

PROPERTY OF THE BOTANY DEPARTMENT

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Vol. II.]

[Part VI.

FLORA

OF

TRINIDAD AND TOBAGO

LAMIALES

MYOPORACEAE

(BY E. E. CHEESMAN)

VERBENACEAE

(BY HAROLD N. MOLDENKE)

AVICENNIACEAE

(BY HAROLD N. MOLDENKE)

LABIATAE

(BY R. E. D. BAKER)

PLANTAGINALES

PLANTAGINACEAE

(BY E. E. CHEESMAN)

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COHORT 10. LAMIALES

- Lvs. alternate 1. **Myoporaceae**
Lvs. opposite
 Style terminal; ovary entire or shortly,
 but not deeply, 4-lobed
 Embryo not viviparous; herbs, shrubs
 or trees not inhabiting lagoons 2. **Verbenaceae**
 Embryo viviparous; trees of coastal
 lagoons and swamps 3. **Avicenniaceae**
 Style gynobasic, i.e. arising from the base
 and between the lobes of a deeply
 4-lobed ovary 4. **Labiatae**

FAMILY 1. MYOPORACEAE

BY E. E. CHEESMAN

Shrubs or small *trees*. *Leaves* alternate, entire, without stipules. *Flowers* solitary or clustered in the axils, hermaphrodite, more or less irregular. *Calyx* 5-parted. *Corolla* gamopetalous, its limb oblique or 2-lipped, 5-lobed, the lobes imbricate. *Stamens* 4, borne on the corolla tube; *filaments* slender. *Ovary* usually 2-locular with 2-8 ovules in each loculus, often 4-celled by development of false septa; *style* simple, terminal; *stigma* terminal and small. *Fruit* a drupe, usually fleshy.

A family mainly Australasian and represented in the West Indies by a single monotypic genus.

1. BONTIA L.

Fls. solitary or few in the upper axils. *Cal.* segments free to the base, imbricate. *Cor.* with straight, cylindrical tube and limb rather deeply 2-lipped, the posterior lip concave, 2-fid, the anterior lip recurved and at length revolute, 3-fid, its middle lobe densely bearded. *Stam.* didynamous (2 longer than the others); *filaments* slightly thickened and hairy at the base. *Ovary* 2-celled with 4 ovules in each cell. *Drupe* fleshy, with a hard endocarp.

1. *B. daphnoides* L.

Olives

Griseb. Fl. 503: Urb. Symb. Ant. 4. 580; 8. 659: Britt. & Wils. Sci. Surv. Porto Rico 6. 221: Lanjouw in Pulle Fl. Surin. 4. 2. 256.

Shrub, or small *tree* up to 9 m. high, nearly glabrous throughout; *lvs.* oblong or oblong-lanceolate, 6-10 cm. long, 1-2 cm. wide, acute and pointleted at apex, tapered at base into a *petiole* 0.5-1.5 cm. long; *pedicels* slender, 1-2 cm. long; *cal.* of broadly ovate lobes, 3-4 mm. long, with an awl-shaped point, fringed on the margins; *cor.* about 2 cm. long (yellow, purple-blotched, *fide* Britt. & Wils.; brownish green, purple within, *fide* Lanjouw), tube hairy within, limb bearded on the middle lobe of the anterior lip; *drupe* ovoid, pointed, yellow, 1-1.5 cm. long.

Trinidad: Colombia Estate, Cedros (Crueger, 2.2.1852, in Herb. Kew); Woodbrook, planted (Broadway 6676, 11.1.1928, in Herb. Kew).

West Indies and northern S. America; perhaps always cultivated in Trinidad.

FAMILY 2. VERBENACEAE

BY HAROLD N. MOLDENKE*

Herbs, shrubs, woody vines or trees. Leaves mostly opposite, sometimes whorled, alternate or scattered, exstipulate, sessile or petiolate, simple or compound. *Infl.* axillary or terminal, in the form of cymes, racemes, spikes, panicles, thyrsi, heads, or false umbels, sometimes involucrate. *Calyx* gamosepalous, campanulate, tubular or salver-shaped, persistent, usually accrescent, usually 4-lobed. *Corolla* regular or irregular, usually with a well-developed tube, its limb 4- or 5- (rarely 7- to many-) parted, often somewhat 2-lipped. *Stamens* mostly 4 and didynamous, or reduced to 2, sometimes 4 or 5 and equal, inserted on the corolla-tube. *Carpels* 2, rarely 4 or 5; *ovary* mostly compound, sessile, mostly somewhat 4-lobed, placentas axile. *Fruit* usually a dry schizocarp or drupaceous.

Of introduced plants belonging to this family the most important is teak (*Tectona grandis* L.f.) of which plantations exist in many parts of the Colony. In gardens *Holmskioldia sanguinea* Retz., the 'Chinese hat plant', *Verbena hybrida* Voss and species of *Clerodendrum* are commonly cultivated.

Leaves palmately compound 11. **Vitex**

Leaves simple

Inflorescence racemose and centripetal
(indeterminate)

Fertile stamens two 4. **Stachytarpheta**

Fertile stamens four

Fruiting-calyx winged, its lobes
spreading; calicinal crest present..... 7. **Petrea**

Fruiting-calyx not winged, no calicinal
crest

Fruit composed of four 1-seeded
pyrenes; leaves scattered 6. **Amasonia**

Fruit not composed of four 1-seeded
pyrenes

Fruit composed of one or two
1-celled and 1-seeded pyrenes

Fruit with a fleshy exocarp 1. **Lantana**

*This account is based on the Verbenaceae and Avicenniaceae of Trinidad and Tobago, Lilloa 4, pp. 283-336, 1939, by H. N. Moldenke.

- Fruit with a thin dry exocarp
 Mostly herbaceous with trailing stems; spikes greatly elongated in fruit; bracts cuneate-obovate, not 4-ranked3. **Phyla**
- Erect shrubs; spikes not usually elongating in fruit; bracts ovate or lanceolate; often more or less 4-ranked2. **Lippia**
- Fruit composed of two or four 2-celled and 2-seeded pyrenes
 Fruiting-calyx patelliform or cupuliform, not inflated nor enclosing the fruit, nor rostrate at apex8. **Citharexylum**
- Fruiting calyx flask-shaped, completely enclosing the mature fruit, usually rostrate
 Herbaceous; fruit dry, composed of two pyrenes5. **Priva**
- Woody; fruit fleshy, composed of four pyrenes9. **Duranta**
- Inflorescence cymose and centrifugal (determinate)
 Flowers regular; stamens equal10. **Aegiphila**
 Flowers irregular; stamens didynamous12. **Clerodendrum**

1. LANTANA L.

Erect *herbs* or *shrubs*, sometimes subscentent, usually more or less rough. *Lvs.* opposite or whorled, toothed, often wrinkled. *Infl.* of dense cylindrical spikes or contracted to heads, usually axillary, pedunculate. *Fls.* red, yellow, blue, or white, often fading to other shades, sessile in the axils of solitary bractlets. *Cal.* small. *Cor.* tube cylindrical, slender, limb spreading, 4-5 parted, regular or obscurely 2-lipped. *Stam.* 4, didynamous. *Ovary* 2-celled, each cell with 1 ovule; *style* usually short; *stigma* rather thick. *Fruit* fleshy, 2-celled or splitting into two 1-celled pyrenes.

Infl. conspicuously elongated in age

Lvs. mostly in threes; *fls.* pink, lavender or purple1. *L. trifolia*

Lvs. opposite; *fls.* white or rose5. *L. radula*

Infl. capitate even in age

Bracts oblong or lanceolate, 1-1.5 mm.

wide.2. *L. camara*

Bracts ovate, 2-5 mm. wide

Lvs. 1-4 cm. long, short pubescent ...3. *L. involucrata*

Lvs. up to 11 cm. long, velvety.....4. *L. lockhartii*

1. *L. trifolia* L.

L. pilosa H.B.K.

L. indica Wall.

Camara trifolia (L.) Kuntze

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 496: Urb. Symb. Ant. 4. 531; 8. 593: Britt. & Wils. Sci. Surv. Porto Rico 6. 140: Moldenke, Lilloa 4. 287.

Suffrutescent, to 2.5 m. tall, rough-pilose, at least above; *lvs.* mostly ternate, sometimes opposite or in fours, usually membranous, oblong-lanceolate or elliptic-lanceolate, petiolate, 5-12 cm. long, acute or acuminate at the apex, crenate-serrate along the margins, attenuate at the base, often reticulate-rugose above and very scabrous or more or less strigose-pubescent, rather densely resinous-punctate and pubescent beneath with canescent or brownish hairs; *infl.* spicate, subcapitate when young, later cylindrical and elongating to 4.5 cm., densely many-flowered; *peduncles* slender, usually shorter than or equalling the leaves, 2-10.5 cm. long, rather densely strigose-pubescent, solitary in each leaf-axil; *spikes* at first sub-globose, 1-1.5 cm. diam.; *bracts* herbaceous, ovate, the lowest up to 10 mm. long and 3 mm. wide, cuspidate-acuminate at apex, 5-nerved, strigose above, loosely imbricate, the upper ones with the cusp about equalling the corolla tube; *cor.* pink, lavender or purple, its tube 5-6 mm. long; *drupes* purple or lavender, 2-3 mm. diam.

Trinidad: Monos (Britton & Mendelson 578); Britton 2908; Britton & Hazen 711; Botanic Garden (Herb. Trin. 2171, 17.10.1888); seashore near Burk's pasture (Herb. Trin. 2412, 18.10.1867); St. Clair (Herb. Trin. 3590, 12.3.1889); St. Ann's (Herb. Trin. 3837, 25.6.1889); Maraval (Herb. Trin. 5937, 1891); Piarco savanna (Herb. Trin. 6035, *ann.* 1895); Erin (Herb. Trin. 7329, 10.11.1915); St. Augustine paddy fields (Herb. Trin. 9006, 23.3.1920).

Tobago: Roxburgh-Parlatuvier rd. (Herb. Trin. 11104, 5.6.1925); Providence Main Rd. (Herb. Trin. 11799, 15.9.1927); Broadway 3540 and 4148.

Waste ground and second growth.

Widely distributed throughout tropical America from Mexico and Cuba to Argentina, Bolivia and Peru; polymorphic and variable.

2. *L. camara* L.

Wild sage, Black sage

L. mutabilis Weigel*L. mutabilis* Salisb.*L. scabrida* Ait.*L. scabrida* Soland.*L. antillana* Raf.*Camara aculeata* var. *subinermis* Kuntze

Griseb. Fl. 495: Urb. Symb. Ant. 4. 529: Britt. Fl. Berm. 314: Britt. & Millsp. Bah. Fl. 369: Britt. & Wils. Sci. Surv. Porto Rico 6. 139: Moldenke, Lilloa 4. 288.

Branching *shrub*, up to 2 m. tall, the *stems* and *branches* unarmed and rigid-pubescent or very slightly prickly; *lvs.* uniformly opposite, petiolate, chartaceous, ovate or oblong-ovate, 2-12 cm. long, acute or short-acuminate (rarely obtuse) at apex, crenate-serrate along the margins, acutely narrowed or abruptly rounded to a subcuneate acumination at the base, more or less reticulate-rugose and decidedly scabrous above, more or less densely short-pubescent beneath (usually only on the veins) with canescent or brownish hairs; *infl.* always capitate, to 2 cm. long and 3 cm. wide, densely many-flowered; *peduncles* shorter than or equalling or even surpassing the leaves, 2-8 cm. long, more or less appressed puberulent-pilose; *bracts* oblong or lanceolate, 4-7 mm. long, equal, 1-1.5 mm. wide, subulate or acute at apex (rarely a few larger ones also present, appressed strigose-pubescent, usually about half as long as the corolla tube; *cal.* very thin, about 3 mm. long; *cor.* orange-yellow or orange, changing to red or scarlet, its tube about 10 mm. long, barely enlarged above the middle, slightly curved, puberulent, its limb 6-8 mm. wide; *drupes* black, about 3 mm. in diameter.

Trinidad: Britton & Hazen 1607; Eggers s.n.; Cedros (Herb. Trin. 7285, 2.10.1915); Erin (Herb. Trin. 7364, 12.11.1915); Pointe-a-Pierre (Herb. Trin. 7835, 26.3.1915); Gasparillo (Herb. Trin. 8379, 30.12.1914); Botanic garden (Herb. Trin. 9188, 27.12.1916).

Tobago: Botanic garden (Herb. Trin. 10464, 7.10.1912).

Waste ground and second growth; an abundant and troublesome weed.

Widely distributed in tropical and subtropical America from Florida, through the West Indies, Mexico and Central America to Argentina, Bolivia and Peru; introduced and naturalized in the tropics and subtropics of the Old World; widely cultivated. Races differ in the size and shape of the leaves, the presence or absence of prickles, the amount of pubescence, and the size and colour of the flowers. The smaller-leaved plants are mostly in dry districts.

2a. *L. camara* var. *aculeata* (L.) Moldenke*L. aculeata* L.*Camara aculeata* (L.) Kuntze & var. *normalis* Kuntze

Urb. Symb. Ant. 8. 591: Britt. Fl. Berm. 315: Britt. & Wils. Sci. Surv. Porto Rico 6. 139: Moldenke, Torreya 34. 9: Moldenke, Lilloa 4. 289.

This variety differs from the typical form of the species chiefly in having its stems, branches, and branchlets usually conspicuously armed with rather stout and recurved prickles. It is said also to be more generally half-climbing in habit, rather than erect, and to have its corollas opening yellow to orange and changing to pink or rose, rather than opening orange and changing to red or scarlet.

Trinidad: Tamana rd. (Herb. Trin. 13278, 9.3.1938); Britton, Hazen & Mendelson 1773.

Tobago: Bacolet (Herb. Trin. 13200, 17.10.1937); Broadway 2972.

2b. *L. camara* var. *mista* (L.) L. H. Bailey*L. mista* L.*L. mixta* L.*L. mixta* Medic.*L. mutabilis* Lippold

Camara aculeata var. *subinermis* f. *mista* (L.) Kuntze & var. *normalis* f. *mista* Kuntze.

Bailey, Cycl. Am. Hort., 884. 1900: Moldenke, Lilloa 4. 289.

This variety differs from the typical form of the species in having its young branchlets usually densely spreading-hirsute, rather than appressed-puberulent. Its outer flowers are said to open yellowish, changing to saffron or brick-red, while its inner flowers open yellow and change to orange.

Trinidad: Monos (Herb. Trin. 2409, Feb. 1861 and 9187 (in part) Oct. 1917); St. Clair (Herb. Trin. 3586, 12.3.1889 and 9190, 4.10.1914); Botanic garden (Herb. Trin. 3698, 6.2.1890; 3835, 24.6.1889 and 8244, 13.7.1916). Also cultivated.

2c. *L. camara* var. *nivea* (Vent.) L. H. Bailey

This variety is cultivated in Trinidad. The flowers all open white, outer ones become bluish.

Botanic garden (Herb. Trin. 8243, 13.7.1916 and 9189, 27.12.1916).

Other varieties to be expected in Trinidad and Tobago are var. *crocea* (Jacq.) L. H. Bailey, in which the flowers all open sulphur yellow and become saffron; var. *sanguinea* (Medic.) L. H. Bailey, in which the flowers all open saffron-yellow and become bright red; var. *mutabilis* (Hook.) L. H. Bailey, in which the outer flowers open white and turn to yellowish and then rose or lilac and the inner flowers open yellowish; and var. *varia* (Kuntze) Moldenke, in which the outer flowers open sulphur-yellow and turn purple or violet and the inner flowers open yellow and turn orange.

3. *L. involucrata* L.

- L. odorata* L.
- L. lanuginosa* Mill.
- L. incana* Otto & Dietr.
- L. reticulata* Eggers
- L. odorata* Ait.
- L. recta* Ait.

Griseb. Fl. 496: Urb. Symb. Ant. 4. 530; 8. 592: Britt. Fl. Berm. 315: Britt. & Millsp. Bah. Fl. 370: Britt. & Wils. Sci. Surv. Porto Rico 6. 139: Moldenke, Lilloa 4. 290.

Shrub or small *tree* up to 4 m., much branched, pubescent; *branches* stiff, spreading, tetragonal or nearly terete, the bark commonly fissured; *lvs.* elliptic or ovate, varying to oblong, lanceolate, obovate or even rhomboid-subrotund, petiolate, 1-4 cm. long, 0.4-2.5 cm. wide, blunt, obtuse, or rounded at the apex, narrowed or obtuse at the base or cuneately prolonged into the petiole, uniformly crenulate with rounded appressed teeth from the apex almost to the base, reticulate-rugose and more or less scabrous above, short-pubescent beneath; *peduncles* usually surpassing the leaves, 1-5 cm. long, slender, strigose, usually canescent; heads globose, dense, several to many-flowered, conspicuously involucrate; outer *bracts* broadly ovate or ovate-lanceolate, 3-6 mm. long, 2-5 mm. wide, sericeous-strigose, acute, equalling the flowers; inner *bracts* much smaller, ovate-subrotund, subacuminate, reflexed, half as long as the flowers; *cor.* lilac, violet, or white, its throat yellowish, its tube 2-8 mm. long; *drupes* blue, about 3 mm. diam.

Trinidad: Sieber Fl. Trin. 117.

Tobago: Broadway 4260; Auchenskeoch (Herb. Trin. 9689, 28.10.1912); Sandy Point (Herb. Trin. 11818, 15.9.1927); Buccoo Point (Herb. Trin. 13495, 2.4.1940).

Widely distributed through subtropical and tropical America from Florida, Cuba and Mexico, through the West Indies and Central America, to northern South America and Peru. A polymorphic and very variable species, consisting of numerous races differing in habit, leaf size and shape, and pubescence.

4. *L. lockhartii* (Griseb.) G. Don ex Sweet*Lippia geminata* var. *lockhartii* Griseb.

Griseb. Fl. 495 in syn.: Moldenke, Lilloa 4. 291.

Shrub to 2.5 m. tall; *branches* and *branchlets* medullose, obscurely tetragonal, densely villous-pubescent or hirsute with whitish rather spreading hairs; *lvs.* petiolate, lanceolate or ovate, 2.5-11 cm. long, 1-4.7 cm. wide, acuminate at apex, rather uniformly and sharply serrate along the margins except at the base, acuminate narrowed into the petiole, varying from densely velutinous above with rather long antrorsely appressed hairs to sparsely strigose-pubescent and scabridous, densely velutinous beneath with yellowish or whitish hairs; *peduncles* mostly equalling or shorter than the leaves, 1-5.5 cm. long, slender, densely villous or hirsute with spreading canescent or yellowish hairs; heads globose or ovate, densely many-flowered, conspicuously involucrate; outer *bracts* ovate, 5-8 mm. long, 2-3 mm. wide, acute or acuminate at apex, densely sericeous with rather long appressed whitish hairs; inner *bracts* similar, but much smaller and usually reflexed; *cor.* white with a yellowish eye, its tube 4-7 mm. long.

Trinidad: Britton & Broadway 2637; Johnson 1163; Chacachacare (Herb. Trin. 431, 15.8.1847; 2406, 24.4.1866; and 11066, 27.5.1925); Monos (Herb. Trin. 7441, 27.11.1915 and 9187, Oct. 1917); Gasparillo (Herb. Trin. 8381, 30.12.1914); Gasparee (Herb. Trin. 11195, 21.9.1923, Britton 2786); Pointe Gourde (Herb. Trin. 9191, 9.9.1912 and 10460, 31.3.1921); Stauble's Bay (Herb. Trin. 13350, 22.3.1938).

Dry hillsides, Bocas Is. and N.W. Peninsula. Endemic.

5. *L. radula* Sw.

Schau. in A.DC. Prodr. 11.606; Griseb, Fl. 496; Moldenke, Lilloa 4.292.

Low *shrub*; stems often decumbent and rooting at the nodes, spreading, tetragonal, sulcate, hispid; *lvs.* opposite, ovate, sub-rhomboid, or subrotund-oval, 2.5-4 cm. long, 1.2-3 cm. wide, narrowed at the base into a short petiole, acuminate at apex, coarsely crenate, conspicuously reticulate-rugose, scabrous-hispid or hirsute above, hirsute-canescens and densely glandular-punctate beneath; *peduncles* axillary, solitary or paired, subequalling the subtending leaves, often subcorymbose at apex of branches, tetragonal; heads squarrose at first globose, later very lax and oblong-spicate, about 1.5 cm. wide; *bracts* submembranous, pale yellowish, ovate, shorter than the corolla-tube, cuspidate-acuminate, lax, reclinate, undate, substrigose-hispidulous on both surfaces, venose, lightly 5-7 nerved, glandular-punctate, the outer ones largest, broadly subrotund-ovate acute, the inner ones very

narrowly acuminate; *cal.* very small, truncate, strigose; *cor.* white or rose, subvillous-hirtellous on the outer surface, its tube slender, about 5 mm. long, slightly incurved, its limb undulate; *drupes* globose, smaller than a pea, fleshy, black, 2-seeded.

Trinidad: Sieber 168; E. Wall (s.n. 11.5.27).

This species is known from St. Vincent, St. Lucia, and perhaps Dominica in the Lesser Antilles, but most commonly from Brazil. It resembles *L. montevidensis* in habit, except for the greatly elongating heads and different-coloured corollas.

DOUBTFUL AND CULTIVATED SPECIES

Lantana canescens H.B.K. differing from *L. involucrata* in being very decidedly canescent-strigose throughout and having sharply acute lanceolate leaves, with sharp antrorse teeth is recorded from Trinidad by Urban in Symb. Ant. 8. 593 (1921).

Lantana montevidensis (Spreng.) Briq. (*L. sellowiana* Link & Otto of Britt. & Wils. Sci. Surv. Porto Rico 6. 140)—weeping Lantana, trailing Lantana or polecat-geranium—from southern S. America, differing from *L. involucrata* in its acute or acutish coarsely-toothed leaf-blades and larger magenta or lilac corollas (about 10 mm. long), is cultivated in Trinidad.

L. moritziana Otto and Dietr. has been recorded from Trinidad on the basis of a specimen collected by L. H. & E. Z. Bailey on 12th March, 1921, and described as a semi-scandent bush 10-15 ft. tall, with orange and yellow flowers. The species is much like *L. camara* var *mista* except that the pubescence is denser and often coarser throughout. The species is widely distributed in tropical America.

2. LIPPIA Houst.

Shrubs, glabrous or pubescent. *Lvs.* opposite or ternate, rarely alternate, entire, toothed or lobed. *Infl.* spicate, solitary and axillary or aggregated into terminal corymbs or panicles. *Fls.* small sessile, borne singly in the axils and often more or less 4-ranked. *Cal.* small, membranous. *Cor.* tube cylindric, limb oblique, spreading, somewhat 2-lipped. *Stam.* 4, didynamous, inserted about the middle of the corolla tube. *Ovary* 2-celled, each cell 1-ovulate; *style* short. *Fruit* small, dry, included in the calyx, dividing into 2 pyrenes at maturity.

Lvs. entire or with only a few obscure teeth

near the apex1. *L. micromera*

Lvs. conspicuously serrate or serrulate from

apex almost to the base2. *L. alba*

1. *L. micromera* Schau.

Spanish thyme

Griseb. Fl. 495: Urb. Symb. Ant. 4. 532; 8. 594: Britt. & Wils. Sci. Surv. Porto Rico 6. 142: Moldenke, Lilloa 4. 293.

Leafy shrub, with a strong odour of thyme, glandular-punctate throughout beneath the pubescence; *branches* tetragonal, villosulous; twigs axillary, very leafy; *petioles* very short; *lvs.* opposite (those on the twigs crowded so as to appear fasciculate), their blades small, 6-12 mm. long, 3-6 mm. wide, obovate-elliptic, sub-acute at apex, narrowed at base into the petiole, entire or sparsely crenate at the apex, revolute along the margins, strigose-pubescent above, villous or hirtellous-pubescent and subcanescent beneath, the midrib and secondaries mostly impressed above; *infl.* capitate, hemispheric, solitary in the upper axils of the twigs, very shortly pedunculate, equalling or shorter than the leaves; *bracts* loosely imbricate, membranous, elliptic, 3-5 nerved, pellucid, obtuse, pubescent, ciliate along the margins, shorter than the corolla-tube, the exterior ones slightly larger than the inner ones; *cal.* about 2 mm. long, bifid, long-villous; *cor.* white, yellowish in the throat, its tube subglabrous, punctate, about twice as long as the calyx.

Trinidad: Sieber, Fl. Trin. 86; Maraval (Herb. Trin. 4586, 6.9.1890); Arima-Blanchisseuse rd., garden (Herb. Trin. 13349 6.11.1938).

Tobago: Broadway 1989.

Cultivated as a pot-herb, and sometimes escaping from cultivation.

The typical form of the species is known only from northern S. America and Trinidad, but varieties are found in the Greater Antilles and Brazil.

2. *L. alba* (Mill.) N.E. Br.

For synonymy see Moldenke (*loc. cit.*)

Britt. & Wils. Sci. Surv. Porto Rico 6. 141; Moldenke, Lilloa 4. 294.

Aromatic densely puberulent *shrub*, up to 1 m. tall, usually much branched; *branches* elongate, slender, ascending, more or less pubescent; *lvs.* opposite or ternate; *petioles* 3-8 mm. long, cinereous-pubescent; *leaf-blades* ovate or oblong, 2-7 cm. long, usually 1.2-2.3 cm. wide, acute or obtuse at apex, serrate or serrulate along the margins (except at the very base) cuneate or narrowed into the petiole at the base, strigose-hirtellous or puberulent and more or less rugose (when mature) above, densely short-pubescent or tomentose with cinereous hairs beneath; *infl.* axillary, capitate, usually much shorter than the leaves or nearly equalling the petiole, solitary or rarely paired in all the upper leaf-axils; heads subglobose or shortly oblong, 8-12 mm. long; *bracts* ovate, 3-5 mm. long, the lowest one 3-3.5 mm. wide, nearly as long as the corollas; *cal.* 2-toothed; *cor.* purple, violet or white, its tube 4.5 mm. long, about 3 times as long as the calyx.

Trinidad: Britton & Britton 2197: *ICACOS* savanna (Herb. Trin. 2413 in part); Moruga (Herb. Trin. 8199 8.6.1916); Cedros (Herb. Trin. 8533, 3.11.1916).

Widely distributed throughout the West Indies, Mexico, Central America, tropical and subtropical South America to Argentina, and introduced elsewhere; polymorphic and variable.

3. *PHYLA* Lour.

Perennial procumbent or creeping *herbs*, with trailing or ascending stems, subglabrate or appressed-strigose with more or less cinereous hairs. *Lvs.* opposite, variously dentate, except at the base. *Infl.* spicate, axillary, the spikes cylindric, very densely flowered, usually greatly elongate in fruit, solitary, paired or in 3's in the leaf axils. *Fls.* small, sessile, borne singly in the axils of small bracts, not 4-ranked, otherwise with characters as in *Lippia*.

Lvs. rhomboid-ovate or deltoid1. *P. betulaeifolia*

Lvs. spatulate, oblanceolate or obovate

Lvs. appressed-strigillose, not canescent...2. *P. nodiflora* var. *reptans*

Lvs. densely strigose and conspicuously

canescent3. *P. strigulosa* var. *parvifolia*

1. *P. betulaeifolia* (H.B.K.) Greene

Lippia betulaeifolia H.B.K.

L. betulifolia Kunth

Cryptocalyx nepetaefolia Benth.

Griseb. Fl. 494: Moldenke, Lilloa 4. 296.

Spreading *herb*, with procumbent stems, rooting at the nodes, and ascending branches; *stems* and *branches* tetragonal when fresh, more or less appressed-strigose or strigillose with elongate whitish eglandular hairs; *petioles* slender, 4-20 mm. long, strigose like the branches or sometimes more densely villous with spreading elongate whitish hairs; *leaf-blades* thin-chartaceous or submembranous, rhomboid-ovate or deltoid, 1.5-8 cm. long, 1.5-4.7 cm. wide, acute at the apex, cuneately attenuate into the petiole at the base, coarsely serrate-dentate along the margins (except at the cuneate base) with sharply acute or subacuminate teeth, densely or sparsely appressed-strigose with elongate whitish hairs on both surfaces like the branches, the midrib and secondaries impressed above, prominent beneath; *infl.* usually solitary in the leaf-axils, sometimes paired or in 3's, mostly greatly abbreviated, shorter than the subtending leaves, at first ovate-capitate, later elongate-oblong; *bracts*, membranous, ciliate, cuneate from the dilated apex, abruptly cuspidate at apex, the cusp slightly surpassing the corolla; *fls.* very numerous, tiny, closely imbricate in many ranks; *cal.* less than 1 mm. long; *cor.* pale pink, about 1 mm. long.

Trinidad: Britton & Freeman 1055; Kuntze 1136; Chaguanas (Herb. Trin. 424, March 1860; 3764, 18.4.1889; 4539, 1890); savanna of Tarouba (Herb. Trin. 2411, 10.4.1865); Carenage (Herb. Trin. 5593, 19.4.1893); Erin (Herb. Trin. 9125, 11.5.1920); St. Augustine (Herb. Trin. 14600, 22.6.1950); Caroni (Crueger 2.5.1852 in Herb. Kew); Pitch Lake (Britton & Freeman 27.3.1920, in Herb. Kew); St. Augustine (Broadway 7.5.1929, in Herb. Kew).

A weed of waste and cultivated ground, especially wet places and rice fields.

From Cuba, Guatemala and Honduras to Brazil and Paraguay.

2. ***P. nodiflora* var. *reptans* (H.B.K.) Moldenke**

Lippia reptans H.B.K.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 495: Urb. Symb. Ant. 4. 551: Britt. & Millsp. Bah. Fl. 369: Britt. & Wils. Sci. Surv. Porto Rico 6. 142: Moldenke, Torreya 34. 9: Moldenke, Lilloa 4. 296.

Herb., creeping prostrate or ascending; *branches* more or less densely appressed-strigillose, 20-50 cm. long; *petioles* 5-10 mm. long; *leaf-blades* obovate-cuneate 2-6 cm. long, 3-30 mm. wide, obtuse or acutish at apex, cuneate at base and attenuate into the petiole, coarsely and sharply dentate from about the middle to the apex with divergent or slightly recurved teeth, more or less appressed-strigillose on both surfaces, green, not canescent, the midrib and secondaries usually quite prominent beneath, sometimes impressed above; *peduncles* axillary, solitary, very slender, mostly longer than the subtending leaves; *spikes* ovoid, becoming subcylindric and up to 2 cm. long in fruit; *bracts* closely imbricate, herbaceous, obovate-cuneate, short-acuminate at apex, membranous and ciliate along the margins, equalling the corolla tube; *cal.* 2-toothed, 2-carinate, the keels villosulous; *cor.* at first white, later fading to pink.

Trinidad: Broadway 5080.

West Indies, tropical central and south America.

3. ***P. strigulosa* var. *parvifolia* (Moldenke) Moldenke**

Phyla nodiflora var. *canescens* *sensu* Moldenke, Lilloa 4. 297.

P. yucatana var. *parvifolia* Moldenke

Lippia nodiflora var. *normalis* f. *sericea* Kuntze & f. *brevipes* Kuntze

Similar to var. *reptans*, but more or less conspicuously canescent throughout and the leaves mostly smaller, 7-20 mm. long and 2.5-10 mm. wide.

Trinidad: Kuntze 714.

Widely distributed in tropical America, but more abundant in sub-tropical and temperate S. America.

Typical *Phyla nodiflora* (L.) Greene is a very widely distributed pantropic and subtropic weed and is to be expected in Trinidad and Tobago. It may be distinguished by its thick, green, narrowly cuneate-spathulate leaves, whose venation is practically indistinguishable on the upper surface.

4. STACHYTARPHETA Vahl

Herbs or low *shrubs*, glabrous throughout or villous with simple hairs. *Lvs.* opposite or alternate, dentate, often rugose. *Infl.* terminal, spicate. *Fls.* sessile or semi-immersed in the rachis of the spike, each solitary in the axil of a bract. *Bracts* small and narrow, appressed or spreading, or else large, ovate or lanceolate, and imbricate. *Cal.* narrowly tubular, membranous or herbaceous, 5-costate, 5-dentate, the teeth equal or unequal, unchanged in fruit or sometimes variously split. *Cor.* white, blue or purple (red in cultivated species), its tube cylindric, straight or incurved, slender throughout or ampliate at the apex, its limb spreading 5-parted, the lobes broad, obtuse or retuse at apex, equal or unequal. *Stam* 2, anterior, inserted above the middle of the corolla-tube, included, *filaments* short, *anths.* unappendaged, the thecae divergent and dehiscent in one continuous line. *Staminodes* 2, posterior, small. *Ovary* 2-celled, each cell 1-ovulate. *Style* elongate; *stigma* terminal, orbicular, subcapitate. *Ovules* attached laterally near the base of the cells. *Fruit* oblong-linear, included by the fruiting-calyx, splitting on maturity into 2 hard 1-seeded cocci. *Seeds* erect, without endosperm.

Shrubby; furrows about as broad as the slender rachis; cor. white or pale blue....1. *S. cayennensis*
Herbaceous; furrows conspicuously narrower than the stout rachis; cor. purple.....2. *S. jamaicensis*

1. *S. cayennensis* (L.C. Rich.) Vahl [as 'cajanensis']

S. hirta H.B.K.

Verbena cayennensis L.C. Rich.

Valerianodes cayennense (L.C. Rich.) Ktze.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 494: Urb. Symb. Ant. 4. 533; 8. 596: Britt. & Wils. Sci. Surv. Porto Rico 6. 143: Moldenke, Lilloa 4. 299.

Shrub, 1-2.5 m. tall, much branched; *stems* and *branches* subterete, varying from loosely pilose to lanuginous-pubescent with canescent hairs, or even glabrate; *lvs.* membranous, ovate to elliptic, 3-7 cm. long, 1.6-2.4 cm. wide, obtuse or rounded (rarely subacute) at the apex, regularly crenate-serrate along the margins with subacuminate teeth, narrowed or obtuse at the base and more or less cuneate-decurrent into the petiole, sub-scabrous above with sparse strigillose hairs, not at all rugose, mostly glabrate beneath

except for the appressed strigillose venation; *infl.* slender, flaccid, up to 34 cm. long, glabrous, subglabrate, or only slightly pilosulous throughout; *rachis* scarcely or very slightly incrassate, its furrows about as broad as the rachis; *fls.* spreading during anthesis; *bracts* narrowly linear or subulate, setaceous-acuminate or aristate, scarious along the margins; *cal.* compressed, about 4 mm. long, 4-costate, glabrate, its rim 4-subulate-dentate, about equalling or surpassing the subtending bracts; *cor.* pale blue or white, salverform, its tube about equalling the calyx, its limb small, about 5 mm. wide; *style* included; *fruiting-calyx* erect, half-immersed in the furrows of the rachis.

Trinidad: Britton, Britton & Hazen 93; Britton & Hazen 29; Kuntze 654 and 1109; Hort. Trin. (Herb. Trin. 1928, 31.8.1888 and Herb. Trin. 3828, 17.6.1889); St. Clair (Herb. Trin. 3591, 12.3.1889); Princes Town (Herb. Trin. 4448, Dec. 1890); Aripo (Herb. Trin. 6746, *ann.* 1900); Cedros (Herb. Trin. 7161b, 28.9.1915).

Tobago: Charlotteville (Herb. Trin. 11090, 4.6.1924).

A common weed of waste ground, roadsides, &c.

Widely distributed in tropical America from Mexico and the Greater Antilles, throughout Central America and the West Indies to Peru and Argentina. Introduced into Hawaii and other parts of the Old World.

2. *S. jamaicensis* (L.) Vahl

Verbena jamaicensis L.

Valerianodes jamaicense (L.) Kuntze

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 494: Urb. Symb. Ant. 4. 533; 8. 596: Britt. Fl. Berm. 313: Britt. & Millsp. Bah. Fl. 366: Britt. & Wils. Sci. Surv. Porto Rico 6. 144: Moldenke, Lilloa 4. 300.

Herb. shiny, often purplish throughout, 0.6-1.2 m. tall, sparingly pubescent or glabrate throughout; *stems* and *branches* dichotomous, subtetragonal, usually glabrate except for the lanuginous-pilose nodes; *lvs.* alternate or opposite, thin-chartaceous or membranous, oblong, ovate or oval (rarely sub-rotund), 2-8 cm. long, 1.2-5 cm. wide, obtuse or acute at the apex, coarsely serrate along the margins with acute and spreading teeth, more or less ciliate-scabrous, cuneate-narrowed at the base and prolonged into the margined petiole, which is as long as the blades or shorter, glabrous on both surfaces or very slightly pilosulous on the venation beneath; *spikes* terete, stout, stiff, often flexuous, 15-50 cm. long, glabrous throughout; *rachis* conspicuously incrassate, its furrows much narrower than the rachis; *fls.* at first erect, later immersed in the thickened rachis; *bracts* medium or comparatively small, lanceolate or oblong-lanceolate, 5-8 mm. long, about 2 mm. wide, aristate-acuminate at the apex; *cal.* compressed,

about 5 mm. long, or about as long as the subtending bracts, its rim bifid, the teeth triangular or triangular-ovate; *cor.* salver-shaped, purple, 8-11 mm. long, its tube slightly curved, its limb about 8 mm. wide; *style* included; *fruiting-calyx* completely immersed in the furrows of the rachis.

Trinidad: Britton, Freeman and Brown 2775; Kuntze 755; St. Clair (Herb. Trin. 3579, 12.3.1889); Cedros (Herb. Trin. 7182, 15.9.1915); Balandra Bay (Herb. Trin. 8084, 21.6.1921) and many others.

A common weed of waste ground, roadsides, &c.

Widely distributed through tropical America from the southern United States through the West Indies, Mexico, and Central America to northern South America; introduced elsewhere.

DOUBTFUL AND CULTIVATED SPECIES

Stachytarpheta strigosa Vahl, differing from *S. jamaicensis* in being very strigose or hirsute throughout, in having a 4-toothed (not 2-toothed) calyx, and in its smaller corollas, is recorded from Trinidad by Grisebach in his Flora 494 (1861), by Urban in Symb. Ant. 4. 533 (1911), and by Britton & Wilson in Sci. Surv. Porto Rico 6.144 on the basis of a Crüeger specimen. The species occurs in the West Indies from the Dominican Republic, Puerto Rico & Mona Island, through St. Thomas, St. John and Tortola, to Trinidad.

Stachytarpheta australis Moldenke, differing from *S. cayennensis* in being conspicuously pilose-pubescent throughout the inflorescence, is recorded from Trinidad on the basis of E. A. Friend 217, and a Broadway collection from St. Clair. The species is widespread in South America.

Two other species, both with red flowers, *S. mutabilis* (Jacq.) Vahl and *S. coccinea* Schau. have been collected in Trinidad, but usually from gardens and not in recent years. While these two species may occasionally escape from cultivation they are certainly not native and very doubtfully naturalized.

A third red-flowered species, *S. trinitensis* Moldenke, based on a Broadway collection from Tabaquite, 20th September, 1918, and represented also by Herb. Trin. 7780, formerly confused with *S. coccinea* may not be native to Trinidad. It is otherwise known only from Margarita Island and the Paraguaná section of Venezuela.

5. *PRIVA* Adans.

Perennial herbs, mostly rather harshly pubescent throughout. *Lvs.* opposite or subopposite, mostly dentate, thin, deciduous. *Stems, branches* and *branchlets* mostly more or less tetragonal, often more or less decumbent. *Inf.* terminal or axillary, inde-

terminate, racemiform or often subspicate in anthesis, erect or subflexuous. *Fls.* hypogynous, each solitary in the axil of a small bractlet. *Cal.* mostly tubular in anthesis, 5-ribbed, often slightly 5-plicate, terminating in 5 short equal or sub-equal teeth, persistent and accrescent. *Cor.* more or less irregular, funnel or salver-shaped, surpassing the calyx, its cylindric tube straight or curved, its limb usually 2-lipped. *Stam.* 4, didynamous, inserted at or above the middle of the corolla tube, mostly included; *anths.* unappendaged, the thecae parallel or divergent only at the base; fifth stamen reduced to a minute staminode or absent. *Style* short, included, 2-lobed at the apex. *Ovary* 4-celled or by abortion 2-celled; *ovules* basal, erect, anatropous, solitary in each cell. *Fruit* a dry, often woody schizocarp. *Seeds* without endosperm.

1. *P. lappulacea* (L.) Pers.

Verbena lappulacea L.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 493: Urb. Symb. Ant. 4. 534; 8. 597: Britt. Fl. Berm. 313: Britt. & Millsp. Bah. Fl. 367: Britt. & Wils. Sci. Surv. Porto Rico 6. 144: Moldenke, Monog. Priva, 24-35: Moldenke, Lilloa 4. 303.

Perennial herb, up to 1 m. tall. *stems* spreading and decumbent, *branches* prostrate, ascending or erect, pilose-pubescent with curved and uncinat hairs; *petioles* slender, 0.8-3 cm. long, more or less pilose with scattered whitish hairs; *leaf-blades* ovate, 1.4-14.5 cm. long, 0.9-8.5 cm. wide, acute or acuminate at the apex, uniformly and coarsely serrate, except at base and apex, with blunt or acute and appressed teeth, mostly subtruncate or subcordate at the base, pilose or strigose above with scattered whitish bulbous-based hairs, pilose or puberulent beneath; *infl.* terminating the stems and branches, 4.5-21 cm. long, many-flowered, the flowers loosely alternate on the puberulent-pilose rachis; *bractlets* usually surpassing the pedicel in anthesis; *cal.* oblong-campanulate, regular, 2-3 mm. long, about 2.3 mm. wide, densely short-tomentose with uncinat hairs and scattered longer straight hairs, its rim 5-apiculate; *cor.* in Trinidad material pale lavender or white, elsewhere more commonly blue, pink, violet, or purple, its tube 3.3-3.6 mm. long; *fruiting-calyx* broadly ovate, conspicuously inflated, 5-7 mm. long, 3-4.5 mm. wide, densely uncinat-hispidulous; *cocci* 2-celled, glabrous, the dorsal surface echinate with 2 rows of short, straight, sharp spines.

Trinidad: Britton & Hazen 162; Kuntze *s.n.*; Lockhart, Herb. Trin. 433, 17.7.1842; Fendler 573 and *s.n.*; Tredholm *s.n.*; Hort. Trin. (Herb. Trin. 3826, 17.6.1889 and *s.n.* 8.10.1906); Tunapuna (Herb. Trin. 4524, June 1891 and Herb. Trin. 7309, 27.10.1915); Chacachacare (*s.n.*, *ann.* 1895); Pointe Gourde Islands (*s.n.*, 4.9.1912); Monos (Herb. Trin. 7450, 27.11.1915); Gasparillo (Herb. Trin. 8386, 30.12.1914); St. Augustine (Herb. Trin. 13980, 11.12.1947).

Tobago: Broadway 4845; Eggers 5832; Seitz 36.

A fairly common weed of shady places.

Cosmopolitan in the American tropics and subtropics from Florida through the West Indies, Mexico and Central America to Peru, Brazil and Bolivia; naturalized in Java.

6. AMASONIA L.f.

Subshrubs, low and bushy, woody only at the base, mostly branched from the base; *stems* and *branches* mostly naked below, leafy only at the summit. *Lvs.* simple, alternate, opposite or scattered, often approximate to form a crown beneath the inflorescence, deciduous, thin, exstipulate. *Infl.* indeterminate panicle or racemiform, terminal, erect, composed of numerous, usually trichotomous and often congested cymes, usually arranged in a second or sub-second fashion on the rachis, subtended by large, foliaceous, coloured and pellucid-glandular bracts, and smaller bractlets. *Fls.* solitary in the axils of the bracts or in 3-flowered cymules, pedicellate; mostly more or less secundly nutant or pendulous. *Cal.* broadly campanulate, 5-lobed, the lobes sub-equal and acute. *Cor.* mostly yellow or white, its tube cylindric, elongate, straight or curved, somewhat ampliate above, its limb 5-lobed, slightly 2-lipped. *Stam.* 4, didynamous, inserted near the base of the corolla-tube, included or exserted; *filaments* usually elongate; *anths.* with 2 parallel thecae jointed by a dorsal connective for two-thirds or half their length. *Style* elongate, exserted; *stigma* entire or very shortly bifid. *Ovary* bicarpellary, 4-celled, each cell containing one lateral ovule. *Fruiting-calyx* hardly accrescent. *Fruit* drupaceous, with a juicy exocarp and hard leathery endocarp, separating into 4 (by abortion 1-3) 1-seeded pyrenes. *Seeds* without endosperm.

1. *A. campestris* (Aubl.) Moldenke

A. erecta L.f.

A. punicea Vahl

Taligalea campestris Aubl.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 501: Moldenke, Torrey 34. 8 and Lilloa 4. 305.

Shrub, less than 1 m. tall; *branches* few, erect, strict, medullose, densely pubescent or puberulent with brownish hairs; *lvs.* spirally alternate, usually more or less clustered at about the middle or near the base of the branches, the lowest portion of the shoot mostly bare of leaves, the apical portion usually bearing a few or many bract-like leaves; *petioles* 5-15 mm. long, often slightly winged above, densely puberulent or short-pubescent; *leaf-blades* chartaceous or membranous, oblanceolate or obovate, 6.5-26 cm. long, 1.7-7 cm. wide, acute or very shortly acuminate at the apex, rather coarsely dentate except at the base or merely

repand, cuneately long-attenuate into the petiole, varying from rather densely strigose-velutinous to pubescent or sparingly puberulent on both surfaces; *peduncles* and *rachis* similar to the branches in pubescence; floriferous portion of the panicle narrow, 7-23 cm. long, very bracteose and densely flowered; secondary peduncles obsolete or to 1 cm. long, red, puberulent or pubescent; *pedicels* filiform, 1-7 mm. long, red, puberulent or pubescent; *bracts* numerous, conspicuous, lanceolate, oblong, or elliptic, 1.5-5 cm. long, 3-20 mm. wide, more or less dentate, stipitate, red or crimson when fresh, lightly pubescent or puberulent; *cal.* campanulate, 6-9 mm. long, 4-11 mm. wide, usually very lax, deeply 5-lobed, densely short-pubescent or puberulent, the lobes broadly lanceolate or ovate, acuminate, wide-spreading; *cor.* salver-shaped, yellow, its tube broadly cylindric 1.5-2.5 cm. long, rather sparsely short-pubescent or pilosulous.

Trinidad: Britton, Coker & Rowland 112; Eggers 1003 and 1389; Woods of Chaguanas (Herb. Trin. 2400, Feb. 1866); Piarco savanna (Herb. Trin. 4655, Apr. 1892; Herb. Trin. 6024, *ann.* 1895; Herb. Trin. 9379, 28.1.1920); Chaguanas (Herb. Trin. 5126, Jan. 1893); Aripo savanna (Herb. Trin. 5343, Mar. 1893); Toucouche (*sic*)=Mt. Tucuche (Herb. Trin. 6820, *ann.* 1898); Guanapo (Dannouse, 21.3.1904); Arima (Dannouse, *ann.* 1901); Guapo (Herb. Trin. 9402, 5.3.1899); and many other collections in various herbaria.

Commonly collected from areas of low bush or scrub on poor or gravelly soils around the savannas from Piarco to Aripo; rare elsewhere.

From Trinidad and Venezuela to south-central Brazil.

Doubtful Record

A sheet of *A. calycina* Hook. f. without collector's name, number or locality is presumably from a garden. The species is known only from cultivated material in American and European gardens, but is said to have been introduced from British Guiana.

7. PETREA *Houst.*

Shrubs, trees or woody *vines*. *Lvs.* opposite or whorled, deciduous, often roughened. *Infl.* axillary or terminal, indeterminate, racemiform, the racemes mostly elongate and many-flowered. *Bracts* mostly small or absent. *Fls.* hypogynous, perfect, alternate on the rachis. *Cal.* gamosepalous, mostly regular, tube cylindric or campanulate, normally 5-lobed, the lobes blue, violet, purple or white. *Cor.* salver-shaped, mostly darker blue or purple than the calyx, or white, mostly slightly irregular, 5-lobed, the lobes much shorter than the calyx-lobes. *Stam.* 4, didynamous, inserted near the middle of the corolla tube, included; *filaments* very short. *Stigma* capitate, usually oblique and bi-lobed. *Ovary* borne on a disk. 2-celled, each cell 1-ovulate. *Fruiting-calyx*

incrassate, tube not much accrescent and losing its blue colour, lobes greatly accrescent and stiffened. *Fruit* drupaceous, enclosed by the mature calyx.

1. *P. arborea* H.B.K.

Blue Petrea

P. erecta Lodd.

P. vincentina Turcz.

P. splendens Landsbergen

Griseb. Fl. 498: Moldenke, Monog. Petrea 22-25 and Lilloa 4. 308.

Shrub or small *tree*, sometimes subscandent; *branchlets* sparsely short-pubescent, glabrescent in age; twigs more densely pubescent; *lvs.* opposite, sessile or subsessile; *petioles* obsolete or 1-3 mm. long and hidden by the somewhat clasping leaf-base; *leaf-blades* elliptic, 6.5-16 cm. long. 2.5-7.7 cm. wide, obtuse or slightly retuse at the apex, entire but wavy along the margins or obscurely dentate near the middle, cordate or subcordate at the base; rough and scabrid on both surfaces, not at all pubescent; *infl.* axillary, appearing with or usually after the leaves, ascending or nutant, 4-16 cm. long; *peduncles* and *pedicels* densely short-pubescent; *cor.* blue; *fruiting-calyx* tough, its tube to 7 mm. long and 55 mm. wide, densely spreading-pubescent, its lobes up to 18 mm. long and 8 mm. wide, sparsely short puberulent.

Trinidad: Monos (Herb. Trin. 2418, Feb. 1867); Chacachacare (Herb. Trin. 10463, 3.4.1921); many other collections mainly from gardens.

Bocas Islands and N.W. peninsula; widely cultivated elsewhere.

Known in the wild state only from Trinidad, Venezuela and British Guiana.

CULTIVATED SPECIES

P. arborea var. *broadwayi* Moldenke, differing from the typical form in having white corollas, occurs in cultivation in Trinidad.

P. kohautiana Presl. (*P. volubilis* Jacq. of Griseb. Fl. 498), a native of the Lesser Antilles, differing notably in being a woody vine, occurs in cultivation in both Trinidad and Tobago. Its corolla is blue.

P. kohautiana var. *alba* (Freeman & Williams) Moldenke (*P. volubilis* var. *alba* Freeman & Williams, Useful & Ornamental Pl. Trin. and Tob. 127, 1928, 'White Petrea') differs from the typical form in having white corollas, and occurs in cultivation.

8. CITHAREXYLUM B. Juss.

Trees or *shrubs*, *branches* and *branchlets* tetragonal, sometimes spiny; leaf-scars mostly large, corky and elevated, borne

on more or less prominent sterigmata. *Lvs.* opposite or whorled, entire or dentate, deciduous, exstipulate, usually bearing a pair of prominent glands at the base. *Infl.* indeterminate, racemiform or spicate, axillary and terminal, usually many-flowered. *Fls.* small, each subtended by a bractlet. *Cal.* tubular or cyathiform, thin, accrescent, truncate, 5-toothed or 5-lobed. *Cor.* funnel- or salver-shaped, usually yellow or white, tube narrow-cylindric, limb spreading. *Stam.* 4, didynamous, inserted at or above the middle of the corolla tube, included; *filaments* very short; *anths.* ovate or sagittate. *Stigma* shortly bifid. *Ovary* 4-celled, 2-carpellary, each cell containing one lateral anatropous ovule. *Fruiting-calyx* enlarged and indurated. *Fruit* drupaceous, with juicy exocarp and hard endocarp, with two 2-celled and 2-seeded pyrenes often separated by a median fissure.

Leaf-blades firmly chartaceous, usually thick
and stiff when mature; fls. sessile
or very short-pedicellate

Leaf-blades glabrous on both surfaces.....1. *C. fruticosum*

Leaf-blades more or less pubescent beneath

Leaf-blades densely velutinous villous-
pubescent beneath1a. *C. fruticosum* var.
brittonii

Leaf-blades merely roughened, pube-
rulent, or very short-pubescent
beneath, or short-villous only along
the larger veins1b. *C. fruticosum* var.
subvillosum

Leaf-blades thin-chartaceous or mem-
branous, mostly thin and fragile
even when mature; fls. distinctly
pedicellate2. *C. spinosum*

1. *C. fruticosum* L.

White fiddlewood

C. cinereum L.

C. coriaceum Desf.

C. quadrangulare Griseb. (in part)

C. villosum Griseb.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 497: O. E. Schulz in Urb. Symb. Ant. 6. 61:
Britt. & Wils. Sci. Surv. Porto Rico 6. 145-146: Moldenke, Lilloa
4. 310.

Shrub or tree, unarmed, up to 16 m. tall, branches and
branchlets grey, tetragonal, glabrous, often ribbed; twigs and
shoots light brown, acutely tetragonal, glabrous, often ribbed;
petioles 1-1.5 cm. long, more or less margined, glabrous, leaf-blades
very firmly chartaceous, oblong or elliptic, 4.5-21 cm. long,

1.5-8 cm. wide, acute, very shortly acuminate or obtuse, rarely emarginate at apex, entire, or coarsely serrate on young shoots, cuneate at the base, with 1-3 pairs of glands at the very base, one pair of which is always much elongated and parallel to the petiole, glabrous on both surfaces, very glossy, especially above; *infl.* of mostly terminal but sometimes axillary racemes, 3.5-26.5 cm. long, the axillary usually abbreviated, the terminal sometimes branched near the base, mostly nutant, many-flowered; *peduncles* and *rachis* slender, brown, glabrous; *pedicels* filiform, to 1 mm. long or obsolete, glabrate; *cal.* cyathiform, 2.5-4 mm. long, glabrous, its rim truncate or very slightly 5-repand-dentate and ciliate; *cor.* white, its tube 2-6 mm. long, glabrous outside, villous within; *fruiting-calyx* broadly cupuliform, 2-3 mm. long, 5-6 mm. wide, glabrous, its rim irregularly and shallowly lobed.

Trinidad: Bailey & Bailey *s.n.*; Broadway 6374, 6658 (in part) and *s.n.*; Maracas Bay (Dannouse *s.n.*, 4.6.1900).

Tobago: Broadway 4064 (in part); Eggers 5484 (in part).

Fairly widely distributed in the drier parts of both islands.

From southern Florida through the West Indies to Venezuela and the Guianas.

1a. ***C. fruticosum* var. *brittonii* Moldenke**

Hairy Cutlet

C. broadwayi O. E. Schulz

Urb. Symb. Ant. 7. 354; Marshall Trees, Trin. & Tob. 76; Moldenke, Lilloa 4. 311.

This variety differs from the typical form in having its leaf-blades densely velutinous villous-pubescent beneath. At the time of anthesis the leaves are very thin-membranous, and young leaves even at other times are very thin. Even the fully-matured leaves are much thinner than in the ordinary form of the species and have less prominent venation.

Trinidad: Britton 2921; Cedros (*s.n.*, 6.6.1911 and Herb. Trin. 7203, 16.9.1915); Erin (Herb. Trin. 7344, 11.11.1915); San Fernando (Herb. Trin. 8363, 6.9.1916); Mouth of Godineau River (Herb. Trin. 10031, 12.4.1921); Quinam (Herb. Trin. 12192, 25.6.1929); Morne Diabolo (Herb. Trin. 12035, 30.8.1928); S. Watershed Reserve (Herb. Trin. 12238/39, 11.9.1929).

Widely distributed in southern districts, but never common. Endemic.

1b. ***C. fruticosum* var. *subvillosum* Moldenke**

Fedde Rep. 37. 223: Moldenke, Lilloa 4. 312.

This variety differs from the typical form of the species in having its leaf-blades merely roughened-scabridous, puberulent, or very short-pubescent beneath or short-villous only along the larger venation.

Trinidad: Herb. Trin. 7224.

Found with the typical form of the species practically throughout its range.

2. *C. spinosum* L.

Cutlet

C. surrectum Griseb.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 497: Urb. Symb. Ant. 6. 64: Britt. Fl. Berm. 316: Britt. & Wils. Sci. Surv. Porto Rico 6. 146: Marshall, Trees, Trin. & Tob. 76: Moldenke, Lilloa 4. 312: Sandwith, Kew Bull. 1938. 373.

Shrub or *tree*, up to 12 m. tall, unarmed, *branches* and *branchlets* usually acutely tetragonal, grey or stramineous, glabrous, twigs stramineous or brown, glabrate; *petioles* 0.7-2.4 cm. long, glabrous; *leaf-blades* thin-chartaceous or membranous, elliptic, elliptic-oblong or oblong, rarely subovate, 3.5-29 cm. long, 1.3-11.3 cm. wide, mostly large and thin, obtuse (rarely emarginate), acute or short-acuminate at the apex, entire (or rarely irregularly and coarsely dentate on young shoots), acute at base and usually bearing 1 or 2 black glands, glabrous on both surfaces or sparsely barbellate along the sides of the midrib and in the axils of the secondaries beneath; *infl.* of simple or compound, axillary or terminal racemes with 1-5 pairs of basal branches, 2.5-35 cm. long, many-flowered, nutant; *peduncles* and *rachis* slender, brown, very sparsely and minutely pulverulent or glabrous; *pedicels* very slender, 1.5-4 mm. long, glabrate; *cal.* cyathiform, 3-4 mm. long, glabrous, its rim ciliate and obsoletely 5-dentate; *cor.* white, its tube 4-6 mm. long, glabrous outside, villous at the mouth within; *fruiting-calyx* broadly cupuliform, about 3 mm. long, 5-6 mm. wide, glabrous, its rim shallowly and irregularly lobed.

Trinidad: Bailey & Bailey *s.n.*; Broadway 6658; Fendler 597; Gasparee (Herb. Trin. 430, 27.8.1848); Madamas Bay (Herb. Trin. 12905, 4.6.1933); Hort. Trin. (Herb. Trin. 3836, 25.6.1889 and Herb. Trin. 4508, 27.4.1891).

Tobago: Eggers 5484 (in part); Sandwith 1821 in Herb. Kew; Roadside, Scarborough to Farm (Herb. Trin. 11155, 6.6.1925); Little Tobago (Herb. Trin. 12958, 7.9.1933).

Confined to dry areas in north Trinidad & Tobago.

From Bermuda, through the West Indies to the Guianas; also widely cultivated.

Most of the glabrous Trinidad & Tobago material, as also most of that from northern South America, seems to be more or less intermediate between typical *C. fruticosum* and typical *C. spinosum* and may represent a natural hybrid between these two species (Moldenke, *loc. cit.*). The typical forms of both

C. fruticosum and *C. spinosum* are found abundantly in the Lesser Antilles, but the southernmost specimens (from Tobago, Trinidad, Venezuela and the Guianas) seem different from both. The hybrid form is well represented by Broadway 4064 (type of $\times$ *C. hybridum* Moldenke in herb N.Y. Bot. Gard.) and 6658, Eggers 5485, and Sandwith 1821.

9. DURANTA L.

Shrubs, glabrous or pubescent, often spiny. *Lvs.* opposite or whorled, entire or dentate. *Infl.* indeterminate, racemiform, terminal or axillary. *Fls.* small, pedicellate, in the axils of bracts. *Cal.* tubular or subcampanulate, truncate, 5-costate, each rib terminating in a short subulate tooth. *Cor.* salver-shaped, its tube cylindric, straight or curved above, exserted from the calyx, its limb spreading, 5-parted. *Stam.* 4, didynamous, included, inserted at or above the middle of the corolla tube; *filaments* very short; *anths.* sagittate, dorsifixed, erect, with parallel thecae. *Ovary* more or less completely 8-celled, composed of four 2-celled carpels, each cell 1-ovulate. *Style* terminal, shorter than or equalling the lower stamens. *Stigma* obliquely subcapitate, very shortly and unequally 4-lobed. *Fruiting-calyx* accrescent, flask-shaped, usually surpassing and closely appressed to the fruit. *Fruit* drupaceous, the exocarp fleshy, the endocarp hard, pyrenes 4, each 2-celled and 2-seeded.

1. *D. repens* L.

D. plumieri Jacq.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 498: Britt. & Millsp. Bah. Fl. 372: Urb. Symb. Ant. 4. 536; 8. 599: Britt. & Wils. Sci. Surv. Porto Rico, 6. 146-147: Moldenke, Lilloa 4. 314.

Shrub or small *tree* up to 6 m. tall, *branches* slender, often drooping or trailing, spiny or unarmed, *branchlets* tetragonal; *lvs.* numerous, ovate-elliptic, oval, or obovate, 1.5-5 cm. long, varying from obtuse to apiculate or acuminate at the apex, entire or serrate above the middle, cuneate at the base into the short petiole, glabrate on both surfaces; *infl.* a terminal or axillary raceme, 5-15 cm. long, many-flowered, erect or recurved, often paniculate; bractlets minute, occasionally subfoliaceous; *pedicels* 1.5 mm. long; *cal.* tubular, 3-4 mm. long, angled, its teeth triangular at the base, subulate above, shorter than the tube; *cor.* lilac or white, tube surpassing the calyx, limb 7-9 mm. wide; *frt.* yellow, globular, 7-11 mm. diam., completely enclosed by the accrescent yellowish calyx, which is produced into a curved beak at the apex.

Trinidad: Erin (Herb. Trin. 7330, 10.11.1915 and Herb. Trin. 11189, 27.1.1925); Quinam (Herb. Trin. 14466, 4.11.1949); and many specimens from gardens.

Southern districts only, not common wild, but often grown in gardens.

An extremely polymorphic and variable species found throughout sub-tropical and tropical America, south to Argentina; also introduced into the Old World tropics and widely cultivated.

10. AEGIPHILA Jacq.

Trees, shrubs or woody vines, branches and branchlets tetragonal or subterete. Lvs. simple, deciduous, usually opposite, rarely ternate, exstipulate. Infl. determinate, the cymes often resembling panicles, false umbels, glomerules, thyrsi, or even reduced to a single flower, axillary or terminal. Fls. regular and perfect, but usually conspicuously declinous. Cal. gamosepalous, more or less campanulate, cyathiform, or tubular, its margins truncate and entire or 4- or 5-toothed or -lobed, conspicuously accrescent, becoming greatly incrassate and indurated in fruit. Cor. hypogynous, gamopetalous, funnel- or salver-shaped, its tube cylindric, its limb equally 4- or 5-parted, its lobes imbricate. Stam. 4 or 5, equal, isomorphic, perfect, inserted below the mouth of the corolla-tube and above its base, included or exerted, alternate with the corolla-lobes; pistil one, style terminal or subterminal, stigma bifid, its branches elongate and awl-shaped. Ovary superior, perfectly or imperfectly 4-celled, each cell 1-ovulate. Fruit drupaceous, typically 4-seeded, 1-3-seeded by abortion, the seeds without endosperm.

Infl. in the form of typical cymes, axillary

High-climbing vine, calyx-rim truncate
in anthesis, cymes subumbellate
and involucrate.....1. *A. macrantha*

Shrub or tree, calyx-rim lobed in
anthesis, cymes not subumbellate
or involucrate2. *A. integrifolia*

Infl. paniculate, mostly terminal

Vine, calyx-rim lobed in anthesis3. *A. elata*

Trees or shrubs, rarely semi-scandent,
calyx-rim truncate in anthesis

Branchlets glabrous

Infl. short, fruiting-calyx cupuliform,
closely appressed to the base of the
fruit4. *A. obovata*

Infl. elongated, fruiting-calyx patelli-
form, widely spreading, deeply
lobed5. *A. martinicensis*

Branchlets pulverulent, puberulent, or
tomentulose

Leaf-blades more or less falcate
and conduplicate, subcoriaceous,
fruiting-calyx puberulent, flask-
shaped when young6. *A. perplexa*

Leaf-blades not falcate or conduplicate chartaceous, fruiting-calyx glabrate, not flask-shaped when young

Leaf-blades up to 10.5 cm. long, infl. small, rim of fruiting-calyx sub-truncate or entire7. *A. laxiflora*

Leaf-blades up to 25 cm. long, infl. large, rim of fruiting-calyx deeply lobed or split5. *A. martinicensis*

1. *A. macrantha* Ducke

Clerodendrum capitatum Klotzsch

Ducke, Archiv. Jard. Bot. Rio de Jan. 4. 173; Moldenke, Monog. Aegiphila 319-320; Phytologia 1. 234; Lilloa 4. 316.

Vine, usually high-climbing, *branches* and *branchlets* minutely puberulent; *lvs* opposite or approximate; *petioles* 7-12 mm. long, minutely puberulent or glabrate, blades chartaceous or subcoriaceous, ovate-oblong or elliptic, 8-14 cm. long, 5-8 cm. wide, acute or short-acuminate at the apex (rarely obtuse or retuse), entire, acute or slightly cuneate (rarely rounded or obtuse) at the base, glabrous on both surfaces except along the midrib and larger veins beneath; *infl.* axillary, cymes solitary, opposite, 4-8 cm. long, about 5 cm. wide, dense, capitate or subumbellate, few- or many-flowered, conspicuously bracteate; *peduncles* strict, 3-6 cm. long, minutely puberulent or glabrate; *pedicels* quite short; *bracts* large, foliaceous, numerous, varying from ovate-lanceolate or oblong to elliptic, up to 3.5 cm. long, short-stipitate, entire, acute at both ends, glabrous, often simulating a basal involucre around the subumbellate flowers: *cal.* turbinate or obconic, 8-9 mm. long, 6-7 mm. wide, puberulent or glabrescent, its rim 4-toothed; *cor.* white or cream-coloured, 14-28 mm. long.

Trinidad: Herb. Trin. 1899, without date or locality, but apparently an old sheet from the Crueger herbarium, is the only record for the colony.

British and French Guiana and northern Brazil.

2. *A. integrifolia* (Jacq.) Jacks.

Larwood, Bois sendu

A. arborescens Vahl

Callicarpa integrifolia Jacq.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 499: Marshall, Trees Trin. & Tob. 75: Moldenke Monog. Aegiphila 337-340; Phytologia 1. 226-228; Lilloa 4. 317.

Shrub or *tree* 3-9 m. high, pith ample, *branches* and *branchlets* acutely tetragonal, flattened at the nodes, deeply channelled along the sides, rather densely incanous-pubescent or sericeous; *lvs.*

opposite or approximate; *petioles* 4-13 mm. long, incanous pubescent, blades chartaceous or membranous, oblong, obovate or elliptic, 7.5-35 cm. long, 3.5-15 cm. wide, acuminate at the apex, entire or denticulate, long-attenuate at the base and decurrent into the petiole, appressed-hirtous or incanous-tomentose above, becoming glabrescent, appressed sericeous-puberulent or incanous-tomentose beneath, especially along the larger veins, gland-dotted beneath, slightly aromatic; *infl.* axillary, cymes solitary, opposite, half as long as the subtending leaves or less, di- or trichotomous, dense, many-flowered, congest-corymbose or loose; *fls.* copious, pronouncedly declinous; *peduncles* 2-5 cm. long, densely strigose-sericeous and incanous; *pedicels* obsolete or up to 5 mm. long; *bracts* absent, bractlets obsolete or few and linear; *cal.* funnel-form or campanulate, 5-8 mm. long, about 3 mm. wide, densely incanous-sericeous, its rim acutely 4-dentate or lobed; *cor.* white or yellowish, 6-16 mm. long; *fruiting-calyx* indurated, cupuliform, rather shallowly and irregularly lobed, investing the base of the fruit; mature *fruit* orange.

Trinidad: Arima (Herb. Trin. 429, 13.8.1861 and Dannouse s.n., 4.4.1904); Oropouche (Herb. Trin. 2385, 3.8.1865); Dibé valley (Herb. Trin. 4770, 26.8.1892); Southern Central rd. (Herb. Trin. 7164, 28.9.1915); Cedros (Herb. Trin. 8579, 7.11.1916); Cumuto (Herb. Trin. 10751, 9.9.1924); Matura (Herb. Trin. 11329, 1.9.1925); S.W. Reserve (Herb. Trin. 12232, 23.8.1929); rd. between Piarco and Mausica (Herb. Trin. 13644, 19.8.1940); Maracas bay (Herb. Trin. 14143, 15.11.1947); Cap de Ville (Herb. Trin. 14499, 6.11.1949); and many collections in various herbaria.

Fairly common in second growth in the drier areas.

From Trinidad and northern South America to central Brazil, Bolivia and Peru.

3. *A. elata* Sw.

A. cornifolia (Willd.) Kunth

A. laevis Poepp.

A. macrophila H.B.K.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 500: Urb. Symb. Ant. 8. 600: Moldenke Monog. Aegiphila 462-466; Phytologia, 1. 198-199; Lilloa 4. 318.

Woody *vine*, 2-8 m. high, *branchlets* obtusely tetragonal, glabrous or minutely puberulent towards the apex; *petioles* 5-12 mm. long, puberulent or slightly ferrugineous-pubescent, blades coriaceous when mature, very shiny, ovate or oblong to elliptic, 7-20 cm. long, 2.5-9 cm. wide, abruptly attenuate or narrowly acuminate at the apex, entire, blunt or rounded at the base or rarely subcordate, glabrous above, appressed pubescent on the larger veins beneath, glabrescent and often gland-dotted when old; *infl.* axillary and terminal, axillary cymes one-third or half

as long as the subtending leaves, opposite, many-flowered; terminal panicles corymbose or thyrsoid, about 16 cm. long and 11 cm. wide, erect, usually leafless; *peduncles* 1-4 cm. long, minutely puberulent or glabrate; *pedicels* 4-8 mm. long, puberulent; *cal.* turbinate, funnel-like or cupuliform, 2-4 mm. long, 2.6-4.2 mm. wide, puberulent or pubescent, its rim distinctly 4-lobed; *cor.* yellowish, 7-14 mm. long; *fruiting-calyx* greatly enlarged and indurated, cupuliform, about 5 mm. long, 6-10 mm. wide, roughened, glabrate, its rim shallowly and irregularly lobed or sometimes deeply split; *fruit* yellow.

Trinidad: Broadway 3334; Crueger *s.n.*; Fendler 570; Lockhart 231; Arima (Herb. Trin. 428, 14.8.1861); rd. to Maracas (Herb. Trin. 2384, 13.5.1868); Oropouche (Herb. Trin. 2390, 11.7.1865); Mayaro (Herb. Trin. 11056, 13.5.1925); rd. to Maracas falls (Herb. Trin. 14401, 28.7.1949).

Widely distributed but not common.

From Cuba and Mexico throughout the West Indies and Central America to Venezuela and the Guianas; mostly rare on the continent.

4. *A. obovata* Andr.

Goatwood

A. dubia Moldenke

A. sylvatica Greg.

Moldenke, Monog. *Aegiphila* 391-394; *Phytologia* 1. 252-253; *Lilloa* 4. 319.

Semi-scandent *shrub* or small *tree*, *branches* and *branchlets* obtusely tetragonal or subterete, glabrate; *petioles* about 5 mm. long, glabrous; *leaf-blades* thin-membranous, elliptic or elliptic-oblong to obovate or oblanceolate, 5-15 cm. long, 2-6 cm. wide, the larger ones short-acuminate, the smaller and more elliptic ones blunt at the apex, entire or coarsely subdentate, or repand-sinuate above the middle on the larger and broader leaves, acute or sub-acuminate at base, glabrate on both surfaces, frequently undate and very fragile in drying, marked with several black glandular discs along the midrib, especially near the base beneath; *infl.* axillary and terminal, axillary cymes many-flowered but not dense, terminal panicle 5.5-9 cm. long, 2.5-4.5 cm. wide, usually composed of 1-3 small cymes; *peduncles* 2-4.5 cm. long, glabrate; *pedicels* 1-2 mm. long, glabrous; *bractlets* setaceous; *cal.* turbinate or campanulate, about 2.6 mm. long and 3.6 mm. wide, glabrous, its rim subtruncate, sometimes slightly repand; *cor.* pale yellow or white, very fragrant, often long-persistent on the maturing fruit, about 12.4 mm. long; *fruiting-calyx* greatly enlarged, cupuliform, about 4 mm. long and 6 mm. wide, verrucose, rather closely investing the very base of the fruit, glabrate, its rim shallowly scalloped; *fruit* orange.

Trinidad : Broadway 2584, 3157, 6349, 6396, 6406 & 9128; Circular rd. (Herb. Trin. 2386, 12.10.1865); Tamana (Herb. Trin. 2389, 22.5.1868, isotype); Fyzabad (Herb. Trin. 12026, 27.8.1928); Southern watershed reserve (Herb. Trin. 12163 and 12180, 24-26.6.1929); Mt. St. Benedict (Herb. Trin. 13658, 10.6.1939).

Tobago: Broadway 2973 & 9064; Greg. *s.n.*; Seitz 61 & 92; Mason Hall (Herb. Trin. 11115, 6.6.1925); Scarborough (Herb. Trin. 14516, 5.12.1949).

Widely distributed in the drier areas of both islands.

Endemic.

5. *A. martinicensis* Jacq.

For synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 500; Urb. Symb. Ant. 4. 536; Britt. & Wils. Sci. Surv. Porto Rico 6. 147-148; Moldenke, Monog. Aegiphila, 377-382; Phytologia 1. 235-237; Lilloa 4. 320.

Shrub or slender *tree* 1-5 m. tall, *branches* or *branchlets* obtusely tetragonal or subterete, minutely puberulent or glabrescent; *lvs.* very variable; *petioles* 5-14 mm. long, minutely puberulent; *leaf-blades* usually chartaceous, sometimes membranous, oblong-lanceolate or oblong, 8-25 cm. long, 3-10 cm. wide, acuminate at the apex, entire, narrowed and acute or obtuse and rounded at the base, usually glabrous on both surfaces, sometimes faintly puberulent or glandular-punctate; *infl.* axillary and terminal, axillary cymes solitary, opposite, spreading, many-flowered, trichotomous, half as long as or equalling the subtending leaves, terminal panicle thyrsoid, often pyramidal, up to 17 cm. long and 13 cm. wide, leafy; *fls.* inodorous; *peduncles* 2.5-7.5 cm. long, puberulent; *pedicels* 2-4 mm. long, minutely puberulent; *cal.* campanulate, turbinate or funnel-shaped, 2-3 mm. long, 1.5-3 mm. wide, minutely puberulent or glabrous, its rim truncate, subentire or 4-mucronulate; *cor.* white or pale yellow, 5.2-12.5 mm. long; *fruiting-calyx* greatly enlarged and indurated, very shallowly cupuliform or patelliform, very loose and spreading, not at all investing the fruit, about 6 mm. wide, its rim irregular, with large rounded lobes, scarious along the margins; *fruit* yellow or red.

Trinidad: Broadway *s.n.*; Sieber, Fl. Trin. 85.

From Cuba and Jamaica, through the West Indies, to Panama, Colombia and Venezuela; also cultivated; rare on the continent.

There is no material in Herb. Trin. and nothing is known of its local distribution. It might even be doubted, in view of the unreliability of many of the Sieber records from Trinidad, if it should be included in this Flora at all.

6. *A. perplexa* Moldenke

Moldenke in Fedde Rep. 33. 136; Monog. Aegiphila 388-389; Phytologia 1. 258; Lilloa 4. 321; Sandwith in Kew Bull. 1938. 373.

Shrub or small *tree*, *branches* and *branchlets* obtusely tetragonal or subterete, puberulent towards the apex, glabrescent in age; *petioles* 5-6 mm. long, minutely puberulent or glabrate; mature *leaf-blades* firm or subcoriaceous, shiny on both surfaces, oblong or slightly obovate to elliptic, 4.5-12 cm. long, 3-6.5 cm. wide, very obtusely rounded or sub-acute (sometimes subacuminate) at apex, entire, acuminate at base, frequently falcate and partly conduplicate along the midrib at the base, practically glabrate on both surfaces, densely and minutely glandular-punctate beneath and often marked with a few scattered glandular discs; *infl.* axillary and terminal, frequently terminating short axillary twigs; axillary cymes solitary, opposite, 5-7 cm. long, 4-5 cm. wide, rather loosely many-flowered; terminal panicle thyrsoid, about 6 cm. long and wide, leafy; *peduncles* 2-4 cm. long, minutely puberulent; *pedicels* 2-5 mm. long, minutely puberulent; *bracts* foliaceous, oblong, stipitate, 1-3.5 cm. long, up to 1.5 cm. wide, glabrous; *bractlets* linear; *cal.* campanulate, about 3.5 mm. long and 2.5 mm. wide, puberulent, its rim subtruncate and 4-apiculate; *cor.* pale yellow, about 9 mm. long; *fruting-calyx* greatly enlarged, indurated, puberulent, at first decidedly flask-shaped or obvolvate, and completely enclosing the immature fruit, later becoming shallowly cupuliform and much thickened (on verrucose pedicels) to 6 mm. long and 9 mm. wide, its rim subtruncate, eventually becoming irregularly and rather shallowly scalloped or split; *fruit* orange.

Trinidad: Fendler 571 and 592; Moruga (Herb. Trin. 7606, 27.1.1916); Maracas bay rd. (Herb. Trin. 11229, 10.7.1924); head of Maraval valley (Herb. Trin. 13989, 15.11.1947); hillside above St. Joseph (Herb. Trin. 14504, 15.11.1949).

Tobago: Broadway 4243; Eggers 5540; Sandwith 1801 in Herb. Kew; Charlotteville (Herb. Trin. 11080, 4.6.1925).

Dry hillsides, not common.

Known also from Venezuela.

7. *A. laxiflora* Benth.

A. laevis Griseb.

A. trinitensis Britton

A. laeviflora Briq.

Griseb. Fl. 499; Britt. in Bull. Torrey Club 50. 54; Moldenke, Monog. Aegiphila 389-391; Phytologia 1. 231; Lilloa 4. 322.

Small *shrub*, up to 3 m. high, *stems* and *branches* light grey or almost white, subterete or obtusely tetragonal, branchlets brownish, minutely puberulent or glabrate; *petioles* 1-5 mm. long, minutely puberulent or glabrous; *leaf-blades* very thin-membranous or subchartaceous, ovate or ovate-elliptic to oblong or lanceolate,

sometimes very slightly falcate, 3-10.5 cm. long, 1.5-5 cm. wide, acute or very shortly and abruptly acuminate at apex, entire, narrowed or acuminate at base, minutely puberulent or roughened above, glabrescent in age, glabrate and densely glandular-punctate and sometimes marked with a few scattered glandular discs beneath; *infl.* axillary and terminal, mostly terminating short lateral twigs which are 8-11 cm. long; axillary cymes few, solitary, opposite, shorter than the subtending leaves, loose, often few-flowered; terminal panicle 2.5-4 cm. long, 2-4 cm. wide, often extremely diminutive, loosely many-flowered or rather dense, leafy; *peduncles* very slender or filiform, 6-30 mm. long, minutely puberulent or glabrous; *pedicels* 1-6 mm. long, minutely puberulent or glabrous; *bracts* foliaceous, lanceolate or oblong; *bractlets* linear; *cal.* turbinate or obconic 2.4-3.5 mm. long, 2.6-3.2 mm. wide, puberulent, its rim subtruncate, subentire or minutely 4-apiculate, sometimes somewhat repand-dentate or split with age; *cor.* white, 10-15.5 mm. long; *fruiting-calyx* enlarged and indurate, cupuliform, about 3.5 mm. long and 7 mm. wide, glabrate, its rim entire, closely investing the lower third of the fruit.

Trinidad: Broadway 7386 & *s.n.*; Mrs. Broadway *s.n.*; Cruieger *s.n.*; Johnston 114; Lockhart *s.n.*; Riley 64; Maracas (Dannouse, 18.5.1906); St. Ann's (Herb. Trin. 9137, 10.5.1920); Buenos Ayres, Erin (Herb. Trin. 9463, 9.5.1919).

Not common, but perhaps fairly widely distributed in the drier areas.

Known also from British Guiana and Venezuela.

11. VITEX Tourn.

Trees or shrubs. *Lvs.* opposite, palmately compound. *Infl.* determinate, in sessile or pedunculate axillary cymes or terminal panicles or heads. *Fls.* hypogynous, perfect, more or less irregular. *Cal.* campanulate, rarely tubular or funnel-shaped, 5-dentate or 5-parted, rarely 3-parted. *Cor.* white, blue, violet, or yellowish, salver-shaped, irregular, the limb slightly 2-lipped, the upper bifid, the lower trifid. *Stam.* 4, didynamous, inserted in the corolla-tube. *Style* terminal, filiform, slightly bifid at the apex. *Ovary* at first imperfectly 2-celled, during anthesis usually 4-celled, the cells 1-ovulate. *Ovules* attached laterally at or above the middle of the cell. *Fruit* drupaceous, more or less fleshy, 4-celled. *Seeds* obovate or oblong, erect without endosperm.

Inflorescence paniculate; calyx deeply lobed. 1. *V. compressa*

Inflorescence not paniculate; calyx-rim truncate or subtruncate

Inflorescence capitate or subcapitate 2. *V. capitata*

Inflorescence loosely and divaricately cymose 3. *V. divaricata*

1. *V. compressa* Turcz.

V. berteriana Pittier
V. brittoniana Moldenke
Cornutia pentaphylla Pavon

Moldenke, Lilloa 4. 324.

Tree up to 20 m. tall, trunk up to 50 cm. in diameter, *branchlets* and twigs minutely puberulent; *lvs.* 3-7-foliolate; *petioles* 5-12 cm. long, densely or sparsely puberulent, disc-shaped at the apex; *leaflets* sub-equal or the lowermost somewhat smaller, all distinctly petiolulate; *petiolules* 1-22 mm. long, margined and canaliculate above, puberulent beneath; *leaflet-blades* usually thin chartaceous or submembranous, the central one oblong-elliptic or elliptic, 7-26 cm. long, 2.5-11 cm. wide, acute or short acuminate (rarely obtuse or emarginate) at apex, entire or often subundulate along the margins, acute or attenuate at the base, glabrous and shiny (rarely more or less pulverulent) above, puberulent (especially on the larger venation) beneath, soon becoming glabrous and shiny; *infl.* axillary, paniculate, usually 11-30 cm. long, 3-5 cm. wide, many-flowered, composed of 5-8 pairs of opposite or subopposite long-stipitate, dichotomous and loosely spreading cymes; *peduncles* and rachis slender, often somewhat flattened, puberulent or subglabrate; uppermost sympodia usually much abbreviated, lowermost elongate; *pedicels* 1-3 mm. long, densely greyish-puberulent; *cal.* campanulate, 2-3 mm. long and wide, more or less puberulent, its rim 5-toothed, the teeth short, acute, mostly recurved; *cor.* blue, purple or violet, with a yellow spot, about 12 mm. long, more or less densely appressed-puberulent throughout outside, the lowest lobe conspicuously enlarged, pulverulent towards the apex within, sublanuginous at the base; *stam.* and *style* exerted from the corolla-tube; *frt.* oblong-ovate, about 10 mm. in diameter.

Trinidad: Anderson *s.n.*; Rio Claro (Herb. Trin. 11645, no date); Southern watershed reserve (Herb. Trin. 12166, 26.6.1929).

Rare, in southern districts.

From Grenada, Trinidad and Curacao to Venezuela, the Guianas and Brazil.

2. *V. capitata* Vahl

White fiddlewood
 Five-leaf fiddlewood

V. bignonioides H.B.K.

Griseb. Fl. 502; Marshall, Trees Trin. & Tob. 77: Moldenke, Lilloa 4. 325.

Small *tree*, up to 10 m. tall, *branchlets* and twigs densely puberulent when young, glabrescent in age; *lvs.* 3- or 5-foliolate; *petioles* 3-6.5 cm. long, decidedly flattened above, puberulent; *leaflets* subequal or the two lowermost (on 5-foliolate leaves) much smaller, sessile or the central ones obscurely petiolulate with very short margined petiolules; *leaflet-blades* thin-chartaceous, the

central one elliptic, 3.5-14.5 cm. long, 2.3-3.5 cm. wide, long-acuminate or caudate at the apex, entire, acuminate at the base, practically glabrous on both surfaces (except sometimes on the larger veins beneath); *infl.* cymose, capitate (rarely subumbelliform), axillary, long-pedunculate, usually densely many-flowered (rarely few-flowered), 5.5-12 cm. long, 1.5-3.5 cm. wide, rarely branched; *peduncles* slender, 4.5-9.5 cm. long, decidedly flattened, often sulcate, puberulent like the petioles, less so in age; *pedicels* 1-2 mm. long, puberulent, up to 6 mm. long in fruit; *cal.* campanulate, 1-2 mm. long and wide, strigillose-puberulent, its rim subtruncate, often repand-denticulate; *cor.* blue, 10-12 mm. long, densely puberulent; *frt.* oblong, black, 12-14 mm. long, 8-9 mm. wide.

Trinidad: Hort. Trin. (Herb. Trin. 1946, 19.9.1888; Herb. Trin. 5499, 8.6.1894); Pitch Lake (Herb. Trin. 3033, 6.5.1868); Maraval (Dannouse s.n., March, 1902); Couva (Herb. Trin. 8933, March, 1902); Aripo rd. (11728, 5.6.1927); and many other collections in various herbaria.

Widely distributed and common in the drier forests; not recorded from Tobago.

Also known from Venezuela.

3. *V. divaricata* Sw.

Black fiddlewood, Bois lezard

Arrabidaea paniculata (Sieber) Seem.

Tanaecium? paniculatum Sieber

Griseb. Fl. 502: Urb. Symb. Ant. 4. 537: Britt. & Wils. Sci. Surv. Porto Rico 6. 149: Marshall, Trees Trin. & Tob. 77: Moldenke, Lilloa 4. 325.

Tree, up to 20 m. high, trunk up to 80 cm. in diameter, its bark separating in strips; *branchlets* and twigs rather sparsely puberulent when young, glabrescent in age; *lvs.* mostly 3-foliate (rarely 1- or 5-foliate); *petioles* 1-8.5 cm. long, flattened and shallowly channelled above, minutely puberulent; *leaflets* usually very unequal, the central one much larger than the lateral ones, all petiolulate; *petiolules* 1-8 m.m. long, flattened, margined, highly puberulent, the lateral usually considerably shorter than the central; *leaflet-blades* thin-chartaceous or membranous, the central one broadly oblong, oblong-elliptic or elliptic, 4.5-21.5 cm. long, 2.3-9 cm. wide, acuminate or short-caudate at the apex, entire, acuminate at the base, practically glabrate on both surfaces (except sometimes along the larger veins beneath); *infl.* axillary, cymose, divaricate, 5-14 cm. long, 2-9 cm. wide, usually 3 or 4 times dichotomous, each dichotomy widely spreading, usually about 6-31-flowered, the elongated cyme-branches slender and conspicuously flattened; *peduncles* flattened, 1.8-9.5 cm. long, minutely puberulent or glabrate; *pedicels* 1-3 mm. long, minutely puberulent or glabrate; *cal.* campanulate, about 2 mm. long and wide, its rim subtruncate; *cor.* violet or blue, 8-10 mm. long, densely puberulent; *fruit* obovoid-ellipsoid, black, 8-10 mm. long.

Trinidad: Broadway 2710 & 6636; Sieber Fl. Trin. 247; Crueger 34; Rd. to Blue Basin (Herb. Trin. 7722, 12.5.1915); St. Ann's (Herb. Trin. 11906, 3.7.1927); from cultivated trees (Herb. Trin. 3694 and 3782).

Tobago: Broadway 2863, 3521, 3984, and 4580; there is no specimen in Herb. Trin.

Nowhere common, but widely distributed in both wet and dry forests.

From Jamaica, throughout the West Indies to Venezuela.

12. CLERODENDRUM *Burm.*

Trees, shrubs or woody *climbers*, usually unarmed or rarely with the petiole-base spinescent, glabrous or variously pubescent. *Lvs.* simple, opposite, or whorled, entire or dentate, deciduous, exstipulate. *Inff.* determinate, the cymes usually loose-flowered, rarely dense-flowered, pedunculate in the upper leaf-axils, or paniculate at the apex of branchlets, or densely aggregated in terminal corymbs or heads. *Fls.* more or less irregular, often large and showy, usually white, blue, violet or red, the calyx often of the same colour as the corolla, or red, white or green. *Cal.* campanulate or rarely tubular, truncate and entire or 5-toothed or 5-parted, often accrescent, sometimes enclosing the fruit. *Cor.* salver-shaped, its tube narrowly cylindric, straight or incurved, sometimes considerably exceeding the calyx, limb spreading, 5-parted. *Stam.* 4, didynamous, inserted in the corolla-tube, long exserted; *anths.* ovate or oblong, 2-celled, with parallel thecae opening by longitudinal slits. *Style* terminal, elongate, shortly and acutely bifid at the apex. *Ovary* imperfectly 4-celled, each cell 1-ovulate. *Fruit* drupaceous, globose or ovoid, often 4-sulcate, or somewhat 4-lobed, the exocarp more or less fleshy, the endocarp bony or crustaceous, separating at maturity into 4 pyrenes, which sometimes cohere in pairs. *Seeds* oblong, without endosperm.

Petiole-base spinescent 1. *C. aculeatum*

Petiole-base not spinescent

Cor. greatly elongate, 10-12 cm. long; lvs.

ternate, narrowly oblong or elliptic,

glabrous on both surfaces 2. *C. indicum*

Cor. not elongate, 1.5-3 cm. long; lvs.

opposite, broadly ovate, strigillose-

pubescent on both surfaces 3. *C. fragrans* var.

pleniflorum

1. *C. aculeatum* (L.) Schlecht.

C. aculeatum (L.) Griseb.

Volkameria aculeata L.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 500: Urb. Symb. Ant. 8. 601: Britt. Fl. Berm. 317: Britt. & Millsp. Bah. Fl. 374: Britt. & Wils. Sci. Surv. Porto Rico 6. 150: Moldenke, Lilloa 4. 328.

Sprawling or trailing *shrub*, up to 3.5 m. high; *branches*, branchlets and twigs stiff, subterete or obtusely tetragonal, pubescent or puberulent, glabrate in age, lenticellate; *lvs.* opposite or ternate; *petioles* slender from a very stout, ligneous and ampliate base, 3-11 mm. long, more or less puberulent, eventually breaking off obliquely one-third or half the distance from the base, the base persisting as a sharp, subulate, stout spine; the petioles of the small fascicled leaves which are often borne in the axils of the spines obsolete or very short and not spine-scent; *leaf-blades* chartaceous, elliptic, 0.9-5.5 cm. long, 0.3-2.4 cm. wide, acute or cuneate at the base, entire, blunt, or acute at the apex and usually slightly mucronulate, glabrous or subglabrous and shiny on both surfaces, densely punctate beneath, the midrib sometimes puberulent beneath on young leaves; *infl.* axillary, crowded at the apex of the branchlets and twigs; cymes solitary in or slightly above the axils of the spines, 2-6 cm. long, 1.5-5 cm. wide, loosely and sparsely flowered; *peduncles* very slender, 1-2.8 cm. long, densely puberulent; *pedicels* 2-12 mm. long, densely puberulent; *cal.* campanulate, about 3 mm. long, puberulent, its rim 5-lobed, the lobes triangular-ovate, 2-3 mm. long, caudate-acuminate, spreading or reflexed; *cor.* salver-shaped, white, its tube slender, about 18 mm. long, its limb 5-lobed and about 12 mm. broad; *stam.* 4, somewhat unequal, purple, exserted; *fruiting-calyx* cupuliform, spreading, 3-5 mm. long, 6-9 mm. wide, puberulent or granular-pulverulent and punctate, its rim sharply 5-lobed, deeply split in age; *fr.* subspherical 5-9 mm. long and wide, glabrous, conspicuously 2-lobed and sulcate when young, in age 4-lobed and 4-sulcate, fleshy when young, hard and stony when mature, splitting into two 2-lobed halves on maturity.

Tobago: roadside, Scarborough to farm (Herb. Trin. 11152, 6.6.1915); Fort Hall (Herb. Trin. 11834, 13.9.1927). Also cultivated in Trinidad and Tobago.

From eastern Mexico, Bermuda and the Bahamas, through the West Indies to northern Venezuela and the Guianas.

2. *C. indicum* (L.) Kuntze

Siphonanthus indica L.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 500: Britt. & Wils. Sci. Surv. Porto Rico 6. 151: Moldenke, Lilloa 4. 329.

Branching *shrub* or low *tree*, to 2 m. tall; *branchlets* very stout, hollow, subglabrate, the larger 8-10 sulcate; *lvs.* opposite or whorled in groups of 3-6; *petioles* stout, 4-8 mm. long, glabrous; *leaf-blades* membranous or thin-chartaceous, oblong or elliptic, 8.5-23 cm. long, 2.3-5.5 cm. wide, acute or acuminate at the apex, entire, acute at the base, glabrous on both surfaces, sparsely punctate beneath; *infl.* axillary and terminal, abundant, the axillary cymes solitary and opposite or whorled, usually supra-

axillary, 4-6 cm. long, few-flowered, loose, widely divaricate; terminal panicle thyrsoïd, up to 45 cm. long or longer, and up to 25 cm. wide, very showy, composed of 3-12 whorls of cymes, glabrous throughout; *peduncles* and sympodia similar to the branchlets in shape, texture and glabrescence; *bracts* foliaceous, resembling the leaves in all respects, but smaller, usually numerous, caducous; *bractlets* broadly linear, very numerous, 5-15 mm. long, 2-3 mm. wide, glabrous; *pedicels* slender, 6-17 mm. long, glabrous; *cal.* campanulate, somewhat fleshy, 1.3-2 cm. long, deeply 5-parted, lobes ovate, purplish, 6-10 mm. long, acute, usually rather longer than the broadly campanulate tube; *cor.* salver-shaped, white or yellow, tube very slender, greatly elongate, about 10 cm. long and 2 mm. diam., curved, ampliate at the apex, limb irregularly 5-lobed, much shorter than the tube, 2-3 cm. wide lobes oblong or obovate; *stam.* unequal, exserted; *frt.* blue-black, globose, fleshy, shorter than the persistent calyx-lobes, 8-10 mm. wide, 2-4 lobed, usually with 5 pyrenes.

Trinidad: Princes Building (*s.n.*, 23.10.1906); Arima (Herb. Trin. 10459, 4.3.1921); Tredholm *s.n.*

Tobago: Botanic station (Broadway *s.n.*); Broadway 3372; Eggers 5500.

An Asiatic species widely cultivated; naturalized from the southern United States, throughout the West Indies, to Trinidad and the Guianas.

3. *C. fragrans* var. *pleniflorum* Schau.

C. fragrans Willd.

For detailed synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 500: Britt. Fl. Berm. 318: Britt. & Millsp. Bah. Fl. 375: Britt. & Wils. Sci. Surv. Porto Rico 6. 150: Moldenke, Lilloa 4. 330.

Subshrub, up to 1.5 m. high, usually reproducing vegetatively, *branches* and *branchlets* short-pubescent; *lvs.* opposite, large; *petioles* 2-23.5 cm. long, more or less densely short-pubescent (less so in age), usually collapsing at the base and apex in drying; *leaf-blades* membranous, broadly ovate, 6-29 cm. long, 5-28 cm. wide, sharply acute at the apex, coarsely and irregularly dentate, cordate or subtruncate at the base, lightly strigillose-pubescent on both surfaces, usually more densely so on the veins beneath; *infl.* terminal, cymose, very densely many-flowered, subsessile or short-pedunculate, 3-6 cm. long, 3.5-9 cm. wide, often subtended by a pair of long-stipitate foliaceous bracts; *bractlets* very numerous, foliaceous, scattered throughout the cymes, oblong or elliptic, 1.5-3 cm. long, 3-12 mm. wide, subulate-acuminate at the apex, attenuate-acute at the base, more or less strigillose-pubescent on both surfaces, especially at the margins, long-stipitate; *cal.* campanulate, 1-1.5 cm. long, purple or red, with scattered circular or

elliptic glandular discs, sparsely strigillose-puberulent or glabrate, 5-cleft, its lobes lanceolate, 4-10 mm. long, sharply acuminate; *cor.* salver-shaped, more or less full-double, white, pink or rose; *stam.* and *pistil* usually modified into supernumerary petals; *frt.* not developed, except in rare instances.

Trinidad: Fendler 1013; St. Joseph (Herb. Trin. 4724); Herb. Trin. 6532; Morne Coco rd. (Herb. Trin. 14250, 1.1.1948).

An Asiatic plant very widely cultivated in all subtropical and tropical regions, where it quickly becomes naturalized.

FAMILY 3. AVICENNIACEAE

BY HAROLD N. MOLDENKE

Shrubs or *trees* of maritime regions mostly inhabiting brackish coastal swamps; *branches, branchlets* and twigs commonly terete, prominently nodose, articulate. *Leaves* opposite, thick-textured, persistent, petiolate, exstipulate, simple, the blades entire. *Inflorescence* axillary or terminal, determinate and centrifugal (cymose), spicate or subcapitate. *Flowers* sessile, perfect, hypogynous, small. *Calyx* of 5 nearly separate sepals, ovate and imbricate, subtended by a pseudo-involucre of a scale-like bractlet and two alternate scale-like prophylla, which are slightly shorter than the calyx, and imbricate with each other and with the calyx-segments. *Corolla* regular, gamopetalous at the base, campanulate-rotate, 4-parted. *Stamens* 4, inserted in the corolla-tube, equal or subdidynamous. *Carpels* 2, united. *Ovary* compound, but with a free central often more or less 4-winged placenta. *Ovules* 4, pendent, orthotropous, hanging from the tip of the central columella. *Fruit* a compressed oblique capsule, somewhat fleshy, opening by 2 valves, by abortion regularly 1-seeded. *Seeds* without a testa, embryo viviparous.

1. AVICENNIA L.

This genus is often placed in the Verbenaceae, when the family characters given above would be those of the genus.

Corolla-lobes tomentose on both surfaces;
 leaf-blades usually sharply acute
 at the apex1. *A. nitida*

Corolla-lobes glabrous above; leaf-blades
 usually rounded at the apex2. *A. schaueriana*

1. *A. nitida* Jacq.

Black mangrove

For synonymy see Moldenke (*loc. cit.*)

Griseb. Fl. 502: Urb. Symb. Ant. 4. 539; 8. 603: Britt. Fl. Berm. 320: Britt. & Millsp. Bah. Fl. 375: Britt. & Wils. Sci. Surv. Porto Rico 6. 151: Marshall, Trees Trin. & Tob. 75: Moldenke, Lilloa 4. 334.

Tree, up to 16 m. tall, branchlets and twigs slender, grey or brownish, more or less tetragonal, glabrous, often shiny; *petioles* rather slender, 2-27 mm. long, mealy or glabrous; *leaf-blades* firmly chartaceous or subcoriaceous, dark or grey-green and very shiny above, usually of the same colour beneath, but the lamina obscured by a very dense, whitish scurf so as to impart a bicolored

appearance to the leaves, occasionally brunnescient or nigrescent on drying (especially when the scurf is absent), oblong, lanceolate, elliptic, or obovate, 4.5-15 cm. long, 1.8-4.4 cm. wide, mostly acute (sometimes obtuse) at the apex, acute, acuminate or cuneate at the base, glabrous, but densely impressed-punctulate above, varying from uniformly densely whitish- or greyish-farinaceous with very closely appressed scurf to glabrous and more or less punctate beneath, the scurf deciduous in patches in some cases; *infl.* axillary and terminal, spikes 1.5-6.5 cm. long, 1-1.5 cm. wide in anthesis, the axillary usually confined to a single pair at the base of the terminal and shorter than it, or a single pair in the next lower leaf-axils; *fls.* usually opposite, 1-15 pairs per spike, sessile, usually closely crowded; *bractlets* and prophylla ovate or oblong, sessile, closely appressed to the calyx, obtuse or acute, densely sericeous-pubescent with cinereous appressed hairs outside; *cal.* with ovate lobes 3-5 mm. long, 2-3 mm. wide, densely appressed pubescent outside, glabrous within; *cor.* white, 12-20 mm. long, parted to about the middle, the tube equalling or shorter than the calyx, practically glabrous, the lobes 2-2.5 mm. long, oblong or subquadrate, spreading, densely cinereous-pubescent outside with appressed hairs, velutinous-tomentose within; *stam.* slightly exerted from the corolla-tube, included by the lobes; *fruit* more or less obpyriform or ovate and asymmetric, 1.2-2 cm. long, 7-12 mm. wide, apiculate at the apex when immature, densely white or grey-pulverulent throughout, often also more or less appressed-strigose at the apex.

Trinidad: There are many specimens in Herb. Trin. from Monos, Caroni swamp, Pointe-a-Pierre, Cocorite, Erin, Moruga, Toco, &c.

Tobago: Broadway 3786; Eggers 5897.

Coastal brackish swamps, common.

From southern United States to the Guianas and Brazil.

2. *A. schaueriana* Stapf & Leechman White Mangrove

A. tomentosa Jacq. *sensu* Schauer in DC. Prod. 11. 699.

A. nitida var. *trinitensis* Moldenke

Stapf & Leechman in Moldenke, Lilloa 4. 336: Marshall, Trees Trin. & Tob. 75 (as *Avicennia* sp.).

Tree, up to 16 m. high, *branchlets* and twigs slender, mostly dark brown or nigrescent, mostly subterete, glabrous and shiny; *petioles* rather slender, 2-20 mm. long, mealy or glabrous; *leaf-blades* firmly chartaceous or subcoriaceous, dark green above and decidedly brunnescient or nigrescent on drying, dull, elliptic, oblanceolate or obovate, 1.7-8.2 cm. long, 1.1-3.8 cm. wide, mostly obtuse or rounded at the apex, usually cuneate at the base (rarely merely acute), mostly glabrous and densely impressed-punctate above (rarely more or less densely pulverulent) varying from

densely greyish-farinaceous to glabrous and impressed-punctate beneath; *infl.* axillary and terminal, *spikes* 2.5-6.5 cm. long, 1-1.5 cm. wide in anthesis, the axillary usually confined to a single pair at the base of the terminal one and shorter than it; *fls.* opposite, sparse, only 1-5 pairs per spike, sessile, the pairs usually distant, the lowermost pair frequently subtended by a pair of foliaceous stipitate bracts resembling miniature leaves; *bractelets* and prophylla ovate, sessile, obtuse or acute, densely appressed-pubescent; *cal. cor.* and *fruit* similar to the preceding species except that the corolla-lobes are glabrous within.

Trinidad: Britton 2595 (in part); Broadway 5817; Moros (Herb. Trin. 2402, Feb. 1867); Blue River (Herb. Trin. 5221, 16.1.1893); Cocorite (Herb. Trin. 7988, 26.7.1912 and Herb. Trin. 8695, Sept. 1918); Monkey Point (Herb. Trin. 10461, Mar. 1927); Caroni Swamp (Herb. Trin. 12651, 9.5.1932 and Herb. Trin. 12656, 29.5.1932).

Coastal brackish swamps.

From Martinique and Grenada to southern Brazil and Uruguay.

FAMILY 4. LABIATAE

BY R. E. D. BAKER*

Herbs or *subshrubs*, rarely shrubs. *Stems* usually square. *Leaves* opposite or whorled, simple, without stipules, entire, toothed, or variously dissected, often hairy, and with epidermal glands secreting volatile oils. *Inflorescences* sometimes of terminal simple racemes, more frequently of more or less condensed axillary cymes, or of false whorls (*verticillasters*) formed by the overlapping of the two condensed cymes at each node; the verticillasters sometimes in the axils of unreduced leaves, sometimes themselves forming terminal spikes or racemes or heads by reduction of the leaves in the flowering region to bracts. *Flowers* hermaphrodite, irregular. *Calyx* gamosepalous, tubular, bell-shaped or funnel shaped, usually 5-toothed or 5-lobed, sometimes 2-lipped, persistent in fruit. *Corolla* gamopetalous, the tube short or long, the limb usually 2-lipped, often without clear indication of the individual petals. *Stamens* 4, didynamous or nearly equal, sometimes 2, borne on the tube of the corolla. *Ovary* of 2 carpels, but deeply 4-lobed; *ovules* 1 in each lobe; *style* arising between the lobes from the base of the ovary, slender; *stigma* 2-lobed. *Disc* often present below the ovary, often fleshy, sometimes developed into 4 glandular lobes alternating with the lobes of the ovary, sometimes developed on the anterior side only. *Fruit* usually splitting into 4 single-seeded indehiscent *nuts* (or by imperfect development less than four), commonly dry, rarely fleshy or a drupe.

The family, on account of its aromatic volatile oils, yields condiments and perfumes. *Mentha* spp. (mint) and *Thymus vulgaris* L. (thyme) are grown in the Colony as pot herbs, and species of *Coleus*, *Salvia* and *Scutellaria* occur in flower gardens.

Stamens declined towards the lower lip of
the corolla

Cal. distinctly 2-lipped, the posterior tooth
larger than the others

Lower lip of corolla scarcely longer
than the upper1. *Ocimum*

Lower lip of corolla much longer than
the upper2. *Coleus*

*I am indebted to Dr. Carl Epling of the University of California for critically examining our herbarium material and for preparing notes on the species; also to Mr. N. Y. Sandwith for much helpful advice.

- Cal. scarcely 2-lipped, its teeth nearly equal
- Fruiting calyx bell-shaped; nutlets with a membranous margin3. **Marsypianthes**
- Fruiting calyx elongated-tubular; nutlets not margined4. **Hyptis**
- Stamens ascending under the upper lip of the corolla
- Stamens 25. **Salvia**
- Stamens 4
- Lvs. deeply dissected; fls. pink.....6. **Leonurus**
- Lvs. toothed, not dissected; fls. orange ..7. **Leonotis**

1. OCIMUM L.

Shrubs or herbs. Fls. commonly in whorls of six, subtended by usually deciduous bracts, disposed in short but not dense spikes, the pedicels ascending-recurved. Cal. 10-veined, strongly bilabiate, the uppermost tooth subrotund and more or less decurrent upon the tube, usually concave at maturity, the lowermost pair free or united, curving and frequently closing the tube. Cor. upper lip 4-lobed, the lobes equal, more or less connate, the lowermost lobe usually plane. Stam. declined, curving, the posterior seated at the base of the tube, naked, or bearing an appendage. Nutlets obovate, usually covered with a pellicle on wetting.

1. **O. micranthum Willd.**

Mosquito Bush

Griseb. Fl. 487: Urb. Symb. Ant. 4. 545; 8. 614: Britt. & Millsp. Bah. Fl. 380: Kostermans in Pulle, Fl. Surin. 4. 1. 337.

An erect *herb* as much as a metre tall, its branches cymose-divaricate; *leaf-blades* generally 4-5 cm. long, usually ovate, acute at the apex, rounded at the base and narrowed to petioles 1-2 cm. long, both surfaces glabrous, their margins sub-entire; *fls.* subtended by ovate deciduous bracts, the whorls 0.5-1.5 cm. distant; *cal.* 2.5 mm. long at anthesis, borne on pedicels somewhat longer, enlarged at maturity, the upper tooth decurrent to the base of the tube, 7-8 mm. long; *cor.* white, purplish within, 3-4 mm. long; *stam.* about equal to the corolla, their filaments unappendaged; *nutlets* about 1 mm. long.

Trinidad: La Ventille (Herb. Trin. 943, 2.8.1846); *sine loc.* (Herb. Trin. 2745); Pointe Gourde (*s.n.* 31.3.1921); Morne Coco rd. (Herb. Trin. 14252, 1.1.1949); *sine loc.*, Fendler 559 in Herb. Kew.

Tobago: Miford (*sic*) Main Rd. (Herb. Trin. 11455, 28.10.1925); Bacolet (N. Y. Sandwith 1612, 5.10.1937, in Herb. Kew); *sine loc.* (H. Millen, Sept, 1903 in Herb. Kew).

Roadsides and waste places, probably introduced.

Tropical South America.

Two other species, *O. americanum* L. and *O. sanctum* L. are represented in the Trinidad Herbarium, the latter being known as 'Toonsie' and said to be of religious importance to certain East Indians. Neither species is commonly cultivated or widely naturalized.

2. COLEUS Lour.

Herbs (the local species) with broad dentate leaves and small blue or lilac flowers in whorls, subtended by reflexed or deciduous bracts, disposed in terminal racemes; *cal.* ovoid-bell-shaped, usually declined or reflexed in fruit, strongly 2-lipped, the uppermost tooth ovate and larger than the others, rarely decurrent upon the tube, the lowermost pair acute; *cor.* upper lip bluntly 3-4-lobed, the lower elongated, entire, usually concave; *stam.* declined, filaments shortly joined at the base into a tube free from the corolla; *nullets* ovoid or rather broad and smooth.

Two species are found fairly commonly in damp shady places, often under cacao, as escapes from cultivation. Numerous garden varieties of *C. blumei* Benth. are cultivated in the Colony for their coloured leaves.

Large upright herb, leaf-blades up to at least

15 cm. long and 10 cm. broad, somewhat wedge-shaped at the base, lower lip of corolla shallow

1. *C. blumei*

Smaller decumbent herb, leaf-blades usually

about 6 cm. long and broad or less, truncate at the base, lower lip of corolla deeper

2. *C. atropurpureus*

1. *C. blumei* Benth.

Britt. & Wils. Sci. Surv. Porto Rico 6. 160.

Large herb, up to 1 m. tall, the branches slender, puberulent or glabrate; *lvs.* green, purplish, red, yellow or mottled, ovate to orbicular-ovate, 6-15 cm. long and 5-10 cm. broad, coarsely dentate or incised, the teeth rounded, bluntly acute or acuminate at the apex, the bases narrowed, obtuse or rounded, the petioles 1-4 cm. long; *fls.* in terminal, loose, more or less pubescent racemes, each whorl usually composed of 2 basal flowers and four short branches each with 3-6 flowers; *pedicels* 1.5-2.5 mm. long; *cal.* 2 mm. long at anthesis, markedly accrescent; *cor.* blue or mauve, the tube 5 mm. long, curved, white, the upper lip short, the lower lip shallow, boat-shaped, 5 mm. long, blue or mauve.

Trinidad: Cedros (s.n. Broadway, May, 1915); Aripo rd. 7th mile (Herb. Trin. 13389, 10.4.1939); Tucuche trail above Orinola (Herb. Trin. 14217, 18.4.1948); Aripo valley (Herb. Trin. 14381, 30.5.1949); Guaico-Tamana rd. (Herb. Trin. 14983, 7.5.1953); Tamana (Broadway 5602, 27.3.1925, in Herb. Kew).

Damp shady places, roadsides, and under cacao.

Native of Indonesia, introduced into the West Indies and commonly cultivated.

2. *C. atropurpureus* Benth.

Sandwith in Kew Bull. 1938, 373 (as *C. blumei* auct.)

Trailing herb, smaller than the preceding species, pubescent; *lvs.* variously coloured, up to 6 cm. long and broad, often much smaller, coarsely toothed, the teeth rounded, bluntly acute at the apex, usually truncate at the base, pubescent on both surfaces, slightly decurrent into the petioles which are up to 6 cm. long; *fls.* in terminal racemes, their structure as in the preceding species but the branches at each whorl longer, up to 2.5 cm., and few to many flowered, pubescent; *cal.* about 2 mm. long at anthesis; *cor.* blue or violet, the lower lip deeper than in *C. blumei*; in Trinidad the flowers usually fall early and fail to set seed, reproduction being apparently entirely vegetative.

Trinidad: San Rafael (Herb. Trin. 13267, 2.2.1938); end of Cumaca rd. 9th mile (Herb. Trin. 14173, 1.2.1948); Aripo valley (Herb. Trin. 14430, 11.10.1949).

Tobago: Roxborough-Parlatuvier rd. (Sandwith 1921, 25.10.1937, in Herb. Kew).

Damp shady places, often under cacao.

A naturalized alien, native of Malaya and Indonesia.

3. MARSYPIANTHES Mart.

Herbs, usually prostrate and viscid, with rather small leaves. *Fls.* few in small axillary heads. *Cal.* top-shaped or bell-shaped, teeth 5, triangular-acuminate, equal, more or less joined after flowering. *Cor.* tube straight, cylindrical, the middle lobe of the lower lip deeply pouched. *Stam.* 4, free, declined. *Nutlets* hemispherical, concave on the inner face, their margins membranous, strongly involute and more or less lacerate.

1. *M. chamaedrys* (Vahl) Kuntze

M. hyptoides Mart.

Clinopodium chamaedrys Vahl

Griseb. Fl. 487: Urb. Symb. Ant. 4. 544: Kostermans in Pulle, Fl. Surin. 4. 1. 339: Britt. & Wils. Sci. Surv. Porto Rico 6. 160.

Much-branched procumbent herb, branches 30-60 cm. long, viscid-pubescent; *lvs.* generally oblong-ovate, *petioles* 0.5-1.5 cm., *blades* up to 5 cm. long, 2.5 cm. wide, blunt at apex, subtruncate or wedge-shaped at base, coarsely toothed, both surfaces sparingly villous and usually more or less viscid; *heads* hemispherical, sessile

or on *peduncles* up to 3 cm. long, subtended by narrowly-lanceolate hairy bracts about as long as the calyces; *cal.* in flower 4-5 mm. long, the *teeth* triangular-ovate, acuminate, purplish, 1.5-4 mm. long, the tube 3-5 mm. long at maturity; *cor.* violet, its tube about 5 mm. long, the limb 4 mm. across, paler in the throat; *nutlets* brown, 1.5 mm. long.

Trinidad: Fort George (*s.n.* 28.2.1847); Maracas (*s.n.* 2.5.1904); Reservoir (*s.n.* 8.9.1906); Cedros (Herb. Trin. 7184, 15.9.1915); Cedros (Herb. Trin. 8534, 2.11.1916); Moruga (Herb. Trin. 10467, 19.3.1921); Lopinot rd. 3½ mi. (Herb. Trin. 13343, 16.4.1938); La Veronica, Caura (Herb. Trin. 13239, 1.12.1937); Aripo road near 1st mile post (Broadway 5890, 15.1.1926, in Herb. Kew); St. Ann's (Crueger, 16.7.1852, in Herb. Kew).

Roadsides and grassy places, Trinidad.

West Indies and tropical continental America.

4. *HYPTIS* Jacq.

Herbs of varied habit, generally suffruticose. *Fls.* in capitula or cymules (pectinate in one species) which are disposed in the axils of diminished leaves, rarely congested into spikes. *Cal.* 10-veined, usually turbinate at flowering and enlarged in some degree at maturity, often recurved at the orifice, either naked within or annulate above the nutlets both inside and out, the teeth sub-equal. *Cor.* tubular, naked within, the upper lip emarginate, erect, the middle lobe of the lower deeply saccate. *Stam.* 4, declined. *Nutlets* generally obovate or ovate, rounded at the apex.

Inflorescences compactly globose-capitate,
involucrate

Peduncles, at least the lower ones, equal
to or longer than the capitula

Peduncles usually 2 or more times as
long as inflorescence

Savanna plants with heads less than
15 mm. in diameter

Leaves cordate or rounded at base,
petiolate, tubes of mature calyces
sigmoid1. *H. recurvata*

Leaves tapering at base, subsessile,
tubes of mature calyces straight5. *H. lantanifolia*

Weedy herb with inflorescences
commonly 15-25 mm. in diameter..6. *H. capitata*

Peduncles 1½ or less times as long as
the capitula

Leaves not lobed

Diffuse procumbent herb, leaves up
to 35 mm. long, crenate10. *H. atrorubens*

- Erect herb, leaves 40-70 mm. long,
 acutely serrate, hirtellous9. *H. lanceolata*
 Leaves shallowly lobed, hirsute7. *H. sinuata*
 Peduncles much shorter than the subsessile
 inflorescences8. *H. brevipes*
 Inflorescences more racemose, the flowers
 often clustered and sessile, but not
 in globose capitula
 Leaf-bases not cordate, calyx teeth slender,
 ca. 1 mm. long
 Lamina tapering to petiole, bracts
 elliptical-ovate4. *H. mutabilis*
 Lamina making acute angle with petiole,
 bracts linear-setaceous2. *H. pectinata*
 Leaf-bases cordate, calyx teeth robust,
 3 mm. long3. *H. suaveolens*

1. *H. recurvata* Poit.

H. recurvata var. *hirsutior* Benth.

H. recurvata var. *grandifolia* Benth.

H. microcephala Bert. ex. Benth.

Mesosphærum recurvatum (Poit.) Kuntze

Epling in Fedde, Repert. 34. 88: Kostermans in Pulle, Fl. Surin. 4. 1. 343.

Herb. erect, branching, up to 1.5 m. tall, thinly villous hirsute throughout; *lvs.* 2.5-9 cm. long, 2-7 cm. broad, ovate, acute, the lowermost rounded-cordate at the base, their margins irregularly serrate, borne on *petioles* 1-4 cm. long; *fls.* in dense globose capitula about 1 cm. diam. at maturity, borne on slender peduncles 2-4 cm. long; *bracts* linear-setaceous, 5-8 mm. long; *cal.* about 3 mm. long at anthesis, hispidulous, the teeth about equalling the tube, setaceous; *mature calyces* 5 mm. long, patently recurved towards the orifice, the teeth unchanged; *cor.* tube 3 mm. long; *nullets* roughened.

Trinidad: Piarco savanna (Herb. Trin. 9619, 15.3.1921); Piarco savanna (W.E. Broadway 7143, 10.3.1929, in Herb. Kew); Mausica savanna (Herb. Trin. 13344, 30.10.1938); Erin savanna (Herb. Trin. 13698, 5.9.40).

Savannas, not common.

Tropical South America.

2. *H. pectinata* (L.) Poit.

Nepeta pectinata L.

Griseb. Fl. 489: Urb. Symb. Ant. 4. 453; 8. 611: Britt. & Millsp. Bah. Fl. 380: Britt. & Wils. Sci. Surv. Porto Rico 6. 159.

Herb., 1-3 m. tall, pubescent throughout; *lvs.* variable in form and size, commonly 5-6 cm. long, ovate, rounded at the base, the lower surface paler, the margins irregularly crenate-serrate, borne on *petioles* 1-3 cm. long; *cymules* lax, forking, pectinate, subtended by linear-setaceous bracts 1-4 mm. long, borne on peduncles 2-3 mm. long, often deflexed at maturity; *cal.* tube scarcely 1 mm. long at anthesis, 1.5-2.5 mm. at maturity, the teeth 1-1.5 mm. long; *cor.* tube 1.5 mm. long; *nutlets* black.

Trinidad: Toco (Herb. Trin. 9416, 18.3.1917); Chacachacare (Herb. Trin. 10863, 27.5.1925); Moruga (Herb. Trin. 11184, 19.3.1921); Aripo rd. 7th mile (Herb. Trin. 13377, 10.4.1939).

Tobago: *sine loc.* (Herb. Trin. 7995, 10.5.1912); Northside rd. (Herb. Trin. 11390, 24.10.1925); Goldsborough (Herb. Trin. 13506, 29.3.1940); Bacolet (N. Y. Sandwith 1620, 5.10.1937 in Herb. Kew); French Fort (Broadway 4664, 27.1.1913, in Herb. Kew).

Roadsides and waste ground, common.

Florida, West Indies, cont. trop. America and Old World Tropics.

3. *H. suaveolens* (L.) Poit.

Ballota suaveolens L.

Griseb. Fl. 489: Urb. Symb. Ant. 4. 543; 8. 611: Britt. & Millsp. Bah. Fl. 380: Britt. & Wils. Sci. Surv. Porto Rico 6. 158.

Herb., up to 3 m. tall with fistulose glandular-villous stems; *lvs.* mostly 5-10 cm. long, ovate, slightly cordate at the base or rounded, irregularly dentate or serrate, often ragged, more or less villous on both surfaces, borne on petioles as long as the blade or shorter; *fls.* commonly 3-5 in cymes on peduncles about as long as the calyces or shorter, such cymes paniced or congested into dense spikes; *cal.* 4-5 mm. long at anthesis, villous or hirsute-pilose, the teeth subulate, equalling the tube, the tube 5-7 mm. long at maturity; *cor.* tube 4-6 mm. long; *nutlets* compressed, truncate at the apex, covered with a gelatinous pellicle when moist.

Trinidad: *sine loc.* (Herb. Trin. 941, 2.2.1852); *sine loc.* (Herb. Trin. 5710, 1892); O'Meara savanna (Herb. Trin. 14700, 22.4.51); Windbelt Reserve (Herb. Trin. 15034, 3.1.1954).

Savannas and waste ground.

Greater and Lesser Antilles, continental tropical America and tropical Asia.

4. *H. mutabilis* (Rich.) Briq.

Nepeta mutabilis Rich.

Griseb. Fl. 488: Urb. Symb. Ant. 8. 611: Epling in Fedde, Rept. 34. 103: Kostermans in Pulle, Fl. Surin. 4. 1. 344.

Herb. erect, polymorphic, 1-2 m. tall, glabrous or pubescent, the angles of the stem often scabrous; *lvs.* usually 3-6 cm. long, 2.5-4 cm. broad, generally either rhomboid-ovate or ovate, rounded and narrowed at the base, or cuneate, less often sub-cordate, either glabrous or hirtellous, rarely canescent, borne on *petioles* 1-4 cm. long; *fls.* 5-25 in small capitula subtended by and partly enclosed by the elliptical-ovate bracts, borne on peduncles 1-4 mm. long, the capitula usually 1-2 cm. distant; *cal.* 1.5-2 mm. long at anthesis, short-villous toward the base, the teeth 0.8-1.2 mm. long, the tubes 4-6 mm. long at maturity, cylindrical; *cor.* tube 3-4 mm. long, pale violet; *nutlets* ellipsoid, smooth, 1-1.5 mm. long.

Trinidad: Hort. Trin. (Herb. Trin. 2983 and 3412, 19.11.1888 and 12.1.1889); Icacos (Herb. Trin. 7403, 17.11.1915); Icacos (Broadway 9087, 6.12.1932 in Herb. Kew); W. G. Freeman 16.10.1917; Teteron Bay (N. L. Britton 493, 11.3.1920 in Herb. Kew); *sine loc.*, Fendler 562, in Herb. Kew.

Tobago: Goldsborough (Herb. Trin. 13506, 29.3.1940); Windward rd. (Herb. Trin. 15156, 20.4.1954); Plymouth (Herb. Trin. 14949, 4.5.1953).

Roadsides and waste ground, not uncommon.

Tropical South America, introduced into Europe.

Note: Two varieties have been described from Trinidad material, var. *spicata* (Poit.) Briq. and var. *canescens* (H.B.K.) Briq.; but as, according to Epling, they have no botanical significance, and, according to Sandwith, they are both illegitimate, necessitating new combinations if adopted, they will not be considered here.

5. *H. lantanifolia* Poit.

Mesosphaerum lantanifolium (Poit.) Kuntze

H. lantanifolia var. *glabrescens* Griseb.

H. lantanifolia var. *glabra* Kosterm.

Griseb. Fl. 488: Urb. Symb. Ant. 4. 542; 8. 611: Epling in Fedde, Repert. 34. 117: Kostermans in Pulle, Fl. Surin. 4. 1. 348: Britt. & Wils. Sci. Scurv. Porto Rico 6. 158.

Herb. decumbent or prostrate, often with numerous stems from a woody crown, stems often rooting at the nodes, appressed hirsute or silky, rarely glabrate; *lvs.* 1.5-6 cm. long, 0.8-2.5 cm. broad, usually 2-3 cm. long, ovate or rhombic-ovate, sometimes elliptical, obtuse at both ends, rounded and narrowed at the base, nearly sessile, crenate-serrate, usually hairy on both sides; *capitula* 12-20 mm. diam. at maturity; *bracts* ovate 5-8 mm. long, borne on appressed-hirsute peduncles 2-7 cm. long; *cal.* tubes 4-5 mm. long at maturity; *cor.* tubes 4-5 mm. long, white; *nutlets* ovoid, slightly compressed, smooth, 1.5 mm. long.

Trinidad: Aripo savanna (Herb. Trin. 2738, 19.5.1868); Aripo savanna (Herb. Trin. 5338, Mar. 1893); Guapo (s.n. 5.3.1899); Fort George (s.n. June, 1901); O'Meara savanna (Herb. Trin. 9342, 8.4.1920); Aripo savanna (Herb. Trin. 10670, 1.12.1922); O'Meara savanna (18.12.1922); Erin savanna (Herb. Trin. 13761, 13698, 5.9.1940); Piarco savanna (Herb. Trin. 13346, 30.10.1938); St. Joseph savanna (Herb. Trin. 13983, 14.12.1947); Long Stretch (Herb. Trin. 14182, 22.2.1948); St. Joseph (Crueger, 13.2.1848, in Herb. Kew); Valencia (Eggers 1385, Oct. 1883, in Herb. Kew).

Savannas, common.

Cuba, Hispaniola, Puerto Rico and continental tropical America.

Note: The following specimens, all in Herb. Kew, are referred to the var. *glabrescens* Griseb.; Piarco savanna, Crueger 14, 12.8.1858 and Broadway 2134; Aripo savanna, Broadway 7657; *sine loc.* Lockhart, Fendler 1015. Epling does not recognise this variety which was distinguished by the lower leaves being shortly petioled instead of sessile and glabrescent beneath.

6. *H. capitata* Jacq.

Mesosphaerum capitatum (Jacq.) Kuntze

Griseb. Fl. 488: Urb. Symb. Ant. 4. 542; 8. 610: Britt. & Wils. Sci. Surv. Porto Rico 6. 158.

Herb., erect, 1-2 m. tall, stems glabrate with thinly-appressed hairs towards the tips; *lvs.* commonly 8-12 cm. long, ovate, rounded at the base and narrowed to *petioles* 1-3 cm. long, the uppermost often subsessile, margins irregularly serrate, often subsessile, margins irregularly serrate, often ragged, both sides sparingly appressed-hirsute; *capitula* globose at maturity, 2-2.5 cm. diam.; *bracts* ovate-lanceolate, 5-7 mm. long, often completely obscured at maturity, on peduncles 2.5-6 cm. long; *cal.* tubes 8-10 mm. long at maturity, sparingly villous, the teeth 1.5 mm. long, nearly straight, *cor.* tube 2.5-3 mm. long; *nutlets* ellipsoid smooth, about 1 mm. long.

Trinidad: *sine loc.* (Herb. Trin. 2740, 7.12.1864); Hort. Trin. (Herb. Trin. 3434, 17.1.1889); Hort. Trin. (Herb. Trin. 4425, 16.12.1890); Princes Town (Herb. Trin. 4442, 20.12.1890); Maracas (Dannouse, 2.5.1904); Erin (Herb. Trin. 9126, 11.5.1920); Tamana (Herb. Trin. 9428, 14.1.1915); Siparia (Herb. Trin. 9429, 1918); Palo Seco (Herb. Trin. 10880, 31.12.1924); Aripo rd. 7th mile (Herb. Trin. 13378, 10.4.1939); Maraval (Broadway 7064, 9.12.1928, in Herb. Kew, and 9355, 5.1.1934, in Herb. Kew).

Tobago: Mt. St. George-Castara rd. 5th mile (Herb. Trin. 13521, 31.3.1940).

Waste ground and second growth, common.

Greater and Lesser Antilles, continental tropical America and Malaya.

7. *H. sinuata* Pohl ex Benth.

Mesosphaerum marrubiastrum Kuntze

Benth. Lab. Gen. et Sp. 103 (1833): Kuntze, Rev. Gen. 2. 525 (1891).

Herb., erect, 1-1.5 m. tall, the stems more or less coarsely hairy; *lvs.* 6-8 cm. long, 4-5 cm. broad, the lower twice as large, broadly ovate, truncate at the base and abruptly attenuate to the petioles, which are usually margined and 2-10 cm. long, even hastate, their margins irregularly sinuate and crenate, often ragged, both surfaces coarsely hairy; *capitula* globose at maturity, 15-20 mm. diam., bracts linear-lanceolate, 10-12 mm. long, borne on villous peduncles 1-3 cm. long; *cal.* tubes 4-7 mm. long at maturity, the teeth rarely as much as 2 mm., very acute; *cor.* tubes 4.5-6 mm. long.

Trinidad: Vivier Estate (Crueger, Herb. Trin. 942, 28.12.1845 also in Herb. Kew); Caroni savanna (Herb. Trin. 2737, 8.5.1868); Diego Martin (Herb. Trin. 8365, 26.8.1916).

Waste and cultivated ground; not common or recently collected.

Tropical South America.

8. *H. brevipes* Poit.

H. melanosticta Griseb.

Griseb. Fl. 488: Epling in Fedde, Repert. 34. 114: Kostermans in Pulle, Fl. Surin. 4. 1. 347.

Herb., slender, erect 30-60 cm. tall, their stems acutely quadrate, appressed hirsute in the upper parts, especially along the angles, the internodes 5-8 cm. long; *lvs.* usually elliptical-lanceolate, 4-6 cm., rarely up to 9 cm. long, 1.5-2 cm., rarely 3 cm. broad, tapering towards the apex and cuneate-attenuate at the base to an obscure margined petiole, their margins irregularly doubly serrate, both surfaces sparingly and laxly hairy; *capitula* globose at maturity, very dense, up to 15 mm. diam. borne on appressed-hirtellous peduncles 3-15 mm. long, subtended by narrowly lanceolate bracts 4-6 mm. long, these nearly occluded at maturity; *cal.* 2.5-3 mm. long at anthesis, the tubes at maturity 2-3.5 mm. long, sparingly hispidulous within, the teeth setaceous, very slender, mostly 1.5-2.5 mm. long; *cor.* tubes 2.5-3 mm. long; *nutlets* ellipsoid, smooth, less than 1 mm. long.

Trinidad: Caroni savanna (Herb. Trin. 936, 14.2.1847); Piarco savanna (Herb. Trin. 9621, 15.3.1921); Piarco savanna (Herb. Trin. 10465, 15.3.1921).

Savannas, not common.

Cuba and Northern S. America, introduced into Malaya and China.

9. *H. lanceolata* Poir.

H. globifera G.F.W. Meyer

Mesospaerum lanceolatum (Poir.) Kuntze

Epling in Fedde, Repert. 34. 11. 3: Kostermans in Pulle, Fl. Surin. 4. 1. 346.

Herb. erect, up to 1.5 m. tall, usually branched, the stems acutely quadrate, nearly glabrous or appressed-hirtellous, the internodes 5-8 cm. long; *lvs.* usually ovate-lanceolate, sub-rhomboid, 6-12 cm. long, 1.5-3 cm. broad, usually acute at the apex and cuneately narrowed at the base to an obscure margined petiole, both surfaces glabrate, or hirtellous along the veins beneath; *capitula* globose at maturity, 9-16 mm. diam., subtended by lanceolate bracts 4-8 mm. long, borne on appressed hirtellous peduncles 0.5-3.5 cm. long; *cal.* 3 mm. long at anthesis, the tube 3.5-4 mm. long at maturity, nearly glabrous, the teeth subulate, erect, usually 1-1.5 mm. long; *cor.* tube 2.5-3 mm. long; *nutlets* ellipsoid, black, smooth, hardly 1 mm. long, top often slightly acute.

Trinidad: O'Meara savanna (Herb. Trin. 9522); Piarco savanna (Herb. Trin. 9620, 15.3.1921); Piarco savanna (Herb. Trin. 10466, 15.3.1921); Piarco savanna (Herb. Trin. 14731, 29.1.1952); Churchill-Roosevelt rd. S. of I.C.T.A. (Herb. Trin. 15030, 30.11.1953); Guaico-Tamana rd. (Herb. Trin. 14986, 7.5.1953); Valencia rd. (Herb. Trin. 14861, 8.2.1953).

Savannas, roadsides, and waste ground.

Tropical South America, introduced into Africa.

10. *H. atrorubens* Poit.

Griseb. Fl. 488: Urb. Symb. Ant. 4. 542; 8. 610: Epling in Fedde, Repert. 34. 109: Kostermans in Pulle, Fl. Surin. 4. 1. 345: Britt. & Wils. Sci. Surv. Porto Rico 6. 158.

Herb. prostrate, creeping, often rooting at the nodes, stems spreading to 3 m.; *lvs.* 1.5-5 cm. long, 1-2.5 cm. broad, ovate, obtuse, rounded at the base, narrowing to *petioles* 0.5-1.5 cm. long, margins regularly crenate-serrate, sparingly hirsute with rather coarse hairs on both surfaces; *capitula* 8-10 mm. diam., with ovate bracts 4-6 mm. long, borne on slender peduncles 0.5-2.5 cm. long; *cal.* 4 mm. long at anthesis, the teeth shorter than the tube, setaceous, equal, strict, very acute, the tube 4-4.5 mm. long at maturity, rather thin and somewhat dilated, the teeth unchanged; *cor.* tube 4-5 mm. long, white with purplish-red spots; *nutlets* ovoid-globose, smooth, about 0.8 mm. long.

Trinidad: Hort. Trin. (Herb. Trin. 2168, 17.10.1888); Piarco (Herb. Trin. 9385, 28.1.1920); Morne Bleu (Herb. Trin. 9571, 27.1.1921); Mausica savanna (Herb. Trin. 13347, 30.10.1938); Erin savanna (Herb. Trin. 13761, 5.9.1940); Piarco savanna (Herb. Trin. 13348, 30.10.1938); Long Stretch (Herb. Trin. 14182, 22.2.1948); Brigand Hill (Herb. Trin. 14277, 13.3.1949) Pitch Lake (Broadway 9022, 25.9.1932. in Herb. Kew); Icacos (Broadway 9118, 6.12.1932, in Herb. Kew).

Tobago: Easterfield rd. (N. Y. Sandwith 1714, 11.10.1937, in Herb. Kew); Bacolet River (Eggers 5715 Nov. 1889, in Herb. Kew).

Savannas, roadsides, waste and cultivated ground; common.

Greater and Lesser Antilles, continental tropical America, tropical Africa.

5. SALVIA L.

Plants of diverse habit; flowers commonly six in whorls which are subtended by deciduous or persistent bracts and commonly disposed in interrupted spikes. *Cal.* bilabiate, the upper lip entire or 3-mucronate, 3, 5, 7 or 9-veined, the lower bidentate, the lips equal. *Cor.* tubular, strongly bilabiate, the upper lip entire or essentially so and helmet-shaped, the lower 3-lobed, spreading. *Stam.* 2, the connectives remarkably developed, the lower theca of each anther quite abortive. *Nutlets* obovate, smooth.

Corolla blue, its tube 2.5 mm. long1. *S. occidentalis*

Corolla red, its tube 13-17 mm. long2. *S. coccinea*

1. *S. occidentalis* Sw.

S. procumbens R. & P.

Griseb. Fl. 490: Urb. Symb. Ant. 4. 540; 8. 605: Britt. & Millsp. Bah. Fl. 378: Britt. & Wils. Sci. Surv. Porto Rico 6. 155.

Herb. annual, diffuse and usually procumbent, its branches 30-40 cm. long or more, either glabrous or hirtellous below, glandular among the flowers; *lvs.* 2-6 cm. long, broadly ovate and sub-rhomboid, somewhat acute, cuneately narrowed at the base to *petioles* 1 cm. long or less, crenate-serrate above the middle, the upper surface with scattered appressed hairs, the lower hirtellous, or both surfaces glabrous; *bracts* persistent, abruptly acuminate, 2-2.5 mm. long; *infl.* very slender, 10-20 cm. long; *cal.* 2 mm. long at anthesis, ovate-cylindrical, bristly with capitate glandular hairs, the upper lip truncate or obscurely trimucronate, mature calyces scarcely 3 mm. long, laterally compressed; *cor.* blue, the lower lip marked with white, the tube 2.5 mm. long; *nutlets* about 2 mm. long.

Trinidad: Hort. Trin. (Herb. Trin. 3401, 9.1.1889); North Post, Diego Martin (Herb. Trin. 5373, 9.4.1893); Port-of-Spain (*s.n.* 28.10.1906); Monos (Herb. Trin. 7453, 27.11.1915); Moruga (Herb.

Trin. 7587, 8.2.1916); Cedros (*s.n.* 31.11.1916); Mt. St. Benedict (Herb. Trin. 10958, 5.3.1925); Moruga Rd. 15½ mi. (Herb. Trin. 13272, 22.2.1938); Morne Coco rd. (Herb. Trin. 13263, 2.2.1938); coastal plain, Carenage (N. L. Britton & T. E. Hazen 5, 25.2.1920, in Herb. Kew); *sine loc.* (Fendler 558, de Shack, Lockhart, all in Herb. Kew).

Tobago: Lowlands (Herb. Trin. 13533, 28.3.1940).

Roadsides, waste and cultivated ground, common.

West Indies and continental tropical America.

2. *S. coccinea* Juss. ex Murr.

S. pseudococcinea Jacq.

S. ciliata Benth.

Griseb. Fl. 490: Urb. Symb. Ant. 4. 541: Britt. & Millsp. Bah. Fl. 379: Britt. Fl. Berm. 326: Britt. & Wils. Sci. Surv. Porto Rico 6. 156.

Herb., annual, up to 1 m. tall, stems pubescent with soft short hairs and generally bristly with larger spreading setae; *lvs.* deltoid-ovate, borne on *petioles* 1-3 cm. long, both surfaces more or less pubescent with short curled hairs and often sparingly setose, the lower surface sometimes incanous, their margins crenate-serrate; *fls.* subtended by whitish membranous usually deciduous bracts, disposed in interrupted spikes as much as 30 cm. long, crisp-hirtellous and often glandular, often reddish; *cor.* bright red, its tube 13-17 mm. long; *stam.* exerted 3-4 mm. beyond the corolla; *nutlets* 2.5 mm. long, slightly variegated.

Trinidad: Brasso (Herb. Trin. 10468, 25.3.1921); Morne Coco rd. (Herb. Trin. 13262, 2.2.1938); Lopinot valley (Herb. Trin. 14922, 6.4.1953); *sine loc.* (Fendler 567 in Herb. Kew).

Roadsides and waste ground; possibly confined to soils derived from limestone.

Southern United States, West Indies, continental tropical America.

6. LEONURUS L.

Erect *herbs* with deeply incised *leaves*. *Fls.* in dense whorls which are much surpassed by the reduced floral leaves. *Cal.* 5-veined, top-shaped, the teeth awl-shaped, spiny-tipped. *Cor.* tube with a ring of hairs within, the upper lip entire, the lower lip 3-lobed. *Stam.* ascending under the upper lip of the corolla. *Anth.* paired. *Nutlets* smooth, 3-angled, truncate at the apex.

1. *L. sibiricus* L.

Griseb. Fl. 491: Urb. Symb. Ant. 4. 540; 8. 605: Britt. & Millsp. Bah. Fl. 377: Britt. Fl. Berm. 324: Kostermans in Pulle, Fl. Surin. 4. 1. 351.

Erect *herb* 40-60 cm. high, thinly pubescent throughout; *stem* pubescent on the angles; *petioles* on basal leaves up to 10 cm. long, on upper leaves much shorter; lowermost *leaf-blades* roundish ovate in outline, obscurely 3-lobed, median leaves commonly 5-6 cm. long, exceeding their petioles, deeply incised, the diminished floral leaves similar or even becoming linear and entire, all thin and soft in texture; *fls.* sessile in hemispherical whorls usually 2 cm. or less in diameter, subtended by awl-shaped bracts; *cal.* 6-8 mm. long, the teeth shorter than the tube; *cor.* pink or rosy-purple, hairy, the tube 5-6 mm. long, the lips a little longer; *stam.* 4, close under the upper lip of the corolla and slightly shorter; *nutlets* 2 mm. long.

Trinidad: Hort. Trin. (Herb. Trin. 3555, 26.2.1889); St. Ann's (Herb. Trin. 9766, 27.3.1908); San Fernando (Herb. Trin. 11760, 14.4.1926); Dabadie (Herb. Trin. 13257, 14.1.1938); St. Joseph (Herb. Trin. 13342, 7.4.1938); San Fernando (Herb. Trin. 14168, 22.3.1939).

Roadsides and grassy places, Trinidad and Tobago (*vide* Urban, *l.c.*)

Native of Eastern Asia. Naturalized in the West Indies.

7. LEONOTIS R. Br.

Erect *herbs* or subshrubs. *Fls.* numerous, in dense spherical glomerules, which are solitary or 2-3 in an interrupted spike. *Cal.* 10-veined, tubular, recurved at the apex, oblique at the mouth, teeth commonly 8, the uppermost narrowly triangular and twice as large as the others, all spiny-tipped. *Cor.* tubular, the upper lip entire, the lower lip shortly 3-lobed. *Stam.* included under the upper lip of the corolla. *Nutlets* oblong, 3-angled, subtruncate at the apex, smooth.

1. *L. nepetifolia* (L.) R. Br.

Griseb. Fl. 492: Urb. Symb. Ant. 4. 539; 8. 604: Britt. & Millsp. Bah. Fl. 378: Britt. Fl. Berm. 324: Kostermans in Pulle, Fl. Surin. 4. 1. 352.

Erect, rather coarse *herb* up to 2 m. high, thinly pubescent throughout; *lvs.* broadly ovate, commonly 10 cm. long or less, bluntly toothed, shortly acuminate at apex, rounded at base and abruptly wedge-shaped and decurrent along the *petiole*, which is about as long as the blade; floral leaves much reduced, oblong-lanceolate; *glomerules* many-flowered, globose, dense, remote, 5-6 cm. in diameter at maturity; *cal.* in flower 12 mm. long, in fruit twice as long; *cor.* 2-2.5 cm. long, orange, hairy; *nutlets* 3 mm. long.

Trinidad: Herb. Trin. 2744; Cocorite (Herb. Trin. 3878, 14.8.1889); North Post (Herb. Trin. 5372, 9.4.1893); Arima (Dannouse, *ann.* 1900); Cedros (Herb. Trin. 7173, 29.9.1915); Siparia (Herb. Trin. 14195, 29.2.1948); *sine loc.* (de Shack in Herb. Kew).

Waste and cultivated lands.

Native of the Old World tropics. Naturalized in the West Indies and continental tropical America.

SEMI-NATURALIZED ALIENS

Anisomeles indica (L.) Kuntze

A. ovata R. Br.

A robust, strong-smelling herb with mauve flowers; used medicinally for stomach pains, &c. Locally cultivated in gardens and escaping onto waste ground. Native of Tropical Asia.

St. Augustine (Herb. Trin. 14276, 19.3.1949); Marper estate (Herb. Trin. 14294, 30.3.1949); Gov't House grounds (Broadway 2887, 27.2.1907 in Herb. Kew).

Scutellaria ventenatii Hook.

A herb 50 cm. to 1 m. tall, with red flowers, found escaping from cultivation on a roadside in the Aripo valley. Native of Colombia.

Heights of Aripo (Herb. Trin. 13486, March, 1940); Aripo valley (Herb. Trin. 14358, 30.5.1949).

DOUBTFUL RECORDS

Scutellaria purpurascens Sw.

Sieber 169 in Herb. Kew, said on the label to have come from Trinidad, and cited by Grisebach and Urban, is more likely to have been collected in Martinique.

Leucas martinicensis (Jacq.) R. Br.

Sieber 165, cited by Grisebach, is no longer in Herb. Kew. It was also probably collected in Martinique.

COHORT 11. PLANTAGINALES

FAMILY 1. PLANTAGINACEAE

By E. E. CHEESMAN

Annual or perennial *herbs*, often almost stemless or stoloniferous. *Leaves* radical or alternate, 1-many-nerved, the *petiole* often dilated at base and sheathing. *Flowers* small, regular, hermaphrodite or monoecious, arranged with bracts in terminal or axillary spikes or heads. *Calyx* 4-parted, usually scarious, persistent. *Corolla* scarious with an ovoid or cylindrical tube and 4-lobed limb. *Stamens* 4 or less, inserted in the corolla-tube and alternating with the lobes, or occasionally hypogynous; *anthers* 2-celled, opening lengthwise. *Ovary* superior, 1-4-celled. *Style* simple. *Ovules* 1 or more in each cell. *Fruit* a circumscissile capsule or a bony nutlet.

1. PLANTAGO L.

Fls. hermaphrodite, or dimorphic and polygamous. *Cal.* of almost equal lobes, or 2 larger. *Cor.* equalling the calyx or rarely exserted, its lobes 4, equal, spreading. *Stam.* 4. *Ovary* 2-celled or falsely 3-or 4-celled; *ovules* 1 to many in each cell. *Capsule* membranous circumscissile at the middle or near the base.

1. *P. major* L.

Griseb. Fl. 389; Britt. & Wils. Sci. Surv. Porto Rico 6. 222; Lanjouw in Pulle, Fl. Surin. 4. 2. 254.

Perennial *herb*, with a short, thick, erect rootstock; *lvs.* broadly ovate to rounded, the blades 5-15 cm. long, entire or wavy-margined, irregularly dentate near the base, tapering into a *petiole* which is as long as the blade or a little longer, blades prominently longitudinally ribbed, the ribs distinct to the sheathing base of the petiole; *infl.* an erect spike, the lower portion or peduncle up to 20 cm. long, the upper flowering portion at length about as long, lowest flowers somewhat distant, the rest crowded; *cal.* 2 mm. long; *cor.* just exceeding the calyx, its acute lobes at length reflexed; *fls.* markedly protogynous, the feathery *style* first exserted about 3 mm. beyond the corolla, *anthers* exserted later on slender *filaments* about as long as the style; *capsule* 3 mm. long, about 16-seeded.

Usually found only near habitations, where it is probably an escape from cultivation rather than naturalized. Also grown for medicinal purposes.

A widely distributed weed, originating in the Old World, and recorded from most parts of the West Indies and continental tropical America.