forest Fl. Brit. Burma 2: 430. 1877 (Repr. 1974). *Conocephalus sinensis* C.H. Wright, J. Linn. Soc., Bot. 26: 471. 1890. *Poikilospermum sinense* (C.H. Wright) Merr., Contr. Arnold Arbor. 8: 51. 1934. **Fig. 44.**

Local names: *Jog-Kag*, *Kom lata*

Perennial, large woody climbers. Branchlets gray-brown when dry; stipular and petiolar scars prominent, pubescent or glabrous. Stipules often persistent in upper nodes, strongly crescent-shaped, 2-4 cm; petiole 5-10 cm, glabrous; leaf blades broadly ovate, elliptic, or obovate, 10-35 × 7-23 cm, lateral veins 7-14 pairs, both surfaces glabrous, base broad cuneate, rounded, or cordate, apex obtuse or acute. Male inflorescences dichotomously branched 2-3 times, 3.5-6 × 3-7 cm; bracts boat-shaped, 6-10 mm; glomerules 5-7 mm in diam. Female inflorescences dichotomously branched 1 or 2 times, 4-8 × 5-9 cm; primary peduncle longer than secondary; bracts as males; glomerules 2.5-3.5 cm in diameter, 3.5-5 cm in diameter in fruit. Male flowers: sessile, obovoid, 1.5-2.0 mm long; perianth lobes 4, apex incurved, pubescent; stamens 4; filaments straight, short. Female flowers: pedicel 3-7 mm long; stigma shortly ligulate. Achenes oblong-obovoid, 3-5 mm long, verrucose. *Fl. & fr.*: 4-6. *Moist places, rain forests, monsoon forests, near streams; up to 600 m altitudes.*

Chittagong Hill Tracts: 15 vi 1886, King 491 (CAL). **Cox's Bazar:** Upper Rezu, (Dhoapalong Range, Sonachari), 18 v 1999, AM Huq & MK Mia, H 10579 (DACB). **Moulvibazar:** Kamlganj, Adampur, 7 iii 2011, SN Uddin, N-4492 (DACB).

India, Indonesia, Malaysia, Philippines, Thailand, Vietnam and China.

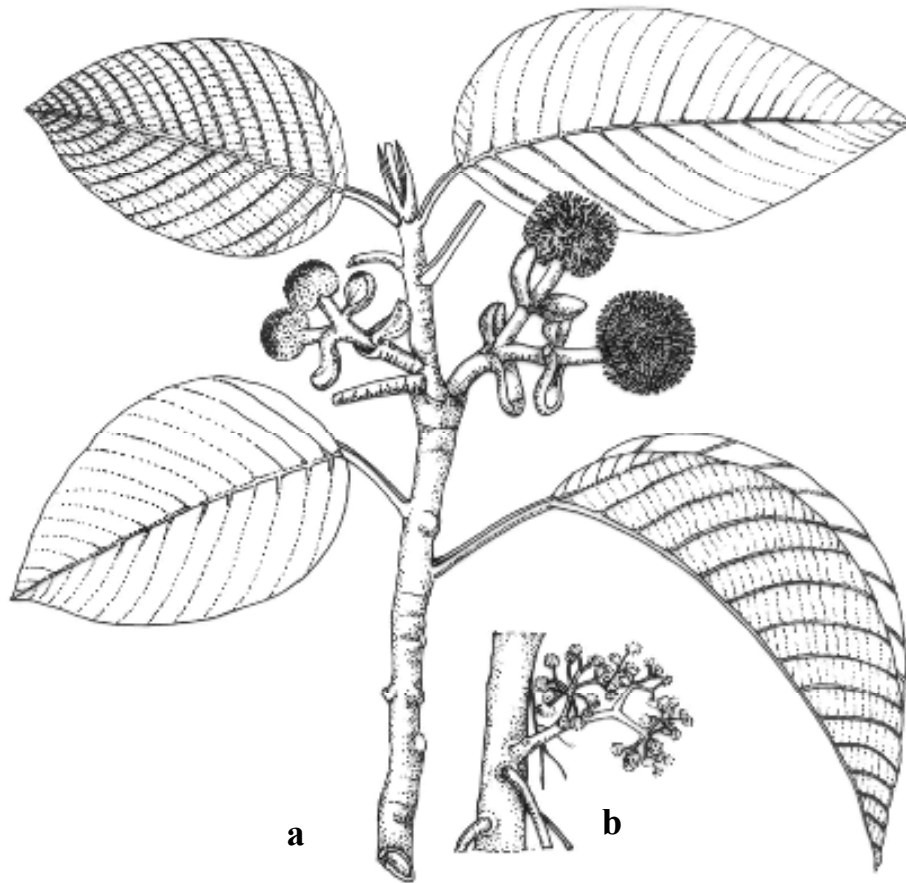


Figure 44. *Poikilospermum suaveolens* (Blume) Merr.: a) Female flowering shoot; b) Male inflorescence.

Pouzolzia Gaudich. in Freyc., Voy. Bot.: 503. 1826.

Type species: *Pouzolzia laevigata* (Poir.) Gaudich.

Monoecious, rarely dioecious herbs or shrubs, without stinging hairs. Leaves alternate, sometimes opposite, simple, petiolate or sessile; stipules often persistent, lateral, free; leaf blades chartaceous, upper leaves sometimes grading into bracts, margins serrate, dentate, or entire, often 3-nerved or triplinerved, cystoliths punctiform. Inflorescences axillary glomerules, or rarely at nodes along rachis of spikes or short-peduncled cymes, bisexual or rarely unisexual; bracts and bracteoles small by reduction of upper leaves. Male flowers: pedicellate, perianth lobes (3 or) 4 or 5, connate ca. half of length, valvate, apex acute or acuminate, convex or inflexed above the middle; stamens 4 or 5; filaments inflexed in bud; rudimentary ovary present. Female flowers: sessile or sessile, perianth tubular, often ovoid, beaked, constricted, 2-4 dentate; ovary superior, free, style filiform, laterally villous along one side and stigmatic, ovules erect. Fruit an achene, pericarp often crustaceous, lustrous, enclosed in an accrescent, ribbed or winged perianth.

KEY TO THE SPECIES

- | | |
|--|---------------------|
| 1. Shrubs or small trees; leaves alternate, margin serrate or dentate | P. sanguinea |
| + Herbs or subshrubs; leaves opposite at least in lower portion, margin entire | P. zeylanica |

Pouzolzia sanguinea (Blume) Merr., J. Straits Branch Roy. Asiat. Soc. 84: 233. 1921. Hara *et al.*, Enu. Fl. Pl. Nepal 3: 206 (1982); Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 426. 2009. *Urtica sanguinea* Blume, Bijdr. Fl. Ned. Ind. 501. 1826. *Boehmeria sanguinea* (Blume) Hassk., Cat. Hort. Bot. Bogor. 79. 1844. *Boehmeria nepalensis* Wedd., Arch. Mus. Hist. Nat. 8: 383. 1856. *Pouzolzia ovalis* Miq., Pl. Jungh. 1: 24. 1851. *Pouzolzia viminea* (Wedd.) Wedd., Prodr. 16(1): 228. 1869. Kurz, Forest Fl. Brit. Burma 2: 425. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 581. 1888 (Indian repr. 1954); Brandis, Indian Trees 617. 1906; Cowan & Cowan, Tree North Beng.: 129. 1929; Kanjilal *et al.*, Fl. Assam 4: 290. 1940 (reprint 1982). **Fig. 45.**

Monoecious shrubs, up to 3.0 m tall. Branches densely or sparsely strigose, upper shoots rarely leafless and with glomerules at the nodes. Leaves simple, alternate; stipules lanceolate, 3-5 mm long, sometimes inconspicuous; petioles 2-10 cm long; leaf blades

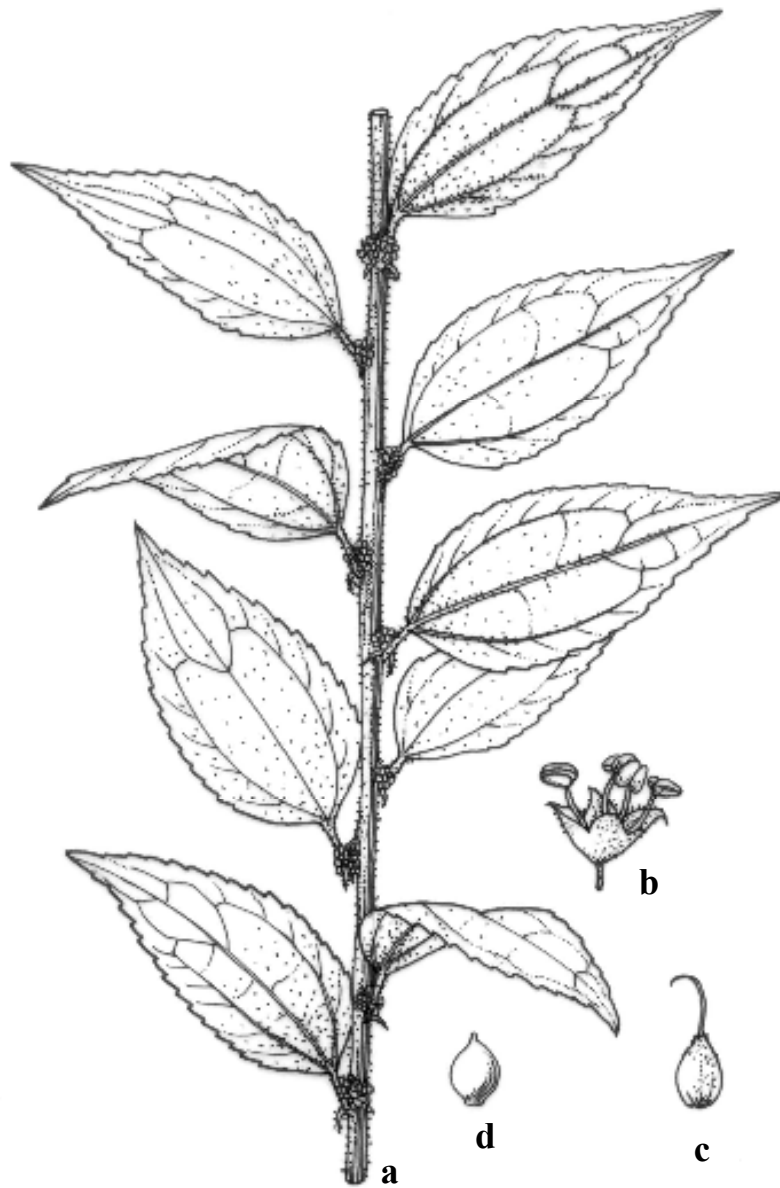


Figure 45. *Pouzolzia sanguinea* (Blume) Merr.: a) Flowering shoot; b) Male flower; c) Female Flower: d) Achene.

ovate-oblong or lanceolate, 3-18 × 1.5-8.0 cm, base obtuse, rounded or rarely subcordate, apex acuminate, margin dentate or serrate, papery, strigose or densely pubescent beneath, scabrous above, secondary nerves 2 apical pairs. Glomerules often unisexual on distal nodes, bisexual on proximal nodes, mostly axillary but sometimes forming almost leafless lateral spikes, reddish, 3-7 mm in diameter; bracts narrowly ovate, 2-4 mm long. Male flowers: perianth lobes 4, connate to middle, strigose, apex acute. Female flowers: perianth tube ellipsoid or rhomboid, 0.8-1.2 mm long, up to 2 mm long in fruits, pubescent, inconspicuously 3- or 4-toothed. Fruit an achene, ovoid, slightly compressed, 1.0-1.6 mm long, grey-yellow, enclosed in wingless perianth. $2n = 52$ (Kumar and Subramaniam, 1986). *Fl. & fr.*: 4-8. *Evergreen broad-leaved forests, thickets, edges of woods, dry valleys, roadsides; between 300-700 m altitudes.*

Bandarban: Thanchi, 01 iii 2013, *S.N. Uddin*, N-5127 (DACB 41839); Ruma, Raijak, 30 x 1984, *M.S. Khan*, K-6818 (DACB 6111). **Chattogram:** Bariyadhala to Hazarikhil, 29 x 1978, *A.M. Huq*, H-3977 (DACB 6108); Baraiyadhala Rest House to Kamaldhar, 25 vi 1979, *M.K. Mia & M.M. Rahman*, M-187 (DACB 6103); 14 x 1978, *M.S. Khan & A.M. Huq*, K-5186 (DUSH). **Cox's Bazar:** Teknaf, 27 viii 1984, *M.K. Alam*, 5278 (BFRI). **Khagrachari:** Matiranga, 26 vi 1985, *A.M. Huq & M.M. Mia*, H-7184 (DACB 6197); Panchari, Gomoti, 23 iv 2011, *S.N. Uddin*, N-4580 (DACB 37131). **Nawabgonj:** Kalayanpur Horticultur Centre, 5 ix 2002, B.M.R. Khatun, RK-3982, (DACB 30,485). **Natore:** Chalan beel, 10 xii 1972, *A.M. Huq*, H-535 (DACB). **Rangamati:** Bilaichari, Pharua Reserve Forest, 14 x 2008, *B. Khan et al.*, B-1099 (DACB 33341); Jarultala (Silchari), Sitapahar, Kaptai, 24 iv 1997, *A.M. Huq*, H-10470 (DACB 41092). **Sylhet:** Jafflong, near Dauki Sangram Border, 2 x 1983, *A.M. Huq et al.*, H-6279 (DACB 6102).

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

Roots are used in the treatment of vomiting and boils. Ropes and fishing nets are made from the bark fibres of the plant. Leaves are eaten as vegetables.

Pouzolzia zeylanica (L.) Benn., *Pl. Jav. Rar.*: 67. 1838. Hara *et al.*, *Enu. Fl. Pl. Nepal* 3: 206. 1982; J.Sinclair, *Fl. Cox's Bazar*, 107 (1956); Ullah in Ahmed *et al.*, *Encycl. Fl. Fauna Bangladesh* 10: 427. 2009. *Parietaria zeylanica* L., *Sp. Pl.* 1052. 1753. *Parietaria indica* L., *Mant. Pl.* 128. 1767. *Urtica glomerata* Klein *ex Willd.*, *Sp. Pl.* 4(1): 361. 1805. *Boehmeria alienata* Willd., *Sp. Pl.* 4: 841. 1806. *Boehmeria nana* D.Don,

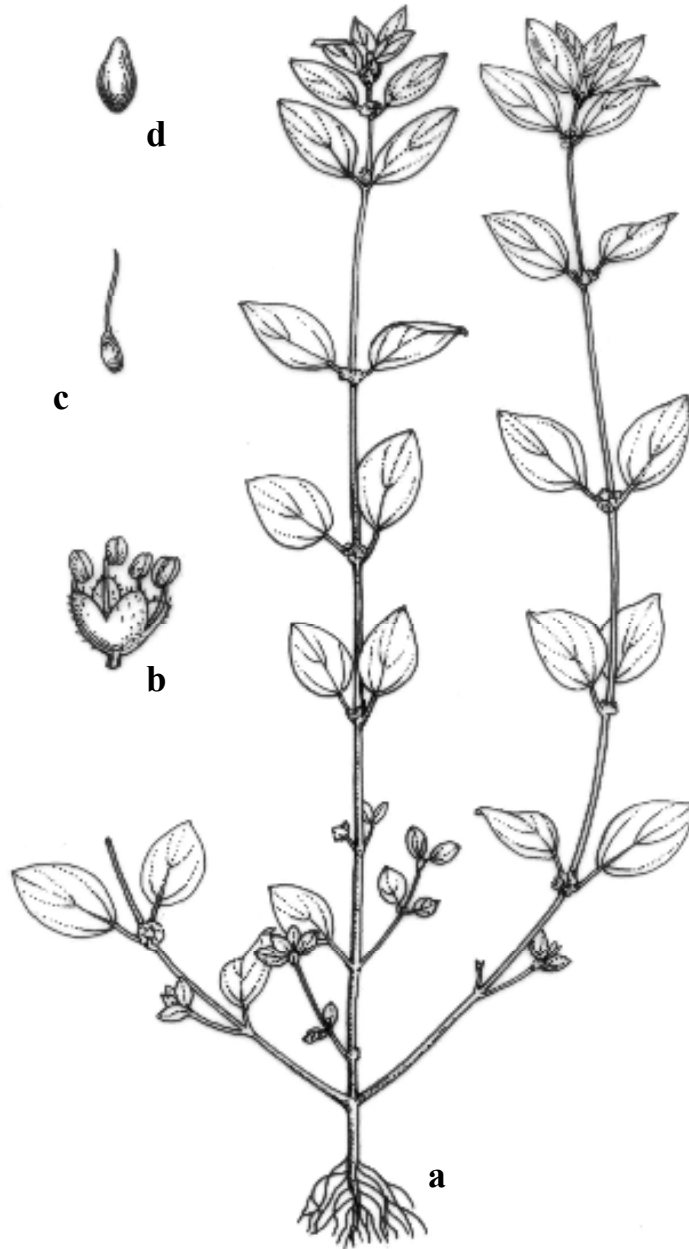


Figure 46. *Pouzolzia zeylanica* (L.) Benn.: a) Flowering shoot; b) Male flower; c) Female Flower; d) Achene.

Prodr. Fl. Nepal. 60. 1825. *Urtica nana* Buch.-Ham. ex D.Don, Prodr. Fl. Nepal.: 60. 1825. *Boehmeria cochinchinensis* Spreng., Syst. Veg. 3: 844. 1826. *Urtica parva* Blume, Bijdr.: 502. 1826. *Urtica strigosa* Blume, Bijdr. 495. 1826. *Pouzolzia indica* (L.) Gaudich., Voy. Uranie: 503. 1830; Kurz, Forest Fl. Brit. Burma 2: 424. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 581. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 724. 1903 (Indian reprint ed. 1963); Heinig, List Chittagong: 67. 1925; Kanjilal *et al.*, Fl. Assam 4: 291. 1940 (reprint 1982). *Boehmeria glochidiata* Hassk., Pl. Jav. Rar.: 206. 1848. **Fig. 46.**

Local name: *Kullaruki*

English name: Pouzolzia

Perennial herbs, up to 40 cm tall. Stems erect or ascending, rarely prostrate, few branched at base, strigillose; rootstock often tuberous. Leaves opposite in lower portion, sometimes alternate on lower or upper stems; shortly petioled, petioles 2-15 mm long; leaf blades ovate or broadly ovate, elliptic-ovate, lanceolate or narrowly lanceolate, 1-7 × 0.6-2.5 cm, base rounded to broadly cuneate, rarely subcordate, apex acute or acuminate, margins entire, herbaceous, abaxial surface sparsely or sometimes densely strigillose or strigose along veins, adaxial surface glabrous or sparsely strigillose, secondary vein 1 or 2 pairs, stipules broadly ovate or triangular, 2-6 × 1-4 mm, acute or acuminate at the apex, ciliate along margin, persistent. Glomerules often bisexual, 2.5-5.0 mm in diameter, bisexual ones in nodes of proximal leaves, female in distal axils; bracts triangular, 2-3 mm long, ciliate. Flowers greenish-white, bracteoles lanceolate, scarious. Male flowers: shortly pedicellate, pedicels c 2 mm long, perianth 4-lobed, narrowly oblong or oblong-ob lanceolate, connate to middle, 1.2-1.5 mm long, puberulent, apex acute or cuspidate, gibbous, stamens 4, filaments c 2 mm long, pistillode minute. Female flowers: sessile, perianth tube ellipsoid or rhombic, 0.8-1.0 mm, 1.5-1.8 mm long in fruit, puberulent, inconspicuously 9-ribbed or 4-winged, apex 2-toothed, styles short, c. 1 mm long, thinly pubescent, stigmas caducous. Fruit an ovoid or elliptic achene, 1.0-1.2 mm long, white, light to dark yellow or light brown, shining, enclosed by a thickened perianth. 2n = 26 (Kumar and Subramaniam, 1986). *Fl. & fr.*: 6-11. *Damp open forests, thickets by streams, wet places, arable lands, grasslands and disturbed habitats.*

Bandarban: Ruma Bazar, 28 x 1984, *M.S. Khan*, K-6748 (DACB 6214). **Bogura:** Mohastangarh, 5 ii 2003, *B.M.R. Khatun & H. Ara*, RK-4160 (DACB 30964). **Chattogram:** Hazarikhil, 15 iii 1964, *B. Basak*, 62 (DUSH); Rangapani, 6 vi 1969, *S.*

Das, 135 (DUSH); Manikchori, 7 vi 1969, *Moiz*, 206 (DUSH); Karerhat Forest Range, Moratela, 5 x 1970, *M.S. Khan & A.M. Huq*, K-1966 (DACB 6186); St. Martins Island, 2 ii 1975, *M.S. Khan*, K-4063 (DACB 6190); Sholoshahar, 23 x 1978, *Massir et al.*, 01 (BFRI); Satkania, Shualakhmuka, 8 vii 1987, *Khan et al.*, 7696 (DACB 27229); Hazarikhil Wild life Sanctuary, Kalapani, 20 viii 2014, *S.N. Uddin*, N-5504, (DACB 42493). **Chuadanga**: Darshana Halt, 13 xii 1988, *A.M. Huq et al.*, H-8927 (DACB 6199). **Cumilla**: Coatbari, 7 vi 1968, *R. Roy*, 124 (DUSH); Lalmai, Shalban Bihar, 7 viii 1988, *M. Rahman & A.M. Huq*, MZ-190 (DACB 6213). **Cox's Bazar**: Teknaf near Forest Banglow, 27 x 1963, *M.S. Khan*, K-628 (DUSH). **Dhaka**: Sadarghat, 9 v 1968, *D.R. Akhtary*, 204 (DUSH); Sadarghat, 10 iv 1940, *Atul*, (DUSH); Dhaka Hall Lawn, 29 xi 1964, *A. Malek*, 22 (DUSH); Shahbag, 22 ix 1942, *Atul*, (DUSH); Dhaka University Botanic Garden, 11 x 1968, *Panna*, 35 (DUSH); 15 vi 1988, *M.M. Rahman*, 104 (DUSH); Armanitola, 25 vii 1963, *K. Banu*, (DUSH); Dhanmondi, 12 iii 1995, *Sarmin Sabnam*, 12 (DUSH); Jinjira, 14 vi 1970, *A.M. Huq*, 31 (DACB 6192); Dhaka-Manikgonj Road, 12 xi 1975, *A.M. Huq et al.*, H-1477 (DACB 6202); Mirpur, 20 ix 1975, *A.M. Huq*, H-1428 (DACB 6195); Nabinagar, Savar, 4 vi 1999, *B.M.R. Khatun*, RK-1844, (DACB29931); Farmgate, BARC Complex, 1 ix 1999, *B.M.R. Khatun*, RK-1919 (DACB31171); Savar, Nabinagar, 4 vi 2009, *B.M.R. Khatun*, RK-1844 (DACB 29932); Mirpur, Diabari (near Beribandh), 31 iii 2013, *S.S. Shetu* 649 (JUH); Mirpur-10, Mosjidul Momen Campus, 4 i 2014, *E.H. Khokon*, EHK-85 (DACB 39419); Mirpur-1, Bangladesh National Herbarium Campus, 9 ii 2014, *E.H. Khokon*, EHK-106 (DACB 39754). **Dinajpur**: Ruhea, 13 x 1980, *A.M. Huq et al.*, H-4821 (DACB 6211); Buchagonj Thana, Horipurhat, 26 viii 1998, *M.K. Mia et al.*, M-4305, (DACB 28612). **Faridpur**: Rajbari, 15 v 1974, *M.G. Mostofa*, 2 (DUSH); Near Goalandghat, 1 vii 1973, *A.M. Huq*, H-1026 (DACB 6184); Goaland 16 vi 1981, *M.K. Mia et al.*, M-546 (DACB 6210); **Joypurhat**: Khanjanpur, 23 viii 1989, *M.K. Mia et al.*, M-2218 (DACB 6198). **Khagrachhari**: Panchari, Gomoti, 23 iv 2011, *S.N. Uddin*, N-4594 (DACB 39962). **Kishoregonj**: Poolghat, Saat Kahon, 14 iii 1988, *M.K. Mia and M. Rahman*, M-1678 (DACB 6215). **Khulna**: Kalia, 15 v 1974, *M.A. Hossain*, 1 (DUSH); Jatrapur, 16 vi 1982, *A.M. Huq*, H-5539 (DACB 6206). **Kushtia**: Alamdanga, 10 vi 1974, *M.S. Khan and A.M. Huq*, K-3896. **Manikgonj**: Manikgonj, 9 vi 1981, *A.M. Huq and M.K. Mia*, H-5172 (DACB 6207). **Munshigonj**: Rampal, 28 v 1977, *A.M. Huq and M.M. Rahman*, H-3400 (DACB 6204). **Mymensingh**: Akhtaruzzaman College, 16 iv 1973, *M. Yusuf*, 60 (DUSH); Agricultural University Campus, 16 vi 1975, *A.M. Huq*, H-1246 (DACB 6180). Mymensingh Police line, 18 ix 1980, *M.K. Mia et al.*, M-329 (DACB 6191). **Natore**: Chalanbil, 10 xii 1972, *A.M. Huq*, H-535 (DACB 6181).

Nawabgonj: Jalmashmari, 2 ix 2002, *B.M.R. Rhatun*, RK-3685 (DACB 30248); Chapai-Noabgonj Kallyanpur Horticultural Centre, 5 ix 2002, *B.M.R. Khatun*, RK-3934 (DACB). **Noakhali:** Hatia-Nalchira, 17 iii 1987, *A.M. Huq & M.K. Mia*, H-8311 (DACB 6203). **Panchagarh:** Tetulia, Tirmonhat, 22 v 1998, *S.H. Rashid*, SHR-206 (DACB 28610); Artoary, Khalpara, 30 vi 1998, *M.K. Mia et al.*, M-3890 (DACB 28,614); Tetulia, Banglabandha Zero Point, 2 vii 1998, *M.K. Mia et al.*, M-4010 (DACB 28, 805). **Rajshahi:** Rajshahi University Campus, 19 xi 1988, *A.M. Huq et al.*, H-8785 (DACB 6200); Charchat, 24 x 1989, *M.K. Mia et al.*, M-2304 (DACB 7095). **Rangamati:** Kasalong river side, 26 xii 1956, *M.S. Khan*, K-251 (DUSH); Manikchari, 24 vi 1987, *A.M. Huq & M.K. Mia*, H-8382 (DACB 6208). **Rangpur:** Burihat, 17 i 1974, *M.S. Khan & A.M. Huq*, K-3748 (DACB -6185). Chillahati, 17 x 1976, *A.M. Huq et al.*, H-2730 (DACB 6193). **Sylhet:** Ambarkhana, 27 iv 1968, Gulnazar Hamid, 106 (DUSH); Salutikar, near airport area, 22 iv 1985, *A.M. Huq & M.K. Mia*, H-7091 (DACB 6212); M.C. College Campus, 22 x 1986, *A.M. Huq & M.K. Mia*, H-7942 (DACB 6209); Fenchugonj, Monipur, Maizghoun, 7 iv 1988, *M. Rahman et al.*, MZ-120 (DACB 6254). **Tangail:** Mirzapur, 2 v 1965, *M.N. Huda*, 99 (DUSH); Ghatail, Kadamtali, Garatta, 1 iii 2015, *K.K. Islam*, KKI-12 (DACB 42152).

India, South-East Asia to Australia; introduced in Africa and Central America.

Plant is diuretic and used in the treatment of stomach-ache, ulcers, cough, throat sore, gonorrhoea, syphilis and snake bite (Chopra *et al.*, 1996). Leaf juice is drunk as a galactagogue and are sometimes eaten as vegetables.

Sarcochlamys Gaudich., Bot. Voy. Bonite: t. 89. 1826.

Type species: *Sarcochlamys pulcherrima* Gaudich.

Monoecious or dioecious, evergreen shrubs or small trees, without stinging hairs. Leaves alternate, spiral, stipules deciduous, intrapetiolar, 2-cleft, leaf blades 3-veined, margin serrulate, cystoliths punctiform. Inflorescence axillary, cymose panicles, lateral branches usually few and short, unisexual. Glomerules contiguous, forming dense spikes. Male flowers: perianth lobes 5, connate at the base, imbricate, stamens 5, filaments inflexed in bud, rudimentary ovary present. Female flowers: perianth lobes 4 or 5, connate at the base, submembranous at anthesis, enlarged and fleshy in fruits, unequal, ventral lobes (1 or 2) smaller, ovate to lanceolate, connate with others at the base, dorsal

3 (or 4) lobes larger, connate at the apex, swelling to ventricose tube, staminodes absent. Ovary without styles, stigmas sessile, ring-like, with villous hairs, ovules orthotropous. Achenes ovoid to obliquely obovoid, covered but not enclosed by fleshy perianth. Seeds with a little endosperm, cotyledons ovate.

Sarcochlamys pulcherrima Gaudich., Voy. Bonite, Bot., Atlas, t. 89. 1844. Kurz, Forest Fl. Brit. Burma 2: 426. 1877 (Repr. 1974); Hook.f., Fl. Brit. India 5: 588. 1888 (Indian repr. 1954); Prain, Beng. Pl. 2: 724. 1903 (Indian reprint ed. 1963); Brandis, Indian Trees 618. 1906; Heinig, List Chittagong: 66. 1925; Kanjilal *et al.*, Fl. Assam 4: 292. 1940 (reprint 1982); J. Sinclair, Fl. Cox's Bazar, 107. 1956; Alam, Pl. Taxon. Series, Bull. 5: 114. 1988; Ullah in Ahmed *et al.*, Encycl. Fl. Fauna Bangladesh 10: 428. 2009. *Urtica pulcherrima* Roxb., Fl. Ind., ed. 1832, 3: 588. 1832. *Sphaerotylos medogensis* C.J. Chen, Acta Phytotax. Sin. 23(6): 453-454, pl. 1. 1985. **Fig. 47.**

Local names: *Brihoti*, *Jangallya shak*, *Kurrer thang*, *Maricha*.

Dioecious shrubs or small trees, 2-6 m tall. Stems tubercled, branchlets and petioles densely appressed pubescent. Leaves alternate, petiolate, petioles 1.5-7.0 cm long, stipules triangular-ovate, 8-10 mm long, connate at the base, intrapetiolar; leaf blades lanceolate to narrowly lanceolate, 12-22 × 3-7 cm, thinly leathery, base broadly cuneate or subrounded, apex acuminate or long-acuminate, margin serrulate, basal lateral veins reaching to the apex, secondary and tertiary veins reticulated and tessellate, adaxial surface dark green, subglabrous, abaxial surface greyish tomentose, appressed pubescent on veins. Inflorescences of cymose panicles, 7-9 cm long; glomerules 2-4 mm in diameter. Male flowers: subsessile, 0.7-0.9 mm in diameter, perianth sepeloid, connate, 5-partite, lobes imbricate, stamens 5, pistillode small. Female flowers: 0.3-0.5 mm diameter, perianth campanulate, constricted, 4-lobed, gibbous, accrescent in fruits, ovary oblique, stigmas small, sessile, penicellate, ovules erect. Fruit an oblique achene, 0.4-0.6 mm long, enclosed in the fleshy perianth, pericarp membranous. Seeds with hard testa and ovate cotyledons. *Fl. & fr.*: 4-9. *Evergreen rain forests, open and damp secondary forests on floodplains; between 400-1000 m altitudes.*

Bandarban: Ruma, Eden Para, 29 x 1984, *M.S. Khan et al.*, K-6775 (DACB 6109); Sualok, Amtoli, 12 iii 2001, M. Mohiuddin & S.R. Basak, 8489 (BFRI). **Chattogram:** Foy's Lake, Chittagong sadar, 15 x 1940, S.K. Sen *et al.*, 123 (DUSH); Sitakundo,

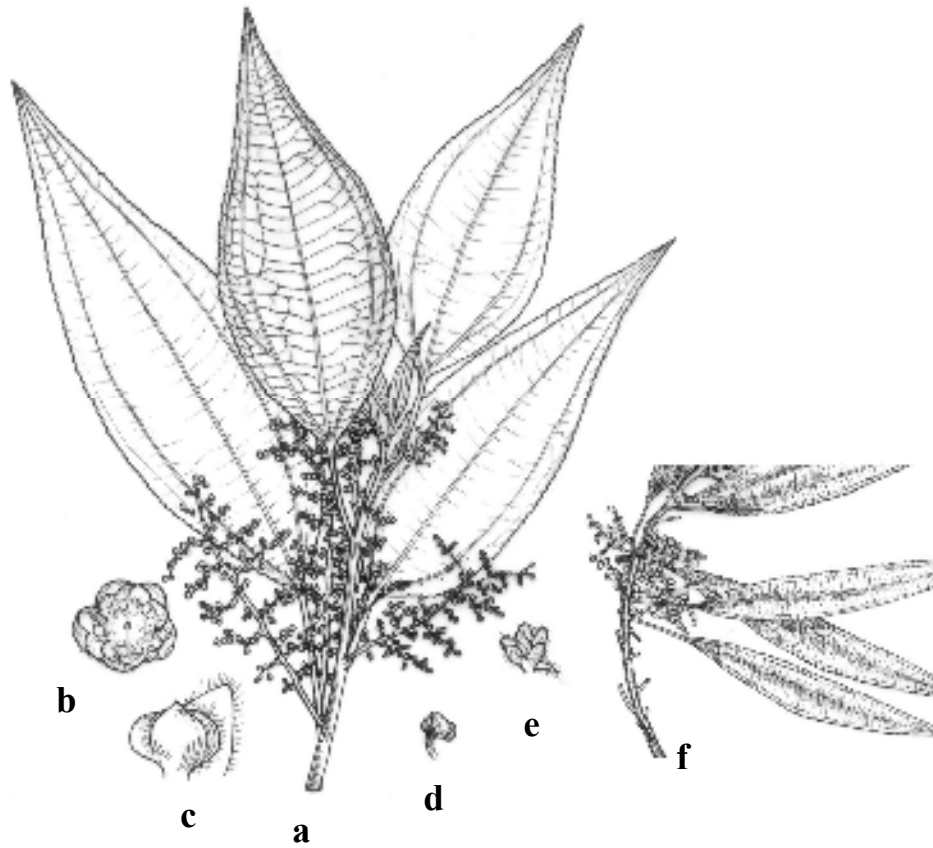


Figure 47. *Sarcochlamys pulcherrima* Gaudich.: a) Flowering shoot; b & c) Male flower; d) Stamen; e) Female flower; f) Fruiting branch.

Chandranath Hill, 22 vi 1979, *M.K. Mia & M.M. Rahman*, M-102 (DACB 6229); Sitakundo, 21 viii 1987, *M.K. Alam*, 5906 (BFRI); Foy's Lake, 29 vii 1998, *M.K. Mia et al.*, M-4093 (DACB 41916); Pablakhali Shishak forest office, 26 ix 1977, *M.S. Khan et al.*, K-4673 (DACB 6236); Kaptai, 13 vi 1983, *A.M. Huq et al.*, H-5809 (DACB 6223); Sitakundo, Chandranath Hill, 21 viii 1987, *M.S. Khan et al.*, K-7777 (DACB 6250); Betbunia, 8 viii 1989, *A.M. Huq et al.*, H-9321 (DACB 6221); Dhopachari, Paranjuran, 3 vi 1998, *M.A. Ullah et al.*, 3021 (DACB 28,953); Mirarshari, 15 vii 2012, *B. Khan et al.*, B-2870 (DACB 38,515); Sitakundo, Laliardhala, 13 ix 1996, *A.M. Huq et al.*, H-9607 (DACB 24248); Bariyadhala to Hazarikhil, 21 vi 1979, *M.K. Mia & M.M. Rahman*, M-60 (DACB 6235); Bariyadhala to Hazarikhil road, 24 x 1985, *M.S. Khan & M.K. Mia*, K-7302 (DACB 6240); Himchari, Dohazari, Lalutia, 10 vi 2001, *S.N. Uddin*, N-959 (DACB 34065). **Cumilla:** Lalmai Hills, 12 iv 1955, *Ms. Indira et al.*, 02 (DUSH); Teknaf, 28 x 1965, *M.S. Khan*, M-631 (DUSH). **Cox's Bazar:** Whykong, 9 vii 1988, *M.K. Mia et al.*, M-1995 (DACB 6220); Teknaf, 16 vi, 1991, *M.S. Khan et al.*, K-9494 (DACB 24601); Neela beat, 27 viii 1991, *M.S. Khan et al.*, K-8517 (DACB 24,693); Teknaf, Kachchopia, 24 vii 1992, *M.S. Khan et al.*, K-8729 (DACB 6234); Himchari, 17 v 2006, *B. Khan et al.*, B-39; Himchari, Bhagamura block, Barachara, 27 viii 1996, *M.A. Rahman & S.K.B. Uddin* (39186). **Khagrachari:** Dighinala, 25 vi 1985, *A.M. Huq & M.K. Mia*, H-7137 (DACB 6225). **Moulvibazar:** Adampur beat office, Kamalganj, 17 viii 1976, *M.S. Khan et al.*, K-4395 (DACB 6232); Barolekha, Madhabkundo, 21 ix 2014, *S.N. Uddin*, N-5585 (DACB 42428). **Rangamati:** Rangamati sadar, 4 vi 1969, *M.S. Khan*, 1668 (DUSH); Kaptai, 28 vi 1972, *M.A. Matin*, 90 (DUSH); Tabalchari Bazar, 4 vi 1969, *M.A.M. Chowdhury*, 83 (DUSH); Rangamati courtside, 12 vi 1969, *Alo Rani*, 200 (DUSH); Kaptai, 28 vi 1972, *M.S. Khan*, K-2588 (DACB 6238); Barkal reserved forest, 12 vi 1983, *A.M. Huq et al.*, H-5777 (DACB 6224); Rampahar, Kaptai, 27 x 1995, *M. Mohiuddin & Mezan*, 7611 (BFRI); Sitapahar, Kaptai, 25 ix 2002, *S.N. Uddin*, N-1570 (DACB 36446). **Sirajgonj:** Sirajganj, 12 xii 1974, *M.A. Kader*, 104 (DUSH). **Sylhet:** Tamabil, 24 v 1968, *Sudhangshu*, 184 (DUSH); Tamabil, 24 v 1968, *H. Hasan*, 791 (DUSH); Tamabil, 24 v 1968, *G. Hamid*, 174 (DUSH); Tamabil, 25 v 1968, *Amalendu*, 159 (DUSH); Tamabil, 23 v 1968, *Paritosh*, 153 (DUSH). **Tangail:** Madhupur, 17 x 1974, *A.M. Huq et al.*, 70 (DUSH); Madhupur forest, 17 ix 1974, *M.S. Khan & A.M. Huq*, K-3976 (DACB 6239).

India, Bhutan, Indonesia, Myanmar, Thailand and China.

Cordage is made from the bark fibre of the plant. Young shoots and fruits are eaten as vegetables.

Urtica L., Sp. Pl. 2: 983. 1753.

Type species: *Urtica dioica* Roxb.

Herbs, rarely subshrubs, annual or perennial, armed with stinging hairs. Stems often 4-angled. Leaves opposite; stipules often persistent, interpetiolar, lateral, free or connate; leaf blades 3-5(-7)-veined, margin dentate or incised-lobed; cystoliths often punctiform, sometimes short botuliform. Inflorescences in axillary pairs; glomerules forming spikes, racemes, panicles, or rarely capitula, unisexual (plants monoecious or dioecious) or androgynous. Male flowers: perianth lobes 4, imbricate; stamens 4; rudimentary ovary cuplike. Female flowers: perianth lobes 4, free or connate, enlarged in fruit, enclosing achene, strongly unequal, outer 2 (lateral) smaller than inner 2 (dorsal-ventral) lobes. Ovary straight; stigma sessile or on short style, penicillate-capitate, ovule orthotropous. Achenes straight, compressed, enclosed by persistent perianth. Seeds erect, with scanty endosperm; cotyledons suborbicular, fleshy.

Urtica dioica L., Sp. Pl. 984. 1753. **Fig. 48.**

Perennial, monoecious herbs. Stems slender, simple or branched, 25-60 cm tall, sparsely hirtellous and armed with stinging hairs; rhizomes long stoloniferous. Leaves opposite, simple; stipules greenish, interpetiolar, connate, ovate or oblong-ovate, 4-6 mm long, membranous, with several ribs, apex shallowly 2-cleft or emarginate; petiole slender, 2.5-6.0 cm long; leaf blades broadly ovate or ovate-cordate, 2.5-8.5 × 2-6 cm, base rounded or shallowly cordate, apex acuminate, margins doubly dentate, teeth increasing in size distally, membranous, 5-veined, lateral basal veins arcuate, reaching middle margin, secondary veins 2-4 each side, cystoliths botuliform or punctiform. Inflorescences unisexual; male inflorescences in distal axils, spicate, 4-7 cm long; female ones in proximal axils, subspicate, few branched, or male flowers in middle axils, female flowers in proximal and distal axils, subequal to or shorter than petioles. Male flowers: sessile or short pedicellate, in bud c. 1.3 mm; perianth lobes connate half of length, densely hirtellous, later glabrescent. Female flowers: perianth lobes connate at base, unequal, dorsal-ventral lobes suborbicular, sparsely setulose, lateral lobes broadly obovate, c. 2 times as short as dorsal ones. Achenes yellowish green, broadly ellipsoid-ovoid, slightly compressed, c. 1 mm long, smooth, covered with persistent perianth lobes. *Fl. & fr.*: 5-8. *Evergreen forests, shady and moist places of along streams, roadsides; up to 500 m altitudes.*



Figure 48. *Urtica dioica* L.: a) Flowering shoot.

East Bengal: Locality and date unknown, Griffith coll., 4508 (CAL 431766).

Bhutan, India, Nepal and China.

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