

THE RUBIACEAE IN ASSAM AND NORTH EAST FRONTIER AGENCY

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ABSTRACT

The paper presents the distribution and relative abundance of 123 taxa including 118 species belonging to 47 genera of the family Rubiaceae in Assam and North East Frontier Agency. The family is best represented in the tropical and subtropical evergreen and semievergreen forests, comparatively less abundant in deciduous forests and gressland vegetation, most poorly represented in temperate altitudes and altogether absent from subalpine and alpine situations. *Hedyotis macrophylla* Wall., *Ixora finlaysoniana* Wall. ex G. Don and *Borreria ocymoides* DC. have turned up as new records for Eastern India. Similarly, *Nauclea gageana* King and *Ophiorrhiza caudipetala* C. B. Clarke not recorded by Hooker (1880, 1881), Cooke (1904), Gamble (1921), Haines (1922), Mooney (1950) and Kanjilal *et al.* (1939) in their respective floras, have also been collected from this area. The species of economic importance have also been listed under different categories on the basis of their utility.

In pursuance of a well-planned programme of work to study the vegetation and flora of the unexplored and under-explored areas of Eastern India (cf. Rao and Panigrahi, 1959) field parties of the Eastern Circle of the Botanical Survey of India, Shillong led by Shri Rolla Seshagiri Rao (presently Regional Botanist, Western Circle, Poona) and Dr. G. Panigrahi, visited different parts of the North East Frontier Agency (N. E. F. A.) and Assam between 1956 and 1961 in different seasons. The main features of the geology, topography, climate and vegetation met with during these tours in Eastern India have been outlined in an earlier communication (cf. Rao and Panigrahi, 1961).

Amidst about 15,000 field numbers collected during these tours the ten dominant families in the area are Leguminosae, Rosaceae, Rubiaceae, Compositae, Scrophulariaceae, Acanthaceae, Labiatae, Lauraceae, Euphorbiaceae and Urticaceae.

This paper presents the distribution and relative abundance of species or genera of the family Rubiaceae in different forest types and altitudinal ranges and appends an enumeration of 47 genera and 118 species, with all available field data. This enumeration also includes the species collected earlier by Gustav Mann, Kanjilal, Das, Dey, Bor, Deka, Sharma and others between 1913 and 1956 but which were not described or listed in the Flora of Assam vol. 3, 1939. Reference to the localities in Assam and NEFA as listed in respect of all species described in the latter work, is given against some of the species enumerated. This would show that 33 species not included in the Flora of Assam vol. 3, are also available in the Regional Herbarium, Shillong.

Of the 91 genera and 609 species of the family Rubiaceae recorded by Hooker in the Flora of British India vol. 3, 1880, 1881, it appears that 23 genera and 240 species are non-Indian and 14 genera and 187 species, not Eastern Indian in distribution. Therefore, the present enumeration dealing with 47 genera and 118 species may be

treated as a significant sample of the family Rubiaceae occurring in Assam and NEFA.

ENUMERATION

Adenosacme listeri King ex Burkill in Rec. bot. Surv. India 10:298, 1925.

Shrub, growing amidst grasses; flowers pale green; fruiting September. Subansiri F. D.—9th mile from Kimin (250 m.) *Panigrahi* 19395. Common.

A. longifolia Wall. ex Kurz; F. B. I. 3:95.

Shrub up to 3 m. high, on moist soil slopes; leaves generally with whitish straight hairs or glabrous; inflorescence branched; young buds pale creamy; flowers yellow (March); young fruits green, ripe fruits pulpy, white (September–November). Khasi and Jaintia Hills—Umtru, *Panigrahi* 4392; Lakhimpur—Lekhapani, *Panigrahi* 18977; Kamrup—Garbhanga R. F., *Panigrahi* 9589; Subansiri F. D.—Kimin, *Panigrahi* 11474; Lohit F. D.—Dreyi (1200 m.), *Rolla* 10493; Badaru (400 m.), *Rolla* 10320; Tirap F. D.—Pangsupass (666 m.) *Murthy* 12999; Rusa, *Panigrahi* 17034. Abundant. *Flora of Assam*: Naga Hills, Lushai Hills, Nowgong, Khasi Hills, ascending up to 1500 m.

Anotis calycina Hook. f.; F. B. I. 3: 73.

Small annual slender herb up to 15 cm. high; leaves small, ovate-lanceolate; flowers bluish white; fruits bilobed, with persistent calyx (September). Khasi and Jaintia Hills—Shillong, *Panigrahi* 3261; Sharma 20051; (without locality), *Gustav Mann* 408. Common.

A. ingrata Hook. f.; F. B. I. 3:71.

Annual weak-stemmed herb up to 0.5 m. high; hairs all over the surface; sepals pale green; flowers white (September–October). Tirap F. D.—Rusa, *Panigrahi* 16964; Chenglang, *Rolla* 20265. Common. *Flora of Assam*: Khasi hills, ascending up to 1800 m.

A. oxyphylla (G. Don) Hook. f.; F. B. I. 3: 72.

Annual erect herb 0.5 m. high, on swampy soil; roots whitish and fibrous; flowers white with

pinkish tinge (June—September); fruiting November. Khasi and Jaintia Hills—Shillong, *Panigrahi* 3795; Upper Shillong, *Panigrahi* 3739; Mairang, *Panigrahi* 16292. Common. *Flora of Assam*: Khasi Hills up to 1800 m.

A. wightiana Hook. f.; F. B. I. 3: 75.

Erect or prostrate annual herb up to 60 cm. tall, with diffused branches radiating from rootstock, growing in wet ground; stems angular, hairy; leaves thick, hairy, nerves raised beneath; flowers in axillary spikes, small, white (February—November); fruiting August—November. Khasi and Jaintia Hills—Shillong, *Panigrahi* 2874; Umsaw, *Deka* 9153; Nongstoin, *Panigrahi* 16573; Burnihat, *Panigrahi* 4333; Upper Shillong, *Deka* 14031; Kynshi, *Panigrahi* 16332; Raliang, *Rolla* 2552; Pynursla, *Panigrahi* 2975; Lakhimpur—Dulong R. F., *Panigrahi* 11320; Darrang-Dharikati, *Panigrahi* 5697; Subansiri F. D.—Ziro, *Panigrahi* 19803. Abundant. *Flora of Assam*: Khasi Hills.

Anthocephalus cadamba (Roxb.) Miq.; F. B. I. 3: 23.

Tree about 13 m. tall; flowers in globose heads, greenish brown (July—September). Lakhimpur—Khatangapani R. F., *Panigrahi* 18908; Tirap F. D.—Rusa, *Panigrahi* 17019. Common. *Flora of Assam*: Common throughout Assam.

Argostemma verticillatum Wall.; F. B. I. 3: 43.

A small succulent herb up to 15 cm. tall, on rocks; flowers in umbels, white (July—September); fruits green (September). Khasi and Jaintia Hills—Mawmluh, *Panigrahi* 3543; Norpuh R. F., *Deka* 10108. Common. *Flora of Assam*: Khasi Hills—Umsaw up to 1200 m.

Borreria articularis (Linn. f.) F. N. Will. *Spermacoce hispida* Linn.; F. B. I. 3: 200.

Annual semiprostrate diffuse herb with rosette of branches, rooting in sandy soil; stems glandular hairy, quadrangular; flowers axillary, white to bluish white (June—December). Lakhimpur—Upper Dihing R. F., *Panigrahi* 18722; Sibsagar—Baguri, *Panigrahi* 9346. Common.

B. ocymoides DC. *Spermacoce ocymoides* Burm. f.; F. B. I. 3: 200.

Hispid herb with slender branches, growing on sandy soil; flowers in heads, sessile, minute, white (April—August). Khasi and Jaintia Hills—Umsaw, *Deka* 21646; Sibsagar—Taklai, *Wight* 18709; Lakhimpur—Upper Dihing R. F., *Panigrahi* 18700; Subansiri F. D.—Kimin, *Panigrahi* 19332; Tirap F. D.—Chenglang, *Panigrahi* 14409. Abundant.

B. stricta (Linn. f.) Schum. *Spermacoce stricta* Linn. f.; F. B. I. 3: 200.

Herb up to 60 cm. tall, growing on sandy soil; inflorescence axillary and compact; flowers white (October). Khasi and Jaintia Hills—Garampani, *Panigrahi* 4257; Jowai, *Deka* 17109; *Kanjilal* 8661;

Pangtung, *Deka* 15291; Kameng F. D.—Saleri camp, *Rolla* 1475. Abundant.

Canthium dicoccum (Gaertn.) Merr. var. **umbellatum** (Gamble) Sant. et. Merchant. *C. umbellatum* Wight; F. B. I. 3: 132. *Plectronia didyma* Kurz var. *umbellata* Gamble; Fl. Pres. Madras 624, 1921.

An evergreen shrub up to 5 m. tall; leaves glossy green; inflorescence axillary; fruits with a scar on the top, light green when young, black when mature (May—June). Darrang—Dharikati, *Panigrahi* 5615. Common. *Flora of Assam*: North Cachar Hills, Khasi Hills, Sylhet.

C. gracilipes Kurz; F. B. I. 3: 134.

An armed bushy shrub with brittle branches, growing in the crevices of rocks and boulders; flowers creamy yellow (May—December); ripe fruits pulpy, blue, with a cup-shaped scar (December—March). Khasi and Jaintia Hills—Cherrapunjee, *Panigrahi* 4846; Kamrup—Jarasal R. F., *Panigrahi* 9508; Sibsagar—Baguri, *Panigrahi* 9274. Common. *Flora of Assam*: Garampani, Barapathar, Sibsagar.

Carlemannia griffithii Benth.; F. B. I. 3: 85.

An undershrub up to 2 m. tall, growing on road sides and at the edge of forest; stems with swollen nodes and brown patches, pinkish; inflorescence an helicoid cyme; flowers creamy white, small; young fruits green, mature fruits white, dehiscent into four valves; ovary with persistent style (September—November). Kameng F. D.—Aka Hills, *Bor* 18513; Sissini, *Panigrahi* 6106; Brukpalanchen, *Panigrahi* 15641; Subansiri F. D.—Khuni Pahad (290 m.), *Panigrahi* 19334; Siang F. D.—Tuting (666 m.), *Rolla* 17420; Pangu (600 m.), *Rolla* 17699; Tirap F. D.—Rusa, *Panigrahi* 17000; Khonsa, *Panigrahi* 14534; Kheti, *Panigrahi* 14582; Pangsupass (1233 m.), *Rolla* 20067. Abundant.

Flowers and Fruits: Feb.—April.

C. tetragona Hook. f.; F. B. I. 3: 85.

Shrub, growing on moist soil; branches slightly pubescent; leaves glabrous or pubescent; flowers white (October); young fruits green (November). Kameng F. D.—Sissini, *Rolla* 1226; Lohit F. D.—Paya (400 m.), *Rolla* 10865; Badaru, *Rolla* 10290; Sonogodam (850 m.), *Rolla* 10269. Common.

Cephalanthus naucleoides DC.; F. B. I. 3: 24.

Shrub up to 3 m. tall, growing near the edge of forest next to paddy fields; flowers in heads, white, brown when dry; fruiting May. Kamrup—Kulsi R. F., *Panigrahi* 9549. Common.

C. curviflora (Wall.) Thw. var. **longifolia** (Dalz.) Hook. f.; F. B. I. 3: 177.

Undershrub, glabrous; leaves long, lanceolate, acuminate, about 28.5 × 2 cm., entire; flowers in terminal, short, branched cymes (June). Cachar—Bhubankhal, *De* 21644. Scarce.

Chasalia ophioxylodes (Wall.) Craib. [= *Chasalia curviflora* (Wall.) Thw.; F. B. I. 3: 176].

Small shrub up to 2 m. tall, growing in swampy soil under the canopy of trees; internodes bright violet or rosy violet; flower buds deep pink; flowers reddish purple (April–May); ripe fruits black (August–September). Khasi and Jaintia Hills—Pynursla, *Panigrahi* 3049; Nongpoh, *Deka* 17191; Kamrup—Carbhanga, *Panigrahi* 9566; Sibsagar—Garampani, *Panigrahi* 9422; Darrang—Chardwar, *Panigrahi* 5456; Nunai, *Nath* 13341; Kameng F.D.—Brukpalanchen, *Panigrahi* 15661; Lohit F. D.—Sonogodam (850 m.), *Rolla* 10416. Abundant. *Flora of Assam*: Sibsagar, Goalpara, Nowgong, Darrang, Lakhimpur, Khasi Hills, ascending up to 1,000 m.

Cinchona calisaya Wedd. var. *ledgeriana* Howard.

Small tree up to 7 m. tall; fruits in terminal or axillary panicles, dark green (March). Khasi & Jaintia Hills—Umsaw, *Deka* 11030; *Panigrahi* 9612; *Rolla* 11005. Cultivated. *Flora of Assam*: Cultivated in Khasi and Jaintia Hills, Garo Hills and Mikir Hills.

Coffea arabica Linn.; F. B. I. 3: 153.

Shrub about 3 m. tall, growing on moist sandy soil; fruits in axillary clusters; berry with two seeds (May–November). Khasi and Jaintia Hills—Jowai, *Rolla* 2566; Pynursla, *Panigrahi* 4540. Common. *Flora of Assam*: Cultivated in Mahadeo and Dawki (Khasi Hills).

C. bengalensis Roxb.; F. B. I. 3: 153.

Shrub up to 5 m. tall, growing on moist sandy alluvial soil; flowers white, solitary but many per plant, showy (February–April); fruits green (September–December). Nowgong—Silghat, *Panigrahi* 15270; Sibsagar—Kaziranga, *Rolla* 9722; Darrang—Chardwar, *Panigrahi* 5639; Goalpara—Bank of Sarbhanga river, *Rolla* 7196; Lohit F. D.—Parasuramkund (200 m.), *Rolla* 10931. Abundant. *Flora of Assam*: Khasi Hills, Goalpara, Kamrup, Nowgong, Darrang, Sibsagar and Lakhimpur.

C. khasiana Hook. f.; F. B. I. 3: 154.

Shrub up to 2.5 m. tall; flower buds green (March); fruits pulpy, orange-red, with two seeds, seeds plano-convex (March–October). Khasi and Jaintia Hills—Jowai, *Panigrahi* 4107; Mawsmi, *Panigrahi* 21350; Shillong, *Panigrahi* 11144. Abundant. *Flora of Assam*: Khasi and Jaintia Hills, Manipur and Goalpara.

Damnacanthus indicus Gaertn. f.; F. B. I. 3: 158.

A much branched shrub with straight slender thorns; stems and leaves pubescent. Siang F. D.—Takepokong, *Rolla* 17851. Scarce. *Flora of Assam*: Mishmi Hills and Khasi Hills (altitude 2,000 m.).

Exallage auricularia (Linn.) Bremek. *Hedyotis auricularia* Linn.; F. B. I. 3: 58.

Annual herb about 1 m. tall; stems and branches terete, pubescent; leaves sessile or petioled, broad; flowers whitish (July); young fruits brownish green

(July). Khasi and Jaintia Hills—Jowai, *Deka* 10087; Mawsmi, *Deka* (without field no.); Lakhimpur—Digboi, *Panigrahi* 19017; Upper Dihing R. F., *Panigrahi* 18886. Common.

Galium aparine Linn.; F. B. I. 3: 205.

Small herb; stems quadrangular, sticky pubescent; leaves eight in a whorl, pubescent; fruits green (May). Kameng F. D.—Nyukmadong 2966 m.), *Rolla* 7615. Common.

G. mollugo Linn.; F. B. I. 3: 207.

A suberect weak annual herb, on moss covered soil; stems quadrangular, scabrid or smooth, pinkish; leaves six in a whorl; flowers very small, white (May–October). Khasi and Jaintia Hills—Shillong, *Panigrahi* 3345; Kameng F. D.—Rupa, *Rolla* 1216; Saleri Camp, *Rolla* 1377. Abundant. *Flora of Assam*: Khasi Hills.

G. rotundifolium Linn.; F. B. I. 3: 204.

A slender soft annual herb up to 1 m. high, sometimes forming diffuse cluster and trailing through undergrowths; stems somewhat ribbed, hairy; leaves four in whorls, hairy; flowers white (August–September). Khasi and Jaintia Hills—Shillong, *Panigrahi* 2873; Laitlyngkot, *Panigrahi* 3140; Cherapunjee, *Panigrahi* 3464; Kynshi, *Panigrahi* 16331; Subansiri F. D.—Ziro, *Panigrahi* 19781. Common. *Flora of Assam*: Khasi Hills.

G. rotundifolium Linn. var. *javanicum* (Bl.) Hook. f.; F. B. I. 3: 205.

A creeping hispid annual herb; flowers brownish yellow (August); fruits usually bilobed, velvety brown (September–October). Khasi and Jaintia Hills—Shillong, *Panigrahi* 3323; *Deka* 14047; *Sharma* 13439. Common.

G. triflorum Michx.; F. B. I. 3: 205.

A weak small annual herb up to 0.5 m. high, growing on moist soil covered rocks; leaves six in a whorl at each node; flower buds slightly pinkish; flowers small, white (May–September). Kameng F. D.—Rupa (2266 m.), *Rolla* 7308; Zhung (3166 m.), *Rolla* 7985; Kalaktang, *Panigrahi* 15891. Common.

Gardenia jasminoides Ellis, Phil. Trans. li II (1761) 935.

Unarmed shrub; flowers white, fragrant (May–June). Khasi and Jaintia Hills—Shillong, *Deka* 10526. Cultivated.

Hedyotis glabra Br. ex Miq.; F. B. I. 3: 59.

Trailing herb; joints of stems swollen, stems glabrous; leaves petioled; flowers small (December), in compound axillary cymes. Khasi and Jaintia Hills—Thleu Syrryngam, *Kanjilal* 6319. Scarce.

H. hispida Retz.; F. B. I. 3: 60.

Semiprostrate or scandent herb up to 22 cm. high, with basal horizontal branches, growing amongst grasses; leaves coarse; flowers axillary,

small, white (August-October); fruiting August. Khasi and Jaintia Hills—Pynursla, *Panigrahi* 3054; Kamrup—Jarasal R. F., *Panigrahi* 9499; Tirap F. D.—Margherita, *Rolla* 19925. Common. *Flora of Assam*: Goalpara, Khasi Hills and Upper Assam.

H. lineata Roxb.; F. B. I. 3: 59.

Annual herb up to 45 cm. tall, with perennial rootstock, growing as an undergrowth in Sal forests; stems and leaves hirsute; flowers white (May). Kamrup-Kulsi R. F., *Panigrahi* 9566; Khasi and Jaintia Hills—Nongpoh, *Sharma* 10277. Abundant.

H. macrophylla Wall.; F. B. I. 3: 54.

Annual herb about 2 m. tall, forming large patches in open ground; flowers axillary, sessile, whitish in bud (September). Lakhimpur-Dulong R. F., *Panigrahi* 11257; Tirap F. D.—Niusa (1400 m.), *Panigrahi* 16709. Common.

H. monocephala Br. ex Hook. f.; F. B. I. 3: 63.

Slender annual herb about 1 m. high, growing along the road sides; stems ribbed, quadrangular, glabrous; leaves very shortly petioled, glabrous; flowers terminal, white (February). Darrang-Chardwar, *Panigrahi* 5617; Kameng F. D.—Aka Hills, *Bor* 16604. Abundant.

H. scandens Roxb.; F. B. I. 3: 57.

Scandent climbing shrub up to 4 m. high, growing on rock or moist soil and also amongst grasses; leaves thick, coriaceous, glabrous, petioled; flowers creamy white (September-November), in trichotomous cymes; corolla lobes reflexed; style protruding; young fruits green, bluish when ripe (November-March). Khasi and Jaintia Hills—Pynursal, *Panigrahi* 2909; Cherrapunjee, *Panigrahi* 3563; Umsaw, *Deka* 18119; Lakhimpur-Ranga R. F., *Panigrahi* 11434; Kameng F. D.—Sissini, *Panigrahi* 6161; Brukpalanchen, *Panigrahi* 15653; Tirap F. D.—Rusa, *Panigrahi* 16959; Jairampur, *Rolla* 19943; Lohit F. D.—Badaru, *Rolla* 10236; Paya, *Rolla* 10661; Subansiri F. D.—Kimin, *Panigrahi* 11496. Abundant. *Flora of Assam*: All over province, ascending to 1500 m.

H. stipulata Br. ex Hook. f.; F. B. I. 3: 63.

Annual prostrate or diffuse herb, growing on open sunny slopes and soil covered rocks; roots arising from nodes; stems puberulous or glabrous; flowers white (August). Khasi and Jaintia Hills—Shillong Peak, *Deka* 23202; Upper Shillong, *Kanjilal* 8263; Tirap F. D.—Kheti, *Panigrahi* 14598; Raho, *Panigrahi* 16809. Common.

H. tenelliflora Bl., F. B. I. 3: 60.

Small semiprostrate or diffuse herb up to 60 cm. tall, growing amongst grasses in the wet soil; leaves linear, sessile, glabrous; flowers axillary, white (May); fruits 2-3 at each node (November-May). Khasi and Jaintia Hills—Puriang, *Deka* 5265; Umsaw, *Panigrahi* 9175. Common. *Flora of Assam*: Khasi Hills up to 12000 m.

H. uncinella Hook. & Arn., F. B. I. 3: 56.

Annual erect herb up to 0.5 m. tall; stems quadrangular, glabrous; upper leaves sessile, lower leaves very shortly petioled; inflorescence sessile at nodes; flowers bluish pink (June-September); fruiting June. Khasi and Jaintia Hills—Raliang, *Rolla* 2648; Nongkhaw, *Panigrahi* 16254; Jowai, *Deka* 17111; Shillong Peak (1800 m.), *Rolla* 2739 & *Panigrahi* 3272. Abundant. *Flora of Assam*: Khasi Hills.

H. vestita Br. ex G. Don; F. B. I. 3: 58.

Annual stout herb up to 0.5 m. high, growing under the shades of bushes; stems and leaves hairy; cymes axillary, branched or simple; flowers green (June-August). Khasi and Jaintia Hills—Nongkhaw, *Panigrahi* 16208; Tirap F. D.—Laju Hills (1700 m.), *Panigrahi* 14669. Common. *Flora of Assam*: Cachar, Khasi and Jaintia Hills and Aka Hills.

Hymenodictyon excelsum Wall.; F. B. I. 3: 35.

Tree up to 14 m. high, with spreading branches; leaves pale green, rough; fruits brown, lenticular, vertically disposed, stiff (February). Nowgong—Silghat, *Panigrahi* 5307. Common. *Flora of Assam*: Kamrup, Nowgong, North Cachar Hills, Sibsagar and Cachar.

Hymenopogon parasiticus Wall.; F. B. I. 3: 34.

A small epiphytic shrub up to 2 m. high; scale leaves pale green or white; fruits terminal, stalked, whitish, with 5 persistent sepals (July-September). Khasi and Jaintia Hills—Mawphlong (1800 m.), *Murthy* 17149; Peak Forest, *Deka* 14009. Common. *Flora of Assam*: Khasi Hills—Mairang, Shillong Peak. Serrarim up to 2,000 m.

Hyptianthera stricta Wight & Arn.; F. B. I. 3: 121.

Small tree up to 3.5 m. high, growing on slopes; stems glabrous; leaves linear, glabrous, dull green; flowers small, white (July-November); fruits ovate, sessile, green (July-November). Khasi and Jaintia Hills—Pynursla, *Panigrahi* 4661; Lawbah, *Deka* 10088; Umtru, *Raju* 19276. Abundant. *Flora of Assam*: Garo Hills, Darrang, Lushai Hills, Goalpara, Khasi Hills and Sylhet.

Ixora acuminata Roxb.; F. B. I. 3: 137.

Shrub up to 2 m. high, growing on moist sandy alluvial soil; leaves up to 36-17 cm., glabrous, petioled, coriaceous, base acute or rounded; inflorescence terminal; fruits red (July-September). Nowgong—Silghat, *Panigrahi* 5322; Sibsagar—Kaziranga, *Rolla* 9724; Lakhimpur—Upper Dihing R. F., *Panigrahi* 18740. Common. *Flora of Assam*: Goalpara and Sibsagar.

I. finlaysonian Wall. ex G. Don, Gen. Syst. 3: 572; 1834.

Shrub up to 3 m. high, growing on moist soil; leaves coriaceous, glabrous; flower buds small, sessile, deep red (April-May); fruits green to rosy red, 1-2 seeded, seeds concave (September), Darrang

—Bishmuri, *Rolla* 7151; Cachar—Katakhal R. F., *Rolla* 9081; Loharband, *Rolla* 9121; Kalti Cherra, *Kanjilal* 4888; Sibsagar—Nambor R. F., *Panigrahi* 9435; Garampani, *Deka* (without field no.); Sola R. F., *De* 18824. Common.

I. subsessilis Wall. ex G. Don; F. B. I. 3: 139.

Shrub about 1.5 m. high; leaves leathery; cymes trichotomous; flower buds whitish but pink at base; flowers white (November); corolla tube slender, up to 3.2 cm. long. Kamrup—Garbhanga R. F., *Panigrahi* 9625; Siang F. D.—Tuting, *Rolla* 17607. Common. *Flora of Assam*: Sibsagar, Cachar, Mikir Hills, Lakhimpur and Khasi and Jaintia Hills, ascending up to 1200 m.

I. undulata Roxb.; F. B. I. 3: 147.

Shrub up to 5 m. high, growing on moist sandy alluvial soil; inflorescence lax branched; flowers white (May); corolla tube slender; ripe fruits bright red (September). Sibsagar—Baguri, *Panigrahi* 9202; Kaziranga R. F., *Rolla* 9711; Kameng F. D.—Bhairabkund, *Panigrahi* 15148. Common. *Flora of Assam*: Nowgong, Goalpara, Kamrup and Khasi Hills.

I. villosa Roxb.; F. B. I. 3: 144.

Shrub up to 2.5 m. high, growing on moist sandy soil; stems pubescent; leaves glabrous above, pubescent beneath, leathery, about 27 × 10 cm.; flowers white (May), in condensed terminal heads; base of corolla tube reddish; young fruits green, globular, with minute persistent calyx (July–September). Cachar—Katakhal R. F., *Rolla* 9058; Sibsagar—Baguri, *Panigrahi* 9201; Lakhimpur—Upper Dihing R. F., *Panigrahi* 18814. Common. *Flora of Assam*: Khasi Hills, Golaghat (Sibsagar), Cachar and Kohima Road.

Knoxia corymbosa Willd.; F. B. I. 3: 128.

An annual erect herb up to 1.5 m. tall, growing in moist places and in sandy soil cover of rock boulders; stems and leaves thinly pubescent; flowers white (July–September). Darrang—Orang R. F., *Panigrahi* 14291; Subansiri F. D.—Pete-pool, *Panigrahi* 19731. Common. *Flora of Assam*: Khasi Hills, ascending up to 1200 m.

Lasianthus biermanni King ex Hook. f.; F. B. I. 3: 190.

Shrub with scandent horizontal branches, about 3 m. high, growing under the shades of trees; leaves black when dry; flowers slightly pedicelled or sessile, pinkish white (November–April). Kameng F. D.—Sissini (2300 m.), *Panigrahi* 6263; Perila (2788 m.), *Panigrahi* 7008. Common. *Flora of Assam*: Khasi Hills up to 2,000 m.

L. hookeri Clarke ex Hook. f.; F. B. I. 3: 184.

Shrub about 2.5 m. high; stems slightly pubescent; fruits pulpy, blue, with few seeds (October). Khasi and Jaintia Hills—Jowai, *Panigrahi* 9138. Common. *Flora of Assam*: Khasi and Jaintia Hills, ascending up to 1200 m.

L. lancifolius Hook. f.; F. B. I. 3: 187.

Shrub up to 2.6 m. high; branches terete; leaves narrowly lanceolate, with long acumen, margins sometimes slightly wavy; fruits green (July). Khasi and Jaintia Hills—Norpuh R. F., *Deka* 10111. Abundant. *Flora of Assam*: Khasi and Jaintia Hills.

L. lucidus Bl.; F. B. I. 3: 184.

Shrub up to 2 m. high; leaves pale green when dry, glabrous, nerves distinct beneath; flowers white (December–January), sessile; corolla tubular, lobes small, spreading and hairy. Khasi and Jaintia Hills—Jowai, *Deka* 5022; Shillong, *Panigrahi* 4987. Common. *Flora of Assam*: Darrang, Lakhimpur, Sibsagar, Khasi Hills, ascending up to 2,000 m.

L. longicauda Hook. f.; F. B. I. 3: 190.

Shrub about 3.5 m. high; branches terete; leaves oily green but black above when dry; ripe fruits blue violet (September). Subansiri F. D.—Hapoli, *Panigrahi* 19813; Ziro, *Panigrahi* 19817. Common. *Flora of Assam*: Mishmi Hills and Khasi Hills up to 1500 m.—2,000 m.

L. sikkimensis Hook. f.; F. B. I. 3: 180.

Shrub up to 3 m. high; branches tomentose; leaves tomentose beneath, glabrous above, nerves prominent underneath; flowers creamy to pinkish white (November); fruits oval, blue, with 4 seeds (May). Khasi and Jaintia Hills—Raliang, *Rolla* 2623; Lakhimpur—Dulong R. F., *Panigrahi* 11261. Common. *Flora of Assam*: Khasi and Jaintia Hills and Digboi (Lakhimpur).

L. tubiferus Hook. f.; F. B. I. 3: 183.

Shrub up to 3 m. high; branches black or brown when dry, glabrous; leaves glossy green, nerves prominent below, slightly pubescent; flowers white, sessile (December); fruits axillary, green when young but greenish brown when ripe (September–December). Khasi and Jaintia Hills—Mawsmi, *Panigrahi* 3613; Cherrapunjee, *Panigrahi* 4845. Abundant. *Flora of Assam*: Sylhet.

L. wallichii Wight; F. B. I. 3: 180.

Small shrub about 2.5 m. high, growing on moist soil; stems, branches and leaves hirsute with chocolate coloured hairs; flowers creamy white, fruits small, globular, green (September–November). Lakhimpur—Dulong R. F., *Panigrahi* 11249; Cachar—Katakhal R. F., *Rolla* 9082. Common. *Flora of Assam*: Sylhet and Assam.

Leptodermis griffithii Hook. f.; F. B. I. 3: 198.

A rigid bushy shrub up to 1 m. high, growing on dry slopes or in rock crevices; young parts of shoots and upper surface of leaves pubescent; flowers dull violet outside, white inside (May–September). Khasi and Jaintia Hills—Upper Shillong, *Panigrahi* 3388; Kameng F. D.—Dirang-Dzong (2,000 m.), *Rolla* 7466; Jegaon, *Panigrahi*

16017. Common. *Flora of Assam*: Manipur, Khasi Hills up to 1500 m.

L. lanceolata Wall.; F. B. I. 3: 198.

An erect shrub; branches terete, glabrous; leaves hairy; flowers light violet outside, white inside (October). Kameng F. D.—Rupa, *Rolla* 1304; Aka Hills, Bor 19127. Scarce.

Luculia pinceana Hook. f.; F. B. I. 3: 37.

Large shrub or small tree up to 7 m. high, with spreading branches, growing on dry slopes of rock or sandy soil; flowers pinkish white to rosy, sweet scented (August–October); corolla tube about 5.5 cm. long; filaments fused with corolla tube; fruits green, obovate, dry ones brownish black and dehiscent into two valves (May–November). Khasi and Jaintia Hills—Pynursla, *Panigrahi* 3096; Cherrapunjee, *Panigrahi* 3426; Kameng F. D.—Rupa, *Rolla* 1336; Dirang Dzong (1829 m.), *Rolla* 7440; Jegaon, *Panigrahi* 16024; Siang F. D.—Minguiing (1900 m.), *Rolla* 17788; Lohit F. D.—Dreyi (1200 m.), *Rolla* 10485; Sonogodam, *Rolla* 10375. Abundant. *Flora of Assam*: Khasi Hills and Mishmi Hills.

Meyna spinosa (Hook. f.) Robyns

Vangueria spinosa Hook. f.; F. B. I. 3: 136.

An armed shrub or small tree up to 10 m. high; leaves pale green; flowers yellowish green (May); young fruits green, ripe fruits sweet and edible (February–July). Khasi and Jaintia Hills—Khliehriat, *Rolla* 2553; Darrang—Orang R. F., *Panigrahi* 14322; Kameng F. D.—Bhairabkund, *Panigrahi* 15155; Baha, *Panigrahi* 15298. Common. *Flora of Assam*: Garo Hills, Sibsagar, Khasi and Jaintia Hills, Kamrup, Cachar, Darrang, Goalpara and N. E. F. A.

Morinda angustifolia Roxb.; F. B. I. 3: 156.

Shrub up to 5 m. tall; stems winged; flowers terminal, white (March–April); fruits in clusters, sessile, ripe fruits bluish (May–July); roots used in dyeing. Khasi and Jaintia Hills—Nongpoh, *Rolla* 11045; Umsaw, *Panigrahi* 18173; Kamrup—Jarasal R. F., *Panigrahi* 9532; Sibsagar–Jeypore, *Panigrahi* 21965; Baguri, *Panigrahi* 9205; Darrang—Orang R. F., *Panigrahi* 14245; Goalpara—Chirang R. F., *Rolla* 7101. Abundant. *Flora of Assam*: Kamrup, Goalpara, Garo Hills, Sibsagar, Lakhimpur, Darrang, Sylhet and Khasi and Jaintia Hills, ascending up to 1200 m.

M. umbellata Linn.; F. B. I. 3: 157.

Shrub or small tree up to 3 m. tall, growing on moist soil; leaves coarse above and woolly beneath; fruits orange red (September). Cachar—Katakhal R. F., *Rolla* 9120; Tirap F. D.—Bimalapur, *Panigrahi* 16913. Common. *Flora of Assam*: Khasi Hills up to 1200 m.

Mussaenda frondosa Linn.; F. B. I. 3: 89.

Shrub up to 4 m. tall, growing amongst bushes; young shoots hairy; fruits in a panicle, globular,

green, with persistent calyx (October). Tirap F. D.—Jairampur, *Rolla* 19973; Pangsupass (1200 m.), *Rolla* 20018. Common. *Flora of Assam*: Khasi Hills.

M. glabra Vahl; F. B. I. 3: 90.

Shrub about 3 m. high, growing amongst bushes or sometimes climbing on bamboo; stipules very prominent; stems generally glabrous, rarely pubescent; flower buds greenish (March–April); young fruits dark green (July–November). Lakhimpur—Upper Dihing R. F., *Panigrahi* 18802; Kameng F. D.—Sissini (1333 m.), *Panigrahi* 7033; Siang F. D.—Geling, *Rolla* 17587; Tirap F. D.—Chenglang, *Murthy* 12914; Pangsupass, *Rolla* 20030. Common. *Flora of Assam*: Lushai Hills, North Cachar Hills, Sibsagar, Cachar, Manipur, Khasi Hills, Lakhimpur and Goalpara.

M. incana Wall.; F. B. I. 3: 87.

Shrub up to 1.5 m. high, growing on moist clayey soil; stems and leaves hairy; flowers orange yellow (July); fruits green (September). Darrang—Singri, *Panigrahi* 14357; Orang R. F., *Panigrahi* 14263; Sibsagar—Mikir Foot Hills, *Rolla* 9776. Common. *Flora of Assam*: Goalpara.

M. macrophylla Wall.; F. B. I. 3: 89.

Shrub up to 3 m. high, growing on the slope of hill; stems and leaves hairy; inflorescence branched; flowers orange yellow (May); young fruits green and hairy (September). Lakhimpur—Upper Dihing R. F., *Panigrahi* 18885; Kameng F. D.—Kalaktang, *Panigrahi* 15517; Tirap F. D.—Rusa, *Panigrahi* 16998. Common. *Flora of Assam*: Sibsagar, Khasi Hills, ascending up to 1500 m.

M. roxburghii Hook. f.; F. B. I. 3: 87.

Shrub up to 5 m. high, growing on moist sandy alluvial soil; young shoots red, pubescent; inflorescence terminal; flowers orange yellow (April–September); fruits with persistent calyx, dull green, elliptic (July–November). Khasi and Jaintia Hills—Shella, *Panigrahi* 4889; Shanpung, *Deka* 5103; Cherrapunjee, *Rolla* 2700; Umsaw, *Panigrahi* 9171; Nongkhlaw, *Panigrahi* 16238; Jowai, *Rolla* 2509; Pynursla, *Panigrahi* 3010; Lakhimpur—Dulong, *Panigrahi* 11250; Upper Dihing R. F., *Panigrahi* 18718; Sibsagar—Kaziranga, *Rolla* 9715; Goalpara—Haltugaon, *Rolla* 7140; Darrang—Tangla, *Nath* 13443; Nunai, *Nath* 13248; Kameng F. D.—Amatola, *Panigrahi* 15166; Subansiri F. D.—Kimin (230 m.), *Panigrahi* 19452; Tirap F. D.—Chenglang, *Panigrahi* 14438. Very Common. *Flora of Assam*: Khasi Hills, Lakhimpur, Garo Hills, Sibsagar, North Cachar Hills, Lushai Hills, Goalpara and Darrang.

Myrconeuron nutans Wall. ex Kurz.; F. B. I. 3: 96.

Shrub up to 2 m. tall; inflorescence terminal; fruits in compact heads, young fruits green, mature fruits brownish green (August–November). Tirap F. D.—Nignu, *Panigrahi* 14813; Niusa (1441 m.), *Panigrahi* 16714; Lohit F. D.—Badaru (*Rolla* 10300,

Common. *Flora of Assam*: Cachar, Khasi Hills, Goalpara, Central Assam, N. E. F. A. and Sylhet.

Nauclea gageana King, J. Asiatic Soc. Beng. 72: 123.

Tree about 5 m. high; inflorescence globose; corolla tubular, white (November). Siang F. D.—Eyo (500 m.), *Rolla* 17972. Scarce.

N. purpurea Roxb.; F. B. I. 3: 26.

A middle sized tree; stems and leaves glabrous; leaves elliptic, large petioled; flower heads 1 to 3, on stout peduncle (June—October). Cachar—Anlygrant, *Kanjilal* 9633; Darrang—Nunai, *Purkayastha* 13450. Common.

Oldenlandia corymbosa Linn.; F. B. I. 3: 64.

A prostrate or suberect herb, about 12 cm. tall, growing on wet soil; flowers small, white (September). Khasi and Jaintia Hills—Shillong, *Panigrahi* 3257; Subansiri F. D.—Ziro, *Panigrahi* 19784. Common.

O. diffusa Roxb.; F. B. I. 3: 65.

Annual erect diffuse herb up to 20 cm. high, growing amongst grasses in sandy soil; flowers white, small (July—October). Lakhimpur—Upper Dihing R. F., *Panigrahi* 18771; Subansiri F. D.—Zorum, *Panigrahi* 19774; 6th mile from Kimin, *Panigrahi* 19422; Tirap F. D.—Khela, *Panigrahi* 14505; Soha village, *Rolla* 20372. Abundant.

O. herbacea (Linn.) Roxb. *O. heynii* Br. ex Wall.; F. B. I. 3: 65.

Annual erect herb up to 30 cm. high, growing amongst grasses; stems slender; flowers whitish pink (November). Darrang—Burigaon, *Panigrahi* 11208; Khasi and Jaintia Hills—Shangpung, *Deka* 17514. Common.

O. pumila (Linn. f.) DC. *O. crystallina* Roxb.; F. B. I. 3: 65.

Perennial herb, forming mat on the rock surface; leaves dull green, glabrous. Tirap F. D.—Raho, *Panigrahi* 16855. Scarce.

Ophiorrhiza argentea Hook. f.; F. B. I. 3: 78.

Undershrub or herb, growing on moist soil; stems soft, pubescent; leaves about 11×4 cm., glabrous above, slightly pubescent beneath; flowers white (September—January), in congested bracteated terminal cymes; bracts subulate; calyx teeth sharply deltoid, acute; corolla tube about 2 cm. $\times$ 2 mm., lobes recurved; fruits with numerous minute seeds (November—February). Lushai Hills—Aijal Road, *Rolla* 9111; Lakhimpur—Dihing R. F., *Panigrahi* 18864; Powai, *Deka* 17720; Digboi, *Deka* 22699; Khasi and Jaintia Hills—Mahadeo, *Sharma* 10135; Lunkawrt, *Kanjilal* 6190; Pynursla, *Deka* 22341; Common.

O. calcarata Hook. f.; F. B. I. 3: 84.

Undershrub up to 1 m. high, growing on wet rock; stems, leaf—nerves beneath, petioles and cymes rusty pubescent; stems slender; leaves about 11×4 cm., nerves up to 14 pairs; cymes up to 14

flowered; flowers terminal, white (December—July); corolla tubular. Khasi and Jaintia Hills—Pynursla, *Panigrahi* 4561; Jowai, *Panigrahi* 4056; Cherrapunjee, *Panigrahi* 4984; Wahlyer, *Panigrahi* 16125; Siang F. D.—Tuting, *Rolla* 17327. Abundant. *Flora of Assam*: Khasi Hills.

O. caudipetala Clarke

Herb; stems slender, soft, tomentose; leaves about 5.9×1.5 — 3.2 cm., with scattered hairs above, petioled, nerves up to 8 pairs, pubescent beneath; flowers terminal, yellow (June); corolla tubular, hairy. Naga Hills—(without locality), *Bor* 20998. Scarce.

O. fasciculata D. Don; F. B. I. 3: 83.

Shrub up to 2 m. tall, growing on moist soil slopes; stems slender; branchlets pubescent; leaves about 12×5.5 cm., nerves up to 12 pairs, pubescent beneath; fruits triangular, green, edible (March). Siang F. D.—Along, *Murthy* 13082. Common. *Flora of Assam*: Khasi Hills.

O. hispida Hook. f.; F. B. I. 3: 83.

Small hispid herb up to 30 cm. tall; stems woody below, soft above, hairy; leaves with short or long petiole, hairy; cymes terminal, dense-flowered, hairy; flower buds green (July). Khasi and Jaintia Hills—Norpuh R. F., *Deka* 10105. Common. *Flora of Assam*: Khasi and Jaintia Hills and Lakhimpur.

O. mungos Linn.; F. B. I. 3: 77.

Annual herb up to 1 m. high, growing in the humus of forest floor; stems woody below, glabrous; leaves up to 26×12 cm., glabrous, veins 14 pairs, petiole up to 6.5 cm. long, glabrous; inflorescence dichotomously branched, spreading, glabrous or slightly pubescent; flowers brownish red (August—November); fruits flat, somewhat winged, brownish green (August—January). Khasi and Jaintia Hills—Umtru, *Panigrahi* 4368; Mawryngkneng, *Deka* 5244; Lakhimpur—Dulong R. F., *Panigrahi* 11313; Lohit F. D.—Dreyi, *Rolla* 10893; Tirap F. D.—Raho, *Panigrahi* 16811. Abundant. *Flora of Assam*: Khasi Hills.

O. nutans Clarke ex Hook. f.; F. B. I. 3: 84.

Herb; stems succulent, hairy; leaves about 6.5×4 cm., with scattered hairs above, veins up to 12 pairs, pubescent beneath; flowers chocolate brown coloured (September). Tirap F. D.—Bimalapur, *Panigrahi* 16963. Common. *Flora of Assam*: Khasi Hills.

O. ochroleuca Hook. f.; F. B. I. 3: 78.

Small shrub; branchlets soft, glabrous; leaves 12×5 cm., glabrous; inflorescence umbellate, terminal; flower buds greenish yellow (March). Kameng F. D.—Kocharigaon, *Panigrahi* 5902. Common. *Flora of Assam*: Cachar, Sibsagar, Khasi Hills, ascending up to 1200 m.

O. oppositiflora Hook. f.; F. B. I. 3: 80.

Annual herb up to 1 m. tall, growing on bare rock and soil mound under shade; stems and leaves glabrous; cymes terminal, many flowered;

flowers pinkish white (March—November); calyx greenish yellow; fruits flat, chocolate brown coloured (November). Khasi and Jaintia Hills—Burnihat, *Panigrahi* 4331; Umtru, *Raju* 19273; Norpuh R. F., *Deka* 10104; Mikir Hills district—Deygrum village, *Panigrahi* 9388; Kamrup—Jarasal R. F., *Panigrahi* 9533; Sibsagar—Baguri, *Panigrahi* 9329; Darrang—Chardwar, *Panigrahi* 5473. Common. *Flora of Assam*: Khasi hills.

O. prostrata D. Don (= *O. harrisiana* Heyne ex Hook. f.; F. B. I. 3:78).

Annual herb up to 30 cm. tall, with spreading terete branches; stems woody below, tomentose; leaves glabrous, nerves beneath pubescent; cymes terminal and axillary, pubescent; flowers pinkish white (April); corolla tubular, lobes pubescent. Kameng F. D.—Chakoo (2465 m.), *Panigrahi* 6306. Common. *Flora of Assam*: Khasi and Jaintia Hills, 1500 m.

O. prostrata D. Don var. *rugosa* (Hook. f.) Panigr. et Kar comb. nov. (= *O. harrisiana* Heyne var. *rugosa* Hook. f.; F. B. I. 3:78).

A slender herb, about 20 cm. tall; branches arising from rootstock; stems tomentose; leaves up to 9.5×3.5 cm., with scattered hairs above, nerves pubescent; cymes about 8 flowered (November); corolla pubescent; fruiting May. Khasi and Jaintia Hills—Pangtung, *Deka* 16200. Scarce.

O. succirubra King ex Hook. f.; F. B. I. 3: 82.

Undershrub up to 1 m. tall, growing on moist soil slopes; stems glabrous, slender; leaves up to 12×5 cm., glabrous, elliptic-acuminate; flowers terminal, pink (March). Siang F. D.—Along, *Murthy* 13086. Common.

O. tingens Clarke ex Fischer in Kew Bull. 33, 1940.

Shrub; stems glabrous; young parts of stems and branches slightly pubescent; leaves up to 12.5×3.5 cm., purple when dry, glabrous, nerves 12 to 14 pairs, pubescent beneath; inflorescence compound cymes, terminal; flowers pedicelled, pinkish red (June). Naga Hills—(without locality), *Bor* 19818. Scarce.

O. treutleri Hook. f.; F. B. I. 3: 83.

Succulent undershrub up to 3 m. tall, growing on moist soil along road sides; stems and leaves pubescent; flowers white, small (May—September); bracts pinkish. Khasi and Jaintia Hills—Jowai, *Rolla* 2525; Shillong Peak, *Rolla* 14055; Subansiri F. D.—Khuni Pahad (216 m.), *Panigrahi* 19619; Tirap F. D.—Raho, *Panigrahi* 16851. Common. *Flora of Assam*: Khasi Hills.

Paederia foetida Linn.; F. B. I. 3: 195.

Climber on shrubs and small trees; leaves with long petioles, ovate, base rounded or cordate, nerves 6 to 7 pairs; flowers greenish pink when young (August), in axillary and terminal branched cymes, very shortly pedicelled; fruits brownish green,

pulpy, with 2 large seeds (November). Kamrup—Sonapur, *Panigrahi* 4437; Khasi and Jaintia Hills—Nongpoh, *Deka* 17192; Tirap F. D.—Laju, *Panigrahi* 14732. Common. *Flora of Assam*: North Cachar Hills, Cachar, Sylhet, Nowgong, Darrang, Kamrup, Goalpara, Garo Hills, Khasi Hills and N. E. F. A.

P. tomentosa Bl.; F. B. I. 3: 197.

A slender climber up to 5 m. tall, growing on bushes in grasslands; leaves petioled, ovate; flowers pale violet outside, deep violet inside (June—October); corolla tube hairy inside; young fruits green, ripe fruits yellow (November—February). Khasi and Jaintia Hills—Nongstoin, *Panigrahi* 16413; Nowgong—Silghat, *Panigrahi* 5335; Lakhimpur—Dulong R. F., *Panigrahi* 11334; Tirap F. D.—Waka, *Panigrahi* 14933; Pangsupass (1127 m.), *Rolla* 20014; Lohit F. D.—Badaru, *Rolla* 10226; Douliang (305 m.), *Rolla* 10671; Heyuliang, *Rolla* 10795; Nara (458 m.), *Rolla* 10690. Abundant. *Flora of Assam*: Darrang, Sibsagar, Kamrup, Goalpara, N. E. F. A. and Khasi Hills up to 2,000 m.

Pavetta crassicaulis Bremck. (= *P. indica* Linn. var. *indica*; F. B. I. 3:150).

Small tree up to 10 m. tall, glabrous; leaves up to 18.5×7.6 cm., petioled, elliptic-ovate, obtuse or acute, lateral nerves about 10 pairs; cymes terminal; flowers white (April—May), pedicelled, with long projecting style; fruits in bunches, erect, 1-seeded, young fruits green, ripe fruits blue black (November). Kamrup—Sonapur, *Panigrahi* 4441; Sibsagar—Nardwar R. F., *Panigrahi* 9448; Goalpara—Chirang R. F., *Rolla* 7126; Kameng F. D.—Amartola, *Panigrahi* 15172. Common. *Flora of Assam*: Nowgong, Goalpara, Darrang, Cachar, Garo Hills, Kamrup, Lakhimpur, North Cachar Hills and N. E. F. A.

P. indica Linn. var. *polyantha* Hook. f.; F. B. I. 3: 150.

Shrub up to 3 m. tall; leaves up to 17×5 cm., petioled, glabrous; cymes pubescent; flowers white (March—May); corolla tube about 2.5 cm. long; fruits with one grooved seed (October—November). Lakhimpur—Ranga R. F., *Panigrahi* 11453. Scarce. *Flora of Assam*: Sylhet.

P. indica Linn. var. *tomentosa* Roxb.; F. B. I. 3: 150.

Shrub up to 6 m. high; bark grey outside, greenish cream inside, split both vertically and horizontally, soft; leaves about 21.2×9.4 cm., tomentose, petioles up to 3.5 cm. long, tomentose; inflorescence axillary, tomentose, long peduncled; flowers white (May—June); fruiting December—February. Khasi and Jaintia Hills—Umsaw, *Deka* 22833; Umling, *Kanjilal* 4026; North Cachar Hills—Singkilangsoh, *Kanjilal* 6800; Kameng F. D.—Kalaktang, *Panigrahi* 15437. Common.

Polyura geminata Hook. f.; F. B. I. 3: 77.

Perennial herb up to 30 cm. high, with rooting stems, growing on moist alluvial sandy soil and in the crevices of rocks or on the boulders under the shades of trees by the side of stream, pubescent; leaves whorled or opposite, petioled; flowers white (May–September), crowded in long pinkish pedunculate axillary scorpioid cymes. Sibsagar—Kaziranga, *Rolla* 9729; Baguri, *Panigrahi* 9248; Tirap F. D.—Devimali (1067 m.), *Rolla* 20392; Niusa (1441 m.), *Panigrahi* 15031. Common. *Flora of Assam*: Khasi Hills, ascending up to 1200 m.

Psychotria adenophylla Wall.; F. B. I. 3: 164.

Shrub up to 3 m. tall; stems and leaves glabrous; inflorescence compound raceme; flowers greenish brown (February); fruits green (November). Khasi and Jaintia Hills—Pynursla, *Panigrahi* 3057. Common. *Flora of Assam*: North Cachar Hills, Khasi and Jaintia Hills, ascending up to 1200 m.

P. calocarpa Kurz; F. B. I. 3: 173.

Shrub up to 2.5 m. tall, growing on moist soil, sometimes basal portion semiprostrate; inflorescence terminal, branches slightly pubescent; young fruits green, ripe fruits red (September–November). Lakhimpur—Ranga R. F., *Panigrahi* 11451; Sibsagar—Garampani, *Panigrahi* 9443; Cachar—Katakhal, *Rolla* 9075; Siang F. D.—Minguing (1266 m.), *Rolla* 17751; Lohit F. D.—Sonogodam (850 m.), *Rolla* 10418. Abundant. *Flora of Assam*: Sibsagar, Cachar, Naga Hills, Lushai Hills, N. E. F. A. and Khasi Hills, ascending up to 1200 m.

P. denticulata Wall.; F. B. I. 3: 173.

Tree up to 6 m. high, growing on moist sandy alluvial soil and on the slope of hills; stipules leafy, about 2 cm. long; flowers greenish yellow (April–May); fruits green, globular (September–November). Lakhimpur—Upper Dihing R. F., *Panigrahi* 21978; Sibsagar—Kaziranga R. F., *Rolla* 9716; Kameng F. D.—Sissini, *Panigrahi* 7027; Bhairabkund, *Panigrahi* 15221; Kalaktang, *Panigrahi* 15440; Siang F. D.—Tuting, *Rolla* 17415. Common. *Flora of Assam*: Kamrup and Khasi Hills.

P. erratica Hook. f.; F. B. I. 3: 168.

Shrub up to 5 m. tall; leaves dull green, narrow; flower buds brownish white (March); ripe fruits black, pulpy, oblong (September–November). Khasi and Jaintia Hills—Pynursla, *Panigrahi* 4562; Mawsmi, *Panigrahi* 3627; Kameng F. D.—Road to Sissini (2300 m.), *Panigrahi* 6273. Common. *Flora of Assam*: Sibsagar, Lakhimpur, North Cachar Hills, Khasi Hills, ascending up to 1500 m.

P. fulva Ham.; F. B. I. 3: 169.

Shrub up to 2 m. tall, growing in moist shady forest; stems blackish green; leaves with raised veins beneath, dirty green; inflorescence much branched, terminal and stalked; flowers pinkish white (April–May); fruits with scar on the top,

young fruits green, orange red when ripe, seeds 2, plano-convex (November–May). Khasi and Jaintia Hills—Shillong Peak, *Rolla* 2757; Khliehriat, *Rolla* 2566; Jorain, *Deka* 5074; Mawryngkneng, *Deka* 5243; Lakhimpur—Dulong R. F., *Panigrahi* 11251; Upper Dihing R. F., *Panigrahi* 18740; Sibsagar—Baguri, *Panigrahi* 9291; Darrang—Nunai, *Nath* 13203; Foot Hills of Mikir Hills—Deygrum village, *Panigrahi* 9406; Kameng F. D.—Perila (3026 m.), *Panigrahi* 16085; Sissini, *Panigrahi* 6234. Abundant. *Flora of Assam*: Cachar, Manipur, Khasi Hills, ascending up to 1200 m.

P. ipecacuanha Stokes

Shrub up to 25 cm. tall; flowers creamy white; fruits orange brown to blue, pulpy (November). Khasi and Jaintia Hills—Umsaw, *Deka* 9152. Cultivated.

P. montana Bl.; F. B. I. 3: 174.

Shrub up to 2 m. tall; fruits with persistent calyx, green (November). Lakhimpur—Dulong R. F., *Panigrahi* 11270. Common. *Flora of Assam*: Goalpara to Sadiya, Sylhet, Sibsagar, Khasi Hills, ascending up to 750 m.

P. subintegra Wight & Arn.; F. B. I. 3: 162.

Shrub up to 1.5 m. tall; stems and leaves glabrous; fruits globose, blue when ripe (October). Khasi and Jaintia Hills—Jowai, *Panigrahi* 4108. Scarce. *Flora of Assam*: Lakhimpur.

P. symplocifolia Kurz; F. B. I. 3: 172.

Shrub up to 2.5 m. tall; cymes trichotomously branched, spreading, shortly peduncled; young fruits green, ripe fruits blue (September–November). Khasi and Jaintia Hills—Nongpoh, *Deka* 19222; Mawsmi, *Panigrahi* 3626. Common.

Randia tetrasperma Roxb.; F. B. I. 3: 109.

Bushy shrub up to 2 m. tall; leaves very small; flowers greenish yellow (May); corolla twisted. Kameng F. D.—Jegaon, *Panigrahi* 15978; 9th mile from Rahung (2133 m.), *Rolla* 7450. Common. *Flora of Assam*: Sylhet.

R. wallichii Hook. f.; F. B. I. 3: 113.

Shrub up to 6.5 m. tall; stems with rough brown bark; leaves petioled, elliptic-lanceolate, glabrous, entire, margins sometimes wavy; cymes many flowered; flowers yellow (March). Khasi and Jaintia Hills—Shillong, *Panigrahi* 11142. *Flora of Assam*: Khasi Hills, North Cachar Hills and Nowgong.

Richardsonia pilosa H. B. & K.

An annual suberect or prostrate herb up to 1 m. tall, with much diffuse branches, growing in sandy soil; stems and leaves hirsute; flowers white (May–August), fruiting August. Khasi and Jaintia Hills—Raliang, *Rolla* 2642; Shillong, *Panigrahi* 2897; Mairang, *Panigrahi* 16284; Kamrup—Kulsi R. F., *Panigrahi* 9648. Abundant. *Flora of Assam*: An American plant now wild in Shillong.

Rubia cordifolia Linn. ; F. B. I. 3: 202.

A much branched climber up to 10 m. tall, growing on hedges and also on the slope of rock ; stems smooth or with minute spines, rarely hirsute, quadrangular ; leaves generally glabrous, rarely pubescent, 5-nerved, distinctly impressed above, rarely indistinct, base cordate, sometimes rounded ; flowers brownish yellow (May–September) ; ripe fruits blue black, with pinkish red sap (December–June) ; used for dyeing clothes by the Bhutias. Khasi and Jaintia Hills—Shillong, *Panigrahi* 2883 ; Pynursla, *Panigrahi* 2937 ; Cherrapunjee, *Panigrahi* 3463 ; Kameng F. D.—Rupa, *Rolla* 1320 ; Jabrang (2016 m.), *Panigrahi* 6569 ; Thengri village (2016 m.), *Panigrahi* 6595 ; Sissini, *Panigrahi* 6100 ; Bomdi-la Tea Point (2400 m.) ; *Panigrahi* 6914 ; Perila Hills (3016 m.), *Panigrahi* 16100 ; Kalaktang, *Panigrahi* 15701 ; Jegaon, *Panigrahi* 16006 ; Subansiri F. D.—Hapoli, *Rolla* 1705 ; Petepool, *Panigrahi* 19710. Most abundant. *Flora of Assam* : Khasi Hills.

R. sikkimensis Kurz ; F. B. I. 3: 203.

A herbaceous staggler on moist soil ; stems scabrid and grooved ; leaves 4 in a whorl, sessile, 5-nerved, distinct, base rounded ; flowers dull yellow or creamy white with greenish tinge (November) ; Mishmis use this plant for dyeing their woollen clothes. Lohit F. D.—Sonogodam, *Rolla* 10761. Common. *Flora of Assam* : Mishmi Hills.

Serissa fetida Lam.

Shrub up to 1 m. tall ; leaves small, crowded, subsessile or sessile ; flowers white and pink (August) ; corolla tube short. Khasi and Jaintia Hills—Mawsmi, *Sharma* 17169 ; Cherrapunjee, *Deka* (without field no.) ; Shillong, *Kanjilal* 9305. Cultivated.

Silvianthus bracteatus Hook. f. ; F. B. I. 3: 86.

Shrub up to 35 m. tall, growing on rock and boulders and also on moist soil ; flowers brownish pink (May–September) ; young fruits with persistent calyx, creamy white (September–November). Sibsagar—Baguri, *Panigrahi* 9306 ; Subansiri F. D.—Khuni Pahad (316 m.), *Panigrahi* 19367 ; Tirap F. D.—Rusa, *Panigrahi* 16991 ; Lohit F. D.—Paya (400 m.), *Rolla* 10866. Common. *Flora of Assam* : Cachar, Khasi Hills, Naga Hills, Manipur and Sylhet.

Spermadictyon suaveolens Roxb. (= *Hamiltonia suaveolens* Roxb. ; F. B. I. 3: 197).

Undershrub up to 3 m. tall, with spreading branches ; young parts of stems, and leaves slightly pubescent ; flowers white (October), very shortly pedicelled. Kameng F. D.—Rupa, *Rolla* 1341. Scarce.

Spiradiclis bifida Wall. ex Kurz ; F. B. I. 3: 76.

Undershrub up to 5 m. tall, growing amongst bushy plants ; stems succulent ; leaves with veins

depressed ; inflorescence in slender panicles ; flowers small, pinkish white (July–November) ; fruits pale green, dehiscent, with black seed (November). Khasi and Jaintia Hills—Norpah *Deka* 10103 ; Dawki, *Panigrahi* 4554 ; Subansiri F. D.—Khuni Pahad, *Panigrahi* 19618 ; Siang F. D.—Tuting, *Rolla* 17354 ; Garsing (666 m.), *Rolla* 17932 ; Minguing, *Rolla* 17646 ; Tirap F. D.—Chenglang, *Panigrahi* 14442. Abundant. *Flora of Assam* : Cachar, Upper Assam, Aka Hills and Khasi Hills upto 1,200 m.

S. cylindrica Hook. f. ; F. B. I. 3: 76.

Annual herb up to 1 m. tall, growing in the crevices of rock ; inflorescence an helicoid cyme ; flowers small, creamy white (September–October). Subansiri F. D.—Khuni Pahad (316 m.), *Panigrahi* 19330 ; Tirap F. D.—Chenglang, *Rolla* 20279 ; Nianu, *Panigrahi* 14987. Common. *Flora of Assam* : Khasi Hills and Mishmi Hills.

Tarema odorata Robens. *Webera odorata* Roxb. ; F. B. I. 3: 102.

Tree about 8 m. high ; leaves dull green above, black when dry ; cymes compound, pubescent ; fruits green, black when dry, globular, one seeded (September). Tirap F. D.—Banfera, *Panigrahi* 16739. Common. *Flora of Assam* : Lushai Hills, Manipur and Khasi Hills, ascending up to 1,200 m.

Uncaria pilosa Roxb. ; F. B. I. 3: 32.

A shrubby climber up to 5 m. tall, growing on soil slopes ; stems and leaves hairy ; stipules caducous ; fruits in compact heads, pale green (March–August). Khasi and Jaintia Hills—Umsaw, *Deka* 18174 ; Tirap F. D.—Kheti, *Panigrahi* 14559 ; Chenglang (600 m.), *Murthy* 12915. Common. *Flora of Assam* : Lakhimpur, Sibsagar and North Cachar.

U. sessilifructus Roxb. ; F. B. I. 3: 30.

Woody climber up to 10 m. tall ; fruits in condensed heads, globular, greenish yellow (May–November). Nowgong—on the way from Nowgong to Shillong, *Panigrahi* 9463 ; Khasi and Jaintia Hills—Umsaw, *Deka* 19219 ; Tirap F. D.—Namchik (550 m.), *Rolla* 20211. Common. *Flora of Assam* : Common throughout Assam.

U. macrophylla Wall. ; F. B. I. 3: 32.

A large woody climber up to 10 m. tall ; young inflorescence globose, green (October). Tirap F. D.—Margherita (216 m.) *Rolla* 19952. Common. *Flora of Assam* : Sibsagar, Lakhimpur and North Cachar Hills.

Wendlandia grandis Cowan in Notes Bot. Gard. Edinb. 16: 277, 1932.

Tree up to 10 m. high, with spreading branches, growing on moist soil slopes ; inflorescence racemose, showy ; flowers terminal, sessile (November–February) ; corolla lobes reflexed, white ; stamens inserted on the throat of corolla tubes, sessile. Darrang—Chardwar, *Panigrahi* 5645 ; Khasi and

Jaintia Hills—Mairang, *Panigrahi* 21984; Siang F. D.—Along, *Murthy* 13078; Tuting, *Rolla* 17409; Pangu (600 m.), *Rolla* 17697. Common. *Flora of Assam*: Throughout the Province up to 1,200 m.

W. puberula DC.; F. B. I. 3: 37.

Large shrub or small tree up to 3 m. tall; stems and branches terete; inflorescence branched; flowers small, sessile, greenish white (October). Khasi and Jaintia Hills—Jorain, *Panigrahi* 4179; Mawmai, *Deka* 18108. Common. *Flora of Assam*: Nowgong, Darrang, Goalpara, Sibsagar, North Cachar Hills and Khasi Hills.

W. wallichii Wight & Arn.; F. B. I. 3: 38.

Shrub up to 7 m. high; branches opposite; stipules deciduous; flowers terminal and also axillary in the axils of the uppermost leaves, small, creamy white, fragrant; calyx teeth small, triangular; corolla tube longer than calyx, lobes recurved; fruits greenish brown, with persistent calyx (May—August). Khasi and Jaintia Hills—Cherrapunjee, *Panigrahi* 4805; Pynursla, *Panigrahi* 4637; Dawki, *Panigrahi* 4665; Jowai, *Deka* 5189; Kameng F. D.—Baha, *Panigrahi* 15281; Kalaktang, *Panigrahi* 15439; Tirap F. D.—Laju (1650 m.), *Panigrahi* 14664. Common. *Flora of Assam*: Sibsagar, Lakhimpur and Khasi Hills up to 1,800 m.

Xeromphis spinosa (Thunb.) Keay. *Randia dumentorum* (Retz.) Poir.; F. B. I. 3: 110.

Large bushy shrub or small tree up to 8 m. high, with horizontal spines; leaf-veins prominent; flowers white (May); fruits stony, green and spher-

ical (July—November). Khasi and Jaintia Hills—Burnihat, *Panigrahi* 4513; Kamrup—Motharguri, *Rolla* 9953; Sibsagar—Baguri, *Panigrahi* 9203. Common. *Flora of Assam*: Goalpara, Nowgong, Garo Hills, Kamrup, North Cachar Hills, Khasi Hills and Darrang.

X. uliginosa (Retz.) Maheshwari syn. *Randia uliginosa* DC.; F. B. I. 3: 110.

Large bushy shrub up to 8 m. high; fruits spherical, green (July—August). Darrang—Singri, *Panigrahi* 14355; Tirap F. D.—Nignu, *Panigrahi* 14825. Common. *Flora of Assam*: Nowgong, Darrang, Garo Hills, North Cachar Hills and Goalpara.

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