

PROPERTY OF THE BOTANY DEPARTMENT

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VOL. 1.]

[PART 2.

FLORA

OF

TRINIDAD AND TOBAGO.

PARIETALES.
POLYGALINAE,
CARYOPHYLLINAE.
GUTTIFERALES.
GERANIALES.

BY
R. O. WILLIAMS.

MALVALES.
BY
R. O. WILLIAMS and E. E. CHEESMAN.

Price Six Shillings.



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COHORT 2. PARIETALES.

BY

R. O. WILLIAMS.*

Pet. present.

Sep. 2-3. Herbs with coloured juice; lvs.
lobed.....1. **Papaveraceae.**

Sep. 4.
Stam. 6, tetradynamous. Herbs.....2. **Cruciferae.**
Stam. numerous, or if few not tetra-
dynamous. Herbs, shrubs or trees....3. **Capparidaceae.**

Sep. 5.
Cor. irregular. Herbs, shrubs or trees....4. **Violaceae.**

Cor. regular; anths. opening by pores....5. **Bixaceae.**

Pet. none. Sep. 4-5; anths. longitudinally
dehiscent. Shrubs or trees.....6. **Flacourtiaceae.**

FAMILY 1. PAPAVERACEAE.

Herbs. Lvs. alternate, without stipules. *Fls.* hermaphrodite, solitary, large, regular. *Sep.* 2-3, falling as the flower opens. *Pet.* 4-6, imbricate, deciduous. *Stam.* hypogynous, numerous, free; *fil.* filiform; *anths.* longitudinally dehiscent. *Ov.* 1-celled, with parietal placentas and numerous ovules; *style* very short.

Very few members of this family are under cultivation in Trinidad. *Argemone grandiflora* Sweet, a plant with large, white fls. is grown to some extent.

1. ARGEMONE L.

Glaucous, spiny herbs, with abundant yellow juice. *Lvs.* sessile. *Fls.* terminal. *Ov.* with 4-6 placentas; *stig.* distinct. *Caps.* very spiny, dehiscent at the apex by valves.

1. ***A. mexicana* L.** Mexican Poppy.

Griseb. Fl. 13: Fawc. and Rendl. Fl. Jam. 3. 221.

Herb up to 1 m., erect; *lvs.* pinnatifid, the teeth spiny, a few scattered spines also occur on the veins chiefly beneath, veins

*The manuscript was critically read by Mr. N. Y. Sandwith of Kew to whom the writer hereby gratefully acknowledges considerable help in its revision especially as regards the genera *Rinorea* and *Xylosma* which he has largely contributed.

densely greyish glaucous above giving the plant the general appearance of having broad white markings, the *basal lvs.* as much as 23 cm. long, by 12 cm. wide, partially stem clasping; *fls.* yellow, sessile or subsessile, about 6 cm. broad, with 1-3 leafy bracts; *sep.* acuminate, pouched and spiny at the apex, about 2 cm. long; *pet.* in two series, rounded, narrowing at the base; *stam.* not exceeding the ovary; *stig.* crimson; *caps.* 3-5 cm. long, furrowed, 1.5-2 cm. broad, 4-6 valved; *seeds* black, rounded, pitted, about 2 mm. long.

General but not abundant in waste and cultivated ground, Trinidad.

West Indies. Widely naturalised in trop. and sub-trop. countries.

FAMILY 2. CRUCIFERAE.

Annual or perennial *herbs* with watery acrid sap. *Lvs.* alternate. *Fls.* hermaphrodite, usually in terminal racemes or corymbs. *Sep.* 4, free, in two series, the inner often pouched at the base. *Pet.* 4, spreading, cross-shaped. *Stam.* usually 6, 4 long and 2 short (in *Lepidium* 2-4). *Ov.* formed of 2 united carpels, the parietal placentas united by a partition. *Fruit* a siliqua (*i.e.*, a narrow 2-valved capsule with 2 parietal placentas from which the valves separate on dehiscence) or a silicula (*i.e.*, if the length is not more than 2-3 times greater than the breadth).

Fruit a siliqua.

Seeds in two rows in the pod.

Fls. greenish-yellow.....1. *Rorippa*.

Fls. white.....2. *Nasturtium*.

Seeds in one row in the pod.....3. *Brassica*.

Fruit a silicula.....4. *Lepidium*.

1. *RORIPPA* Scop.

Herbs. *Lvs.* simple or pinnately-lobed, dissected or rarely entire. *Fls.* small, yellow. *Sep.* spreading. *Stam.* 1-6. *Style* short or slender; *stig.* 2-lobed or nearly entire. *Pods* short, round or nearly so, not beaked. *Seeds* turgid, minute, in two rows in each cell.

1. *R. heterophylla* (Blume.) comb. nov.

Nasturtium heterophyllum Blume.

Urb. Symb. Ant. 3. 517: Fawc. & Rendl. Fl. Jam. 3. 238.

Annual, spreading, 20 cm. high or less; *lvs.* ovate, lobed at the base, finely toothed, glabrous, the lower stalked, 5-6.5 cm. long, the upper sessile and smaller; *fls.* greenish-yellow, 1.8 mm.

long; *sep.* erect, narrowly oblong; *pet.* none; *stam.* 6; *pedi.* 2-3 mm. long on the fruit; *siliqua* narrowly linear, very straight, 2-3.5 cm. long, 0.75 mm. broad, scarcely beaked, the *stigma* persistent; *seeds* numerous.

Weed in cultivated ground and in waste places. River Estate, Diego Martin, St. Clair Experiment Station, Trinidad.

Trop. Asia and America.

2. NASTURTIIUM R. Br.

Herb, aquatic. *Lvs.* pinnately divided. *Fls.* small, white, in terminal racemes. *Pods* linear to linear oblong, tipped with the rather stout style; *Pedi.* slender; *Seeds* in two rows in each cell of the pod.

1. *N. officinale* R. Br. Water-cress.

N. fontanum Aschers: *Sisymbrium Nasturtium-aquaticum*, L. Urb. Symb. Ant. 3. 513: Fawc. & Rendl. Fl. Jam. 3. 237: Britt. & Wils. Sc. Surv. Porto Rico 5. 329.

Perennial aquatic; *stem* decumbent below, rooting at the nodes, erect above; *lvs.* pinnate, of 3-9 segments, ovate-oval to orbicular, obtuse, the terminal segment the largest, 1.3-5 cm. broad; *sep.* oblong, 2 mm. long; *pet.* white, 4-5 mm. broad; *siliqua* 15-18 mm. long; 1.5 mm. broad; *seeds* numerous.

Naturalized and cultivated to some extent in Trinidad and Tobago where it is largely used for culinary purposes.

Widely distributed throughout the world.

3. BRASSICA L.

Erect branching *herbs*, the basal leaves pinnatifid. *Fls.* yellow, showy, in long leafless racemes. *Fruit* a *siliqua*, nearly cylindrical, narrowing into a linear beak, valves convex, 1-3 nerved. *Seeds* in one row in the pod.

1. *B. juncea* (L.) Coss. aut. Czern. Wild Mustard.

Brassica integrifolia O. E. Schulz: *Sinapsis juncea* L.:

S. integrifolia Vahl. ex West.

Urb. Symb. Ant. 3. 509: Fawc. & Rendl. Fl. Jam. 3. 240:

Britt. & Wils. Sc. Surv. Porto Rico 5. 327.

Herb up to 8 dm. high; *lvs.* variable in size and shape, the basal broadly obovate, often with small lobes at the base, coarsely toothed, 8-28 cm. long, long petioled, the upper smaller,

oblong to linear, toothed or entire, short petioled or sessile, glabrous or with few hairs; *racemes* loose, erect; *pet.* 6-9 mm. long, broadly obovate; *pod*s erect, spreading, 3-4 cm. long, 2 mm. broad, the *beak* 3-5 mm. long.

Herb. Trin. 4776, River side, Debé Valley, Trinidad.

West Indies, Venezuela, Brazil, Africa, Asia. A common casual in many other countries.

4. LEPIDIUM L.

Erect *herbs*. *Lvs.* pinnatifid-lobed or entire. *Fls.* small, white, racemose. *Sep.* short, equal at the base. *Pet.* short or none. *Stam.* 6 or 2. *Fruit* a 2-celled, flattened, oblong to orbicular *silicula*. *Seed* solitary in each cell, pendulous.

L. virginicum L.

Urb. Symb. Ant. 3. 494: Fawc. & Rendl. Fl. Jam. 3. 242: Britt. & Wils. Sc. Surv. Porto Rico 5. 326: Griseb. Fl. 14.

Annual, 50 cm. high or less; *lvs.* oblanceolate, spathulate or linear, the lower deeply toothed to pinnate, 4-10 cm. long, the highest minutely toothed or entire and smaller; *fls.* 1-2 mm. broad; *pet.* scarcely longer than the sepals; *pedi.* slender, 4-6 mm. long on the fruit; *stam.* 2; *silicula* flat, 3-3.5 mm. long, 2.75-3 mm. broad, narrowly winged above and notched at the apex.

Herb. Trin. 853? and 2135 Naparima and San Fernando, Trinidad, Tobago ex Gr.

Continental North America, Bermuda, West Indies.

FAMILY 3. CAPPARIDACEAE.

Annual herbs, shrubs or trees. *Lvs.* alternate, simple or palmately compound. *Fls.* hermaphrodite, regular or irregular. *Sep.* 4, free or more or less united. *Pet.* 4. *Stam.* 4-numerous; *fil.* free or united at the base, sometimes united to the stalk of the ovary. *Ov.* borne on a gynophore (i.e., a stalk), 1-celled or several celled. *Ovules* numerous on parietal placentas. *Fruit* a 2-valved, many seeded capsule or berry; *embryo* generally curved.

Herbs (sometimes shrubby). Fruit
a capsule

Stam. free, 1. Cleome.

Stam. attached to the gynophore... 2. Gynandropsis.

Shrubs or trees. Fruit a berry.

Sep. free, or the two outer united... 3. Capparis.

Sep. united—

Stam. about three times as long

as the petals, 4. Steripoma.

Stam. shorter than the petals..... 5. Moriscnia.

lvs. with 3 leaflets

6. *Crotalaria* an p 25

1. CLEOME L.

Herbs or low shrubs, annual or perennial, glabrous or glandular. Lvs. simple or with 3-7 leaflets. Fls. solitary or racemose. Sep. 4, united or free. Pet. nearly equal, entire, sessile or clawed. Stam. usually 4-6, free. Ov. sessile or stalked. Fruit a long, many-seeded capsule. Seeds kidney-shaped.

Low shrub. Pet. gradually narrowed to the base.....1. *C. gigantea*.

Herbs. Pet. provided with a distinct claw.

Petioles having two stipular prickles.

Fls. in terminal racemes.....2. *C. spinosa*.

Fls. solitary.....3. *C. aculeata*.

Petioles unarmed.

Fls. racemose.....4. *C. serrata*.

Fls. solitary.

Stam. 6, fls. white.....5. *C. ciliata*.

Stam. 12-20, fls. yellow.....6. *C. icosandra*.

1. *C. gigantea* L.

DC. Prod. 1.238: Don's Gard. Dict. 1.272: Sprague in Gard. Chron. (1909) pt. I.114.

Shrub 1-2 m., erect, velvety-pubescent, the young branches glandular; lfts. 7, 8-18 cm. long, 2.5-5 cm. broad, lanceolate, lanceolate-oblong or oblanceolate with 30-40 veins on each side, petioles longer than the leaves, 15-20 cm. long; fls. greenish-yellow, in large terminal racemes 1.5-6 dm. long; sep. linear, unequal, reflexed and at length revolute, glandular and deciduous; pet. linear, 5 cm. or more long, gradually narrowed to the base so that they have no distinct claw; receptacle fleshy, orange-coloured, somewhat globose, the stalk of the ovary elongated; stam 6, rarely 4, equal; fil. 7.5 cm. long, curved upwards, greenish, tinged with red towards the top; anths. linear, purplish-yellow; silique 10-15 cm. long.

Not seen. Trinidad, ex Eichler in Flora Brasiliensis.

Widely distributed over Trop. America.

2. *C. spinosa* Jacq.

C. pungens Willd.

Jacq. Sel. Stirp. Amer. 190: Sprague in Gard. Chron. (1909) pt. I.114: Urb. Symb. Ant. 4.251: Fawc. & Rendl. Fl. Jam. 3.225: Britt. & Wils. Sc. Surv. Porto Rico. 5. 331: Griseb. Fl. 15.

Herb, 6-15 dm. high, more or less glandular-pubescent; lvs. usually having 5-7 lanceolate lfts., sometimes 3, 3-9 cm. long, the lower long-stalked, the upper modified into the simple, sessile

bracts of the raceme; *petioles* often with 2 prickles at the base; *racemes* 1-4 dm. long; *sep.* narrowly lanceolate, 4-6 mm. long, reflexed; *pet.* white to pale rose, obovate, about 2.5 cm. long, including the claw which is about as long as the limb; *stam.* 6, crimson, twice as long as the petals; *stig.* sessile; *caps.* linear-cylindrical, 5-12 cm. long, the *gynophore* about half as long.

A variable plant of which several forms are recorded. Waste and cultivated ground, Woodbrook, Caroni River and Monos, Trinidad, Scarborough, Tobago.

West Indies, Trop. and Sub-tropical America.

3. *C. aculeata* L.

Britt & Wils. Sc. Surv. Porto Rico 5.331.

Herb. up. to 9 dm. high, glandular-puberulent; *lfts.* 3, elliptic-obovate, or elliptic-ovate, 2-6 cm. long, obtuse or acute at the apex, the upper modified into the simple, sessile bracts of the raceme; *fls.* solitary, axillary; *sep.* narrowly lanceolate or oblong, 2-3 mm. long, reflexed; *pet.* elliptic, clawed, white, about 5 mm. long; *stam.* 6, greenish; *caps.* linear-cylindrical, 2.5-6.5 cm. long, the *gynophore* very short or wanting, the *pedicel* of the capsule 1-2.5 cm. long.

Woodbrook foreshore. A garden and wayside weed, Trinidad.

West Indies, South America and Trop. Africa.

4. *C. serrata*, Jacq.

C. polygama L.

Jacq. Sel. Stirp. Amer. 190, t. 180. f. 43: Fawc. & Rendl. Fl. Jam. 3.227: Britt. & Wils. Sc. Surv. Porto Rico 5.332.

Herb. about 6 dm. high or less, glabrous, without prickles; *lfts.* 3, or one only near the base, lanceolate or narrowly elliptical, acuminate, minutely serrate, 3-10 cm. long, *petioles* 2-5 cm. long; *racemes* in fruit 1-3 dm. long; *bracts* minute, awl-shaped, deciduous; *fls.* about 1 cm. long, and 1.5 cm. broad; *pedi.* 1-1.5 cm. long; *sep.* green, lanceolate, spreading, 2.5 mm. long; *pet.* greenish-white, rose at the base, obovate, reflexed, 8 mm. long, the claw much shorter than the limb; *stam.* 6, about as long as the petals; *fil.* pinkish; *ov.* sessile; *stig.* capitate; *caps.* about 5 cm. long, linear-cylindrical, sessile or very shortly stalked.

St. Ann's, Trinidad.

Jamaica, Cuba, S. Mexico and Cont. Trop. America.

5. *C. ciliata* Schum. and Thonn.

Fawc. and Rendl. Fl. Jam. 3. 226; Britt. and Wils. Sc. Surv. Porto Rico 5.332; Oliver, Fl. Trop. Africa. 1.78.

Herb. 3-9 dm. high, erect or sometimes trailing, sparsely pilose or subglabrous; *lfts.* 3, rhomboid-elliptic or lanceolate, 9-25 mm. long, minutely or obsoletely fringed and very thinly pilose-setulose, the *lvs.* mostly long-stalked or the upper shorter or sometimes sessile; *fls.* solitary, axillary; *sep.* narrowly lanceolate, about 2-3 mm. long; *pet.* white, 5-6 mm. long; *stam.* 6; *caps.* linear-cylindrical, 2.5-6 cm. long, prominently nerved, the *gynophore* 0.5-1 cm. long and the slender pedicel 13-20 mm. long; *seeds* ridged.

Seashore, Woodbrook, St. Clair Expt. St., Naturalized in Trinidad, Tortola, Virgin Gorda and Jamaica.

Native of Trop. Africa.

6. *C. icosandra* L.

C. viscosa L. Polanisia viscosa Urb. Symb. Ant. 8. 238. Britt and Wils. Sc. Surv. Porto Rico 5.332.

Annual *herb.* 3-9 dm. high, viscid-glandular; *lfts.* 3-5, obovate, oblanceolate or elliptic, 1-7.5 cm. long, the margins glandular-ciliate; *fls.* solitary in the axils of the upper leaves; *sep.* oblong-lanceolate or lanceolate, 6.5-8 mm. long; *pet.* yellow, obovate, about 1 cm. long; *stam.* 12-20, free; *caps.* cylindrical, 5.5-10 cm. long, tapering to the apex, striate, viscid-glandular.

Not seen. Tobago. ex Urb. loc. cit.

Bermuda, West Indies. Naturalized from the Old World Tropics.

2. GYNANDROPSIS DC.

Annual *herbs.* *Lvs.* of 3-7 *lfts.* *Racemes* leafy. *Sep.* spreading, deciduous. *Pet.* obovate, clawed, imbricate or open. *Stam.* 6; *fil.* united to the gynophore, free above. *Fruit* a stalked, elongated capsule.

G. speciosa DC. Widely spread in Cont. Trop. America and native of some of the W. Indies, has simple bracts and magenta flowers changing to mauve with age. It is used for flower garden purposes and is apparently becoming naturalized.

1. *G. gynandra* (L.) Briquet.

Cleome gynandra L.: *C. pentaphylla* L.: *Gynandropsis pentaphylla* DC.

Urb. Symb. Ant. 4. 252; Fawc. and Rendl. Fl. Jam. 3. 229;

Britt. and Wils. Sc. Surv. Porto Rico. 5. 331.

Annual glandular-pubescent herb, erect, branching, 5-10 dm. high; *lfts.* 3-5, elliptic to oval or obovate, 2-6 cm. long, acute or obtuse, entire or minutely toothed; *racemes* 1-4 dm. long; bracts trifoliate; *sep.* lanceolate, 3.5-5 mm. long; *pet.* 1-1.5 cm. long, white to purplish, changing with age; *caps.* cylindrical, 4-9 cm. long, the *gynophore* 2-3 cm. long, the part above the union of the stamens about half as long as that below; *pedi.* on fruit about 2 cm. long.

Waste Ground, Trinidad. Roxborough, Tobago.

West Indies, Trop. and Sub-tropical America, Tropical Africa and Asia.

3. *CAPPARIS* L.

Trees or shrubs. *Lvs.* simple, usually leathery, sometimes with stipules on young or barren shoots. *Fls.* corymbose or racemose. *Sep.* 4, free or partly united, often with a gland at the base. *Pet.* 4, imbricate. *Stam.* few or numerous, the *filaments* slender.

Ov. stalked (the *gynophore*), 1-4 celled, *placentas* generally 2; *stig.* sessile. *Fruit* a long-linear or oblong, or subglobose berry, indehiscent or rupturing irregularly. *Seeds* numerous or few embedded in pulp.

Lvs. pubescent, not scaly.....1. *C. tenuisiliqua.*

Lvs. glabrous above, scaly beneath.

Stam. about as long as the petals....2. *C. odoratissima.*

Stam. 2 or 3 times as long as the petals. 3. *C. cynophallophora.*

Lvs. glabrous on both sides.

Stam. about as long as the petals4. *C. baducca.*

Stam. much longer than the petals.

Lvs. prominently net-veined on both sides.

Fruit torulose (cylindrical and swollen in parts) 6-20 cm. long,

1-1.5 cm. broad5. *C. flexuosa.*

Fruit not torulose, 10-18 cm. long,

up to 3 cm. broad6. *C. coccolobifolia.*

Lvs. not prominently net-veined.

Lvs. relatively long and narrow. 7. *C. trinitensis.*

Lvs. relatively short and broad. 8. *C. verrucosa.*

1. *C. tenuisiliqua* Jacq.

Jacq. Sel. Stirp. Amer. 162. t. 105.

Tree, 6 m., pubescent, *lvs.* deciduous ovate, 5-9 cm. long, 3-5.3 cm. broad, rounded at the base, acute or obtuse at the apex, thin, smooth, minutely pubescent on both sides when young, *petioles* 6-27 mm. long, densely pubescent; *fls.* white, in terminal racemes; *sep.* united, the lobes triangular, 2-3 mm. long, pubescent; *pet.* much longer than the calyx; *stam.* numerous, much longer than the petals and exceeded by the gynophore; *siliqua* long and narrow, glabrous.

The sole Trinidad specimen seen has only young leaves; *lvs.* of South American specimens are glabrous and reticulate on the upper surface when fully developed, and the *petioles* and all upper parts of plants strongly pubescent when young.

2683, Britton, Freeman and Watts, Chacachacare, Trinidad. Southern West Indies and Northern South America.

2. *C. odoratissima* Jacq. Olive Wood.

Don's Gard. Dict. 1. 283 f. 53.

Shrub or small *tree* with scaly branches; *lvs.* oblong or elliptic, leathery, 4-11 cm. long, 2.5-4 cm. broad, obtuse or notched at the apex (*i.e.*, in all the Trinidad material examined), rounded or obtuse at the base, glabrous and shiny above, densely scaly beneath; *fls.* 2 cm. diam., highly fragrant; *pet.* 4, cream coloured at first changing to purplish, oblong, rounded at the apex, 5-8 mm. long, scaly on the outside; *stam.* 5-7 mm. long; *pistil* shorter than the petals; *ovary* sessile or barely stalked; *fruit* cylindrical, swollen and constricted in parts, 12 cm. long or less, dehiscing longitudinally, brownish or silverish-scaly and warty outside, scarlet within, the seeds enclosed in scarlet pulp.

Patos and Chacachacare, Trinidad.

St. Lucia, St. Vincent, Panama, Granada, Venezuela, Colombia

3. *C. cynophallophora* L.

C. jamaicensis Jacq. and Griseb. Fl.: *C. intermedia* Eichl. non H.B.K.

L. Sp. Pl. 504 (1753): Jacq. Sel. Stirp. Amer. 160, t. 101: Urb. Symb. Ant. 4. 252: Britt. and Wils. Sc. Surv. Porto Rico, 5. 333.

Shrub or *tree*, 10-15 m. high, minutely scaly; *lvs.* elliptic or oblong-elliptic, the apex blunt or sharply acute, leathery, glabrous on the upper surface, scaly beneath, 4-12 cm. long, 2-6 cm. broad, *petiole* 1-3 cm. long; *fls.* fragrant; *sep.* 8-11 mm. long, nearly as

long as the petals, reflexed; *pet.* white, changing to purplish, scaly outside, glabrous within, 10-13 mm. long; *stam.* 2 or 3 times as long as the petals; *ovary* with the gynophore about as long as the stamens; *fruit* to 3 dm. and more.

Herb. Trin., All Saints Churchyard, 7.12.1921, J. A. Pinder; Crueger and Sieber, 97, both in Kew Herbarium. Trinidad.

Florida and Keys, Bahamas, West Indies, Costa Rica, Mexico, Panama, Margarita and Venezuela.

4. *C. baducca* L.

C. frondosa Jacq.

Jacq. Sel. Stirp. Amer. 162. t. 104: Urb. Symb. Ant. 4. 253:

Fawc. and Rendl. Fl. Jam. 3. 233: Britt. and Wils.

Sc. Surv. Porto Rico. 5. 334.

Shrub or *tree* up to 8 m., glabrous and without scales; *lvs.* elliptic-oblong, leathery, 1-3 dm. long, 3.5-10 cm. broad, the apex acute or acuminate, the veins prominent on both sides, *petioles* 0.5-5 cm. long; *fls.* odourless; *cal.* 4-lobed, 1.5-2 mm. long, the lobes imbricate, roundish; *pet.* obovate, pale greenish, white or purplish, 9-11 mm. long, 7-8 mm. broad; *stam.* as long as the petals; *fruit* short, narrowly oblong, 3-7.5 cm. long, irregularly cylindrical, constricted and swollen in parts.

Forests in moist districts, Trinidad.

West Indies, Central and South America.

5. *C. flexuosa* L. Mabouya

C. cynophallophora Griseb. Fl., excl. B.

Jacq. Sel. Stirp. Amer. 158 t. 98: Urb. Symb. Ant. 4. 254:

Fawc. and Rendl. Fl. Jam. 3. 234: Britt. and Wils.

Sc. Surv. Porto Rico 5.334.

Strong woody, *climbing shrub*; *lvs.* elliptic or oblong-elliptic, usually rounded at both ends, the apex sometimes acute or notched, 5-8 cm. long, 2.5-4.7 cm. broad, glabrous, the nerves prominent on both sides, leathery, *petioles* 5-7 mm. long; *sep.* 1-1.5 cm. long, rounded; *pet.* 4, imbricate, green, obovate or oblong, 2.5-3 cm. long, about 1.5 cm. broad; *stam.* very numerous, of varying length, 4-6 cm. long; *fil.* white, stoutish; *fruit* 6-24 cm. long, 1-1.5 cm. broad, the stalk often half as long as the pod, the *pod* cylindrical, compressed by drying, smooth and glabrous outside, constricted and swollen in parts, tardily opening longitudinally, the *pulp* scarlet; *seeds* obovoid-oblong with a white, pulpy testa.

Patos, Chacachacare, Caledonia, Sea Shore, Plaisance Estate, Mayaro, Trinidad. Farm Road, Tobago.

Florida, West Indies, Continental Tropical America.

6. *C. coccolobifolia* Mart. ex Eichl. Mabouya.*C. cynophallophora latifolia* Griseb.

Urb. Symb. Ant. 4. 255: Britt. and Wils. Sc. Surv. Porto Rico 5. 335: Griseb. Fl. 18.

Shrub or small *tree*, 3-10 m.; *lvs.* broadly oblong or elliptic, acute, obtuse or notched at the apex, sub-cordate at the base, rigidly leathery, 6-10 cm. long, 4-6.5 cm. broad, glabrous and prominently veined on both sides, *petioles* about 1 cm. long with a subglobose gland in the axil; *corymbs* few-fl'd; *pedi.* stout, 6-20 mm. long, minutely pubescent; *cal.* lobes rounded, 6-8 mm. long; *pet.* obovate or narrowly obovate, 18-25 mm. long, 9-11 mm. broad, greenish, tinged with rose outside, rose-coloured within; *fil.* about 6 cm. long, numerous, slender, exceeded by the gynophore; *ov.* linear, pubescent; *fruit* 10-18 cm. long, up to 3 cm. broad, not conspicuously swollen and constricted, the *valves* dehiscing longitudinally and from the apex, roughish outside and with an abundance of brilliant scarlet pulp within; *seeds* oval, 15 mm. long, the *testa* white and pulpy.

Plaisance Estate, Patos, and Chacachacare, Trinidad.

West Indies and Northern South America.

7. *C. trinitensis* Urb.

Notizbl. Bot. Gart. Mus. Berlin-Dahlem. 8.25 (1921).

Small *tree*, 8 m. or less, young branches roundish, minutely pubescent; *lvs.* relatively long and narrow, lanceolate or oblong-lanceolate, gradually attenuate to an acute point, or gradually acuminate, the base obtuse or rounded or somewhat heart-shaped, 7-11 cm. long, 2.5-3.5 cm. wide, leathery, somewhat shiny above, glabrous, *petioles* 1-5 mm. long; *infl.* terminal and axillary, racemose, 3-5 cm. long; *pedi.* 10-17 mm. long; *sep.* green, imbricate, rounded, leathery, the exterior 4 mm. long, the interior 5 mm. long; *pet.* pure white, spreading, obovate or narrowly obovate, 15-20 mm. long, 8-10 mm. wide; *stam.* about 36, 2-3 cm. long; *anths.* oblong-linear, recurved; *ovary* green, linear, 3 mm. long on a stalk about 2.5 cm. long; *caps.* not seen, cylindrical-oblong, minutely wrinkled but not warty, 4.5 cm. long, 1.7 cm. broad, somewhat or scarcely constricted at the middle (lilac-coloured ex Broadway); *seeds* about 4, reniform, 5 mm. long, 8 mm. broad, smooth (ex Urb.).

This species is closely allied to *C. verrucosa* Jacq. of which it may be merely a variety.

Radix Point, Mayaro, Trinidad.

8. *C. verrucosa* Jacq.

Small tree; *lvs.* relatively short and broad as compared with *C. trinitensis*, usually obovate-oblong, rarely ovate, suddenly acuminate or almost cuspidate, often rounded or obtuse, obtuse or rounded or somewhat heart-shaped at the base, 7-11 cm. long, 3-4.5 cm. wide, leathery, glabrous, barely petioled; *fls.* white; *sep.* 4, rounded, 4-5 mm. long; *pet.* 4, about 12 mm. long; *stam.* numerous, much longer than the petals; *fruit* warty.

Herb. Trin. 2333 and 10986, Roadside to Teteron's Bay; Lockhart 1922, Britton and Hazen 1694, Hillsides, Monos and Chacachacare, Trinidad.

Northern South America.

4. *STERIPHOMA* Spreng.

Large shrub or small tree, the branches of the inflorescence clothed with star-shaped hairs. *Lvs.* simple, leathery, long-stalked, the *petioles* thickened at the apex. *Fls.* in terminal racemes, the *pedicels* thickened at the apex, 1-fld. *Cal.* 2-4 lobed with 4 scales at the base within. *Pet.* 4, sessile, the two anterior ones larger. *Stam.* 6, much longer than the petals. *Ovary* 2-celled; *ovules* numerous, in two series; *stig.* sessile. *Berry* more or less cylindrical with a thick rind. *Seeds* numerous, angular, embedded in pulp.

S. elliptica Spreng.

Griseb. Fl. 20.

Shrub or small tree; *lvs.* oblong-elliptic, tapering at both ends, 7-14 cm. long, 2-5.5 cm. broad, glabrous above, pubescent and roughish beneath; *petioles* 2-4.5 cm. long; *cal.* tubular, split on one side, 8-15 mm. long, brilliant reddish-orange, rough, minutely and densely pimpled, *scales* about 1.5 mm. long, oblong, blunt, fringed with hairs; *pet.* spatulate, orange-yellow, 12-15 mm. long, densely and minutely pubescent; *stam.* yellow, 4-6 cm. long; *berry* oblong, 10 cm. or more long, 3.5 cm. broad, the rind about 5 mm. thick.

Gasparee, Chacachacare, Philippine, near San Fernando, Trinidad, Venezuela.

5. *MORISONIA* L.

Trees or shrubs, unarmed. *Lvs.* simple, leathery. *Cal.* irregularly rupturing into 2 valves or 2-4 cleft. *Pet.* 4. *Stam.* 6-20, shorter than the corolla; *fil.* awl-shaped. *Ovary* 1-celled or the 4 parietal placentas united in the centre to make it falsely 4-8 celled; *stig.* discoid, sessile. *Berry* subglobose. *Seeds* numerous.

M. americana L. Sapotille Marrow.

Britt. & Wils. Sc. Surv. Porto Rico 5. 336.

Shrub or small *tree*, the twigs and leaves scaly when young, becoming glabrous; *lvs.* oblong to oblong-elliptic, 8-25 cm. long, 2.5-10 cm. broad, usually obtuse at the apex and rounded or subcordate at the base, leathery, finely net-veined, *petioles* 2-4.5 cm. long, somewhat enlarged at both ends; *corymbs* short-stalked; *cal.* rupturing in two unequal parts, about half as long as the petals; *pet.* obovate, imbricate, 1-1.2 cm. long, 5.5-6 mm. broad, exceeding the stamens, scaly on the back, more or less downy within; (*stam.* 12 in two rows; *fil.* jointed in the middle, Crueger); *ovary* 1-celled, longitudinally striate; *fruit* oval, 3.5-4 cm. or more in diam. *Seeds* 7-10 mm. diam.

Chacachacare, Trinidad.

Porto Rico to Trinidad and Northern South America.

FAMILY 4. VIOLACEAE.

Herbs or *shrubs*. *Lvs.* alternate or opposite, simple; *stip.* leafy or small. *Fls.* hermaphrodite, regular or irregular. *Sep.* 5, unequal, usually persistent, overlapping. *Pet.* 5, mostly unequal. *Stam.* 5; *anths.* erect in a ring around the ovary, sessile or subsessile, the connective often flattened or produced beyond the cells into a membranous appendage. *Ovary* simple, sessile, with 3 parietal placentas; *style* simple. *Fruit* a capsule or berry. *Seeds* shortly stalked.

Fls. solitary 1. *Ionidium*.Fls. paniculate or racemose 2. *Rinorea*.**1. IONIDIUM Vent.**

Herbs, rarely small *shrubs*. *Lvs.* alternate (in the local sp.) *Fls.* axillary and solitary. *Pet.* the lower one longest, pouched at the base, the two upper shortest. *Fil.* distinct, the lower spurred or glandular, the *anthers* touching each other. *Caps.* elastically 3-valved. *Seeds* ovoid-globose, with hard seed coats.

1. I. Ipecacuanha (L.) Vent.*Viola Ipecacuanha* L.

Low *shrub*, about 6 dm. high, clothed with long, weak, spreading hairs throughout; *lvs.* alternate, almost sessile, ovate, acute at the apex, narrowed or rounded at the base, 1.5-3.7 cm. long, 1-1.5 cm. broad, membranous, with weak, scattered hairs.

on both sides; *stip.* one on each side; *petiole* awl-shaped, about 5 mm. long, with membranous wings at the base; *fls.* not seen; (*sep.* about 1 cm. long; *anterior pet.* 2-3 times longer than the calyx, with the lamina 2-2.5 cm. wide when expanded, glabrous within, adpressed villosulous on the back and ciliate; *intermediate petals* half as long again as the calyx; 2 *posterior petals* about as long as the sepals, barbate at the apex; abridged from Eichler in Fl. Bras); *caps.* hairy, solitary, on stalks barely 2 mm. long; *sep.* on fruit, slightly longer than the capsule, ovate or oblong-elliptic, all awl-shaped at the apex, densely hairy and fringed with glands, about 1.5 mm. long; *seeds* 2 mm. long.

Cedros and Icacos.

Venezuela, Guiana and Brazil.

2. RINOREA Aubl.

Shrubs or trees. *Lvs.* alternate or opposite, entire or serrate. *Fls.* small, solitary or in terminal or axillary racemes or panicles. *Pet.* sessile or very shortly clawed. *Fil.* free or more or less united in local species, adnate to a gland which exceeds them, the connective scale extending beyond the anthers. *Caps.* 3-valved. *Placentas* uniovulate in local species. *Seeds* few, subglobose, glabrous or hairy.

Infl. simply racemose; *pet.* usually

4-5 mm. long; style straight.....1. *R. Riana*,

Infl. compound-racemose; *pet.* rarely

up to 3.5 mm. long; style bent at

base.....2. *R. Lindeniana*.

1. *R. Riana* (DC.) Kuntze.

Conohorea Riana DC.; *Riana guianensis* Aubl. *Alsodeia*

flavescens Griseb. Fl., not *Conohorea flavescens* Aubl.

Kew Bull. 1929, 75-78.

Lvs. ovate-elliptic to elliptic-oblong, up to 21 cm. long and 8 cm. broad, long-acuminate with the acumen at least 2 cm. long, acutely cuneate at the base and attenuate to the petiole which is 5-7 mm. long, obscurely crenate-serrate, reticulate on both sides but especially beneath; *infl.* simply racemose, puberulous, up to 12 cm. long, the *fls.* conspicuously pedicellate and drying dark brownish-chocolate, the buds normally ovate-lanceolate, and sharply acute; *sep.* ovate or elliptic, acute or cuspidate, ciliate, strongly and conspicuously ribbed on the back, 1.5-2 mm. long; *pet.* elliptic, obtuse, regularly ciliolate especially in the lower half when mature, normally 4-5 mm. long; *stam.* about 3 mm. long;

fil. about 0.5 mm. long, the free part of the gland thinner than the filament, truncate, short, rarely up to 0.4 mm.; *anths.* oblong-linear, 1.6-2 mm. long, narrower than the connective scale; *connective-scale* hyaline, glabrous, oval-elliptic, obtuse, usually 2.5 mm. long; *ov.* sub-globose, covered with stiff hairs, about 0.5 mm. in diameter; *style* straight, glabrous except in the lower third, 2.2-2.5 mm. long; *caps.* ellipsoid, puberulous, 2.5-3 mm. long, about 1.4 cm. broad; *seeds* not seen.

Herb. Trin. 5903, Arima, Trinidad, February, 1846, in fruit and in Herb. Kew, with immature inflorescence.

British, French and Dutch Guiana, Venezuela.

2. *R. Lindeniana* (Tul.) Kuntze.

Alsodeia Lindeniana Tulasne in Ann. Sci. Nat. 3.7. 364-5 (1847):
R. Riana Blake in Contr. U.S. Nat. Herb. 20,503, t. 32:
Kew Bull. 1929, 75-78.

Lvs. elliptic-oblong to oval-oblong, up to 20 cm. long and 8.5 cm. broad, shorter-acuminate with the acumen rarely up to 1.5 cm. long, oblique at the base and at least one (often both) of the margins rounded or almost cordate into the petiole, which is 3-5 mm. long, obscurely crenate-serrate, less strongly reticulate on both sides than *R. Riana*; *infl.* compound racemose, puberulous, up to 12 cm. long, the *fls.* shortly pedicellate and drying a fairly light brown, the *buds* small, ovate and obtuse; *sep.* ovate, obtuse, ciliolate, less strongly ribbed on the back, 1-1.5 mm. long; *pet.* ovate or elliptic, obtuse, glabrous or rarely very minutely ciliolate in the lower half, up to 3 or rarely 3.5 mm. long, often shorter; *stam.* up to 2.2 mm. long; *fil.* about 0.5 mm. long, the free part of the gland as thick as the filament, truncate or slightly erose at the apex, 0.5-0.7 mm. long; *anths.* ovate, as broad as the connective scale, 1-1.2 mm. long; *connective-scale* hyaline, glabrous, oval, obtuse, 1.5-1.8 mm. long; *ov.* subglobose, covered with stiff hairs, about 0.6 mm. in diameter; *style* strongly bent at the base, glabrous, up to 1.5 mm. long; *caps.* ellipsoid, acute at both ends, 1.8-2 cm. long, 14 mm. broad, puberulous, 3-seeded, the *seeds* subglobose, 6 mm. long, puberulous.

Chaguanas, Maracas, Tunapuna, Arima, Morne l'Enfer, Trinidad.
Venezuela, Colombia.

FAMILY 5. BIXACEAE.

Shrubs or small *trees*. *Lvs.* simple, toothed, lobed or entire.
Fls. hermaphrodite or rarely polygamous, large and showy.
Sep. 4-5. *Pet.* 4-5. *Stam.* numerous; *anths.* opening by terminal

pores. *Ovary* superior, 1-celled with 2 to several parietal placentas which are sometimes well-intruded; *styles* as many as the placentas, but united. *Fruit* a capsule. *Seeds* numerous, sometimes hairy.

- Lvs. palmately lobed 1. *Cochlospermum*.
 Lvs. entire 2. *Bixa*.

1. COCHLOSPERMUM Kunth.

Small tree. *Lvs.* palmately lobed. *Fls.* yellow, hermaphrodite, large and showy, in terminal panicles. *Sep.* 5, imbricate, deciduous. *Pet.* 5, imbricate. *Stam.* numerous; *anths.* oblong or linear. *Ovary* 1-celled. *Caps.* 3-5 valved. *Seeds* numerous, small, covered with cottony or silky down.

1. *C. vitifolium* Spreng.

Small erect tree; *lvs.* large, palmately 5-lobed, deciduous; *fls.* brilliant yellow, 11 cm. or more in diameter; *stam.* orange-coloured with scarlet markings; *Pods* nearly spherical, about 5 cm. long and rather less in diameter, depressed at the apex, smooth, densely pubescent; *seeds* clothed with long silky down.

It occurs on the Look out Hill adjoining the Botanic Gardens, Trinidad as an escape from cultivation.

Cent. and S. Trop. America.

2. BIXA L.

Shrub or small tree. *Lvs.* alternate, simple, entire, palmately nerved. *Fls.* pink, hermaphrodite, in terminal panicles. *Sep.* 5, imbricate, deciduous. *Pet.* 5, imbricate. *Anths.* oblong. *Ovary* 1-celled; *style* slender; *stig.* very shortly 2-lobed. *Caps.* loculicidally 2-valved. *Seeds* numerous; the *testa* pulpy.

1. *B. Orellana* L. Anatto. Roucou.

Lvs. ovate or somewhat heart-shaped at the base, the apex acuminate, 8-20 cm. long, 4-15 cm. broad, long-petioled; *fls.* 4-5.3 cm. diam; *sep.* broadly ovate to somewhat rounded; *pet.* pink, about 2.5 cm. long; *caps.* dark-red, ovoid, 3-4 cm. long, densely covered with soft spines; *seeds* reversely pyramidal, about 5 mm. long, covered with reddish-orange pulp largely used for colouring butter, milk, cheese, &c.

Naturalized in Trinidad and Tobago.

West Indies, Cont. Trop. America. Naturalized in many tropical regions.

FAMILY 6. FLACOURTIACEAE.

Trees or shrubs. *Lvs.* simple, alternate. *Stip.* minute or wanting. *Fls.* usually clustered, hermaphrodite, dioecious or polygamous. (*Sep.* 4-5. *Pet.* none; as regards the Trinidad spp.) *Stam.* few or numerous, hypogynous, free; *anths.* 2-celled, often short, longitudinally dehiscent. *Ovary* 1-celled with 1 or more parietal placentas or rarely the placentas meeting in the middle. *Fruit* a berry or capsule.

Flacourtia Ramontchi L' Her., the Governor Plum, is a small tree up to 10 m., native of S. India, with a strongly armed trunk. It is grown to a considerable extent for its globose, dark purple berries which are about 12 mm. diam. and make a good jelly; also very useful as a hedge plant.

Amongst other useful plants of this order the following are being tested in Trinidad for the production of Chaulmooegra oil, a reputed valuable specific for the treatment of leprosy: *Taraktogenos Kurzii* King., *Hydnocarpus Wightiana* Blume, *H. anthelminticus* Pierre and *Oncoba echinata* Oliver.

Trees unarmed.

Lvs. glabrous, with pellucid dots and lines 1. *Laetia*.

Lvs. with stellate hairs beneath and without pellucid dots and lines.... 2. *Ryania*.

Trees armed with simple and compound spines..... 3. *Xylosma*.

1. LAETIA L.

Trees. *Lvs.* with pellucid dots and lines. *Fls.* hermaphrodite (axillary and clustered in the Trinidad sp.). *Sep.* 4-5, broad, subpetaloid, widely overlapping, at length reflexed. *Pet.* none. *Stam.* numerous, rarely 10; *anths.* ovoid. *Ov.* usually with 3 placentas; *style* simple; *stig.* capitate or 3-lobed. *Fruit* a berry, often resinous, tardily opening by valves; *seeds* numerous, arillate, the seed-coat leathery.

L. procera (Poepp. and Endl.) Eichl. Sardine.

Samyda procera Poepp. and Endl.: *Laetia casearioides* Sagot.

Tree up to 30 m. high and 8 dm. diam.; *lvs.* oblong, abruptly and obtusely pointed, rounded at the base, 9-15 cm. long, 3.5-4.8 cm. broad, glabrous and reticulate veined on both sides; *petioles* 5-10 mm. long; *stip.* triangular, about 1 mm. long; *fls.* not seen; (*fascicles* 15-30 fld.; *pedi.* about as

long as the petiole; *sep.* 5, petaloid, ovate-oblong, obtuse, reflexed, 3-4 mm. long, not pellucid-punctate; *stam.* 12-20, about as long as the sepals; *ov.* ovoid-oblong, attenuate into a short style; (Eichl.); *fruit* sub-globose, 5-10 mm. long, the stalk about 1 cm. long; *sep.* reflexed and persistent, about 3-4 mm. long on the fruit; *seeds* 2.5 mm. long, minutely pitted.

Manzanilla, Arima, Arena Reserve, Trinidad.

Guiana and Amazonian Brazil.

2. RYANIA Vahl.

Shrubs or *trees* with star-shaped down. *Lvs.* entire, without pellucid dots. *Fls.* axillary or few-clustered, hermaphrodite. *Sep.* 5, 2 exterior and 3 interior, lanceolate or oblong, imbricate at the base, persistent. *Pet.* none. *Stam.* numerous, inserted around a disk; *anths.* linear, longitudinally dehiscent. *Ovary* sessile; *placentas* 4-5; *ovules* numerous; *style* simple; *stig.* minutely 4-5 lobed. *Fruit* a woody or corky capsule. *Seeds* arillate, numerous, smooth and brittle.

1. *R. speciosa* Vahl. Bois l'agli.

Griseb. Fl. 296.

Shrub or small *tree*, the branches thickly clothed with rusty down; *lvs.* oblong, abruptly acuminate at the apex, rounded or obtuse at the base, 10-23 cm. long, 3-6.5 cm. broad, glabrous above, puberulous beneath, *petioles* 3-4 mm. long; *fls.* solitary or in pairs, the pedicels about as long as the petioles; *sep.* cream-coloured, oblong-lanceolate, 3.5-4 cm. long, densely downy on both sides; *stam.* about as long as the sepals; *anths.* 7-8 mm. long; *style* about as long as the stamens, with long weak spreading hairs at the base. *Ovary* and disk thickly clothed with long erect, yellowish or rust-coloured hairs; *caps.* subglobose, longitudinally dehiscent, densely rusty pubescent, 2.5-3.5 cm. long; *seeds* about 4 mm. long.

Forests in wet or moist districts, Trinidad.

Venezuela.

DOUBTFUL SPECIES.

R. parviflora DC. Prod. 1.255.

Lvs. villous on the under surface, without ribs, peduncles one fld. This species is recorded from Trinidad by Eichler. We have not seen the specimen or found any other record of its occurrence in Trinidad.

3. XYLOSMA Forest.

Trees, often spiny. *Lvs.* toothed, shortly stalked. *Fls.* dioecious, in axillary clusters. *Sep.* 4-5, scale-like, generally ciliate, overlapping. *Pet.* none. *Stam.* numerous, free, often surrounded by a glandular disk; *anths.* versatile, short. *Ovary* surrounded by a disk; *placentas* 2, rarely 3-6, with 2 or few ovules on each; *style* entire or more or less divided, with dilated *stigmas* or sometimes the *stigma* sessile, flattened and lobed. *Berry* small, 1-celled, indehiscent, 2-8 seeded. *Seeds* obovoid, the coat smooth, hard and brittle.

1. *X. Seemanni* Triana and Planch. in Ann. Sci. Nat. ser.

4.17. p. 99 (1862).

X. nitidum Griseb. Fl. in part.

Kew Bull. 1929, 78-79.

Small *tree*, about 5 m., the *trunk* armed with compound, long, branched spines, the branches lenticellate and usually armed with short, simple spines; *lvs.* narrowly lanceolate, ovate to elliptical or ovate-lanceolate, shortly and obtusely acuminate or gradually attenuate with a long acumen, acutely cuneate at the base, rarely rounded, always conspicuously and rather deeply, often coarsely toothed, glabrous, conspicuously reticulate veined on both surfaces, not pellucid dotted, 5-12 cm. long, 2.5-5 cm. broad, *petioles* 5-6 mm. long; *pedi.* 2-4 mm. long; *male fls.*: *sep.* yellow, concave, roundish, 1-5 mm. long, slightly fringed with hairs; *stam.* 5 mm. long, the disk surrounding them orange-coloured; *female fls.*: *sep.* up to 2 mm. long and 1.5 mm. wide, unequal, ovate, obtuse or rounded, veined, glabrous on both sides except for a tuft of hairs and some weak ciliation near the apex; *pedi.* 2-6 mm. long; *ovary* suddenly contracted into 2 united *styles*, each with two rounded *stigmas* at their apex; *berry* ovoid, up to 8 mm. long and 4-6 mm. in diameter.

This species has been confused with *X. nitidum* A. Gr. ex Griseb. of Jamaica, which differs in the finer leaf-seriation, the much weaker reticulation of the upper surface, the different direction and different anastomosing of the lateral veins, and above all in the sepals which are conspicuously and regularly ciliate, and pubescent within over the whole surface. Triana and Planchon did not think Purdie's Trinidad plant was quite the same as Seemann's from Panama, but no serious discrepancy was discovered between them on a recent examination at Kew, and they both share the numerous characters which distinguish them from the Jamaican plant.

Wooded hillsides of the Northern Mountain Range, Trinidad.
Panama.

COHORT 3. POLYGALINAE.

BY

R. O. WILLIAMS.*

FAMILY 1. POLYGALACEAE.

Herbs or *shrubs*, sometimes climbing or rambling. *Lvs.* alternate, or rarely opposite or whorled, simple, entire, shortly petioled, without stipules. *Fls.* perfect, irregular, in terminal or axillary spikes, racemes or panicles. *Sep.* 5, free or the two lower united, the two innermost (the wings) much larger and petaloid. *Pet.* 3, or rarely 5, the anterior one (the keel) boat-shaped, often beaked or crested. *Stam.* usually 8, the filaments usually united for most of their length into a sheath which is split on the upper side and usually united at the base to the keel or upper petals; *anths.* opening by a subterminal pore. *Style* solitary; *stig.* often tufted. *Fruit* a 2-celled, loculicidal capsule, or indehiscent, dry, one-celled, and winged. *Seeds* solitary in each cell, usually pubescent, with arils.

Low herbs, or subshrubs. 1. *Polygala*.

Climbing or rambling shrubs.

Fls. reddish-purple, fruit winged. . . . 2. *Elsota*.

Fls. greenish-yellow, fruit a capsule. . 3. *Bredemeyera*.

1. *POLYGALA* L.

Low *herbs* or *sub-shrubs*. *Lvs.* alternate, or the lower ones sometimes whorled. *Fls.* in loose or compact, terminal or axillary spikes or racemes. *Pet.* usually 3, united at the base, the lower, (the keel) boat-shaped, entire, crested. *Stam.* 8, or rarely 6. *Ovary* 2-celled; *ovules* pendulous; *stig.* 2-lobed, often tufted. *Caps.* 2-celled, dehiscent along the margin. *Seeds* usually pubescent, sometimes tufted at one end.

Seeds tufted at the apex.

Wings conspicuously pointed. 1. *P. longicaulis*.

Wings obtuse or barely pointed.

Crest of keel composed of a single pair of ovate-lanceolate lobes. . . 2. *P. exserta*.

Crest of keel with a conspicuous double series of 3-4 lobes. 3. *P. adenophora*.

Seeds not tufted.

Fls. in dense cylindrical spikes. 4. *P. Timoutou*.

Fls. in more or less loose racemes.

Stems pubescent.

Caps. glabrous. 5. *P. bryzoides*.

Caps. hairy.

Lvs. mostly ovate, 2.5 cm. long 6. *P. retifera*.

Lvs. linear, 4-6 mm. long. 7. *P. appressa*.

Stems having many stalked glands . . 8. *P. paniculata*.

* The manuscript was critically read by Mr. N. Y. Sandwith of Kew.

1. *P. longicaulis* H. B. K.

Urb. Symb. Ant. 4:336: Gr. Fl. 27.

Annual up to 60 cm. high; *stem* slender, erect, sparsely branched, glabrous; *lvs.* subsessile, mostly linear-pointed, 1-nerved, glabrous, 5-15 mm. long, and about 1 mm. wide; *fls.* reddish-purple, in terminal, compact, subglobose, depressed racemes, the latter 5-10 mm. long by 10-14 mm. wide, not including the flower-bearing axis from which the flowers have fallen; *pedi.* about 3 mm. long; *bracts.* minute, awl-shaped, glandular; *sep.* the three outer narrowly ovate, conspicuously pointed, the upper about twice as large as the two lower, glandular, the *wings* much larger than the outer sepals, about 5 mm. long, oblong-elliptical, conspicuously pointed, narrowing to the base, 3-nerved, with a few small glands at the back; *keel* yellow, about as long as the wings, with a *crest* of 3-4 pairs of purplish tipped lobes; *caps.* white, ovate, about 3 mm. long; *seeds* conical, covered with silky hairs and with a thick tuft at the apex; *aril* minute, 2-lobed.

Aripo and Piarco Savannahs, Trinidad.

West Indies, Cent. and S. America.

2. *P. exserta* Blake.

Cont. Gray Herbm. New Series. 47. 95.

P. brachyptera var. *subecristata* Chod.*P. ephemera* Chod.

Annual up to 45 cm. high, *stem* erect, simple or branched, glabrous; *lvs.* linear, 4-16 mm. long, up to 1 mm. wide, pointed; *fls.* rosy, in dense, obtuse racemes, 7-12 mm. thick; *sep.* oblong, obtuse, about 2 mm. long; *wings* oblong, about 5 mm. long, barely pointed or obtuse, 3-nerved; *keel* slender, longer than the wings; the *crest* of one pair of lobes; *caps.* narrowly oblong-ovate, nearly 4 mm. long; *seeds* hairy, tufted at the apex, about 2 mm. long; *aril* minute, the lobes linear, appressed.

Endemic. Piarco and Aripo Savannahs and Fort George, Trinidad.

3. *P. adenophora* DC.*P. variabilis* of Hart's List.

N. Amer. Fl. 25. 361.

Annual up to 45 cm. high, *stem* erect, simple or branched, glabrous; *lvs.* linear, 4-16 mm. long, to 1 mm. wide, pointed; *fls.* rosy, in dense, obtuse racemes, 7-12 mm. thick; *sep.* oval to ovate, barely pointed or obtuse, about 2 mm. long, *wings* narrowly elliptical, about 5 mm. long, barely pointed or obtuse, 3-nerved; *keel* slender, longer than the wings, the *crest* on each side of a double row of 3-4 lobes, the inner series linear, the outer long-spathulate;

caps. narrowly elliptical, nearly 4 mm. long; *seeds* obconical, hairy, tufted at the apex, about 2 mm. long; *aril* minute, the lobes united into one.

Represented in Herb. Trin. by a specimen mounted together with *P. exserta* on No. 2932, Britton. Aripo Savannah, Trinidad.

Brit. Honduras. Venezuela to French Guiana.

4. *P. Timoutou* Aubl.

Aubl. Pl. Guiana. 737: N. Amer. Fl. 25. 353.

Annual up to 20 cm. high; *stem* simple or branched, glabrous, wing-angled; *lvs.* the lower mostly in whorls of three, those above alternate or opposite, obovate or elliptical, shortly pointed, 4-10 mm. long, 3-4 mm. wide; *fls.* reddish-purple, about 3 mm. long, in terminal, compact, cylindrical spikes, 1-6 cm. long; *sep.* 2 lanceolate and 1 larger, oblong, subacuminate, much smaller than the rounded wings, the latter about 2.5 mm. long, by 2 mm. wide; *keel* yellow, about 2.5 mm. long, *crest* with 2-3 pairs of lobes; *caps.* ovate, notched; *seeds* black, oval, pubescent, about 1 mm. long; *aril* 2-lobed, the lobes almost as long as the seed.

Aripo and Piarco Savannahs, and Guanapo, Trinidad.
Cent. and S. America.

5. *P. bryzoides* St. Hil.

P. angustifolia H.B.K. *P. americana angustifolia* Kuntze.
N. Amer. Fl. 25. 340.

Annual up to 45 cm. high; *stem* slender, sparsely branched, differing in hairiness from short incurved pubescence to longer, stiffer hairs; *lvs.* linear to lanceolate, acuminate or acute at each end, more or less sparsely incurved pubescent, 1-nerved, 2.5-4.5 cm. long by 3-12 mm. broad; *racemes* axillary or opposite to the leaves, 1.5-7 cm. long; *fls.* pinkish and greenish; *sep.* ovate-oblong, two united almost to the tips, the margins sparsely hairy, minute, the wings larger, broadly obovate, persistent on the fruit, 3-4 mm. long, with a rounded and notched apex; *keel* entire or slightly toothed, about as long as the wings; *caps.* oblong-oval, notched at the apex, the margin winged, about 3 mm. long; *seeds* densely hairy.

St. Ann's Fort George and Laventille, Trinidad.

P. bryzoides var. *latifolia* St. Hil. Distinguished by broader leaves, longer hairs on the stems and larger flowers and seeds than those from the northern hills.

Herb. Trin. 7400 and 8466, Icacos and Cedros, Trinidad.
Northern South America.

6. *P. retifera* Blake.

P. americana Mill. of Hart's List.

Cont. U.S. Nat. Herbm. 20. 527.

Sub-shrub, about 18-35 cm. high, sparsely branched; *stems* pubescent; *lvs.* shortly-petioled, ovate or elliptical, pointed, sparsely pubescent on both sides, conspicuously reticulate, especially beneath, 2-5 cm. long, 0.5-2.5 cm. broad; *fls.* in terminal, loose racemes, shortly pedicellate, sparsely hairy; *sep.* lanceolate, about 3 mm. long, wings obovate-oblong, exceeding the keel, 5-7 mm. long; *keel* entire; *caps.* oval-oblong, flat, pubescent, deeply notched at the apex, about 1 cm. long; *seeds* obconical, 4 mm. long, pubescent, with a notched, produced aril.

Herb. Trin. 4033 and 1600, Look-out Hill, Port-of-Spain, Trinidad.

Venezuela.

7. *P. appressa* Benth.

Hook. Journ. Bot. 4. (1842) 100.

Annual up to 25 cm. high, glabrous, not glandular, *stem* branched above; *lvs.* remote, linear, 4-6 mm. long, 0.5-1.5 mm. broad, acute; *racemes* spike-like, elongated, somewhat lax; *fls.* purplish, *wings* obovate, 1.5-2 mm. long, scarcely exceeding the broadly elliptical capsule; *seeds* oblong, hispid.

Aripo Savannah, 11318 and 9072, Freeman, Britton and Williams Trinidad.

Guiana and Brazil.

P. appressa insularis Chod. Fedde. Rep. 14. (1916) 331.

Annual up to 13 cm. high, *wings* and superior *petals* proportionately broader, *seeds* more shortly arilled.

Not seen, Broadway 3274, O'Meara Savannah, Trinidad.

8. *P. paniculata* L.

Annual, 10-30 cm. high; *stems* slender, erect, branched, densely glandular; *lvs.* linear, pointed, up to 2 cm. long; *fls.* rosy or purplish, rarely white, 2-6 mm. long, in loose racemes; *pedi.* about 1 mm. long; *sep.* ovate or ovate-oblong, obtuse, about 1 mm. long, *wings* obovate or oblong-obovate, rounded, wedge-shaped at the base, 3-nerved, about twice as long as the sepals; *keel* 2-2.5 mm. long, the *crest* 3-4 lobed on either side, the two upper *petals* lanceolate-oblong, exceeding the keel; *caps.* elliptical, notched, not winged on the margin, scarcely 2 mm. long; *seeds* pubescent.

Tucuche, Maracas, Trinidad.

W. Indies, Cent. and S. Amer.

2. **ELSOTA** Adans.

Climbing shrubs, the stems woody. *Lvs.* alternate, entire, with stipular glands. *Fls.* in terminal or axillary, paniced racemes. *Sep.* deciduous. *Pet.* 3, united at the base, the lower (the keel) boat-shaped, bi-lobed with a divided crest. *Stam.* 8, united nearly to the apex and adhering to the base of the petals. *Ovary* 1-celled; *ovules* pendulous; *stig.* 2-lobed. *Fruit* winged, 1-celled, indehiscent. *Seeds* glabrous.

Branchlets and under surface of the lvs.
finely pubescent, the hairs mostly
appressed, the fruit finely and
distinctly reticulate 1. *E. diversifolia*.

Branchlets and under surface of lvs
densely and conspicuously pubescent
with spreading hairs.
Fruit thickly covered with blunt crests. 2. *E. lophosoma*.
Fruit with a distinct divided ridge on
either side 3. *E. tenuifolia*.

1. ***E. diversifolia* (L.) Blake.** Easter Flower.

Securidaca erecta Jacq. *E. volubilis* Kuntze.

N. Amer. Fl. 25. 372; Fawc. and Rendl. Fl. Jam. 4. 246.

Climbing shrub, the young stems minutely hairy; *lvs.* variable, ovate, oblong-ovate, elliptical or oblong-elliptical, 2-7.5 cm. long, 2-3.5 cm. wide, usually obtuse, the hairs short and sparse above, dense but fine and inconspicuous beneath; *fls.* reddish-purple; *sep.* elliptical, fringed, about 3 mm. long, the wings unsymmetrical, partially fringed, about 1 cm. long and 8 mm. wide, longer than the keel; *pet.* the two upper with a yellow spot at the throat; *fruit* pubescent, 7-9 mm. long, shortly winged on the upper margin, prominently net-veined and with a terminal wing 3.5-4 cm. long and 11-17 mm. wide at its broadest part, the wing prominently veined, more or less oblong with a thickened upper margin.

On trees and in thickets throughout Trinidad and Tobago.
West Indies, Cent. and S. America.

2. ***E. lophosoma* Blake.**

Bull. Torrey Bot. Club. 53. 467-468.

Scandent shrub, branches slender, densely softly and somewhat yellowish pubescent; *lvs.* oval-ovate or oval-oblong, papery, softly pubescent on both sides, more densely so beneath, 2.5-4.5 cm. long, petioles 1-2 mm. long; *racemes* terminal, in fruit 4 cm. long or less, pubescent like the stem; *fruit* about 6 cm. long, shortly pilose, the cell globose, about 1 cm. long, each side covered with about 5, elevated, anastomosing, thick, blunt crests about 2 mm. high, the upper margin of the cell bearing a repand, denticulate wing margin

about 3 mm. high, this truncate or emarginate at base of proper wing and not decurrent on it, the proper wing obliquely obovate, about 5 cm. long, 7 mm. wide at base, 2 cm. wide above the middle.

Road to Maracas Bay, Trinidad. 11246 (type), in Herb. Trin.

3. *E. tenuifolia* (Chod.) Sandwith, *Kew Bull.* 1929, 79.

Securidaca tenuifolia Chod. in *Bull. Herb. Boiss.* 3:545 (1895).

Elsota chrysotricha Riley in *Kew Bull.* 1927, 119.

E. coriacea (Bonpl.) Blake in *N. Amer. Fl.* 25: 374 (1924).

Climbing shrub, the stems thickly pubescent with spreading hairs; *lvs.* ovate or oblong-ovate, 3.7-8 cm. long, 2.4 cm. wide, obtuse to rounded or sometimes notched at the apex, short and sparse spreading hairs above, densely hairy on the margin and with soft, rather dense, spreading hairs beneath; *petioles* 2.5-4 mm. long; *racemes* rather dense; *fls.* reddish-purple; *sep.* densely hairy outside, 2.5-3.5 mm. long; *wings* densely pubescent without; *fruit* hairy, with distinct, elevated veins, the upper margin obscurely decurrent into the wing; *wing* obovate, 3.7-6 cm. long, 17-22 mm. wide at its broadest part.

Lady Chancellor Road, Trinidad.

Panama to S. America.

Chodat describes a forma *velutina*, *Herb. Trin.* 2703, which I have not seen. *Lvs.* velvety below even in fruiting specimens. *Fruits* large with a netted crested nut, not or scarcely pouched.

3. *BREDEMEYERA* Willd.

Rambling shrubs. *Lvs.* alternate. *Fls.* in terminal panicles. *Pet.* 5, the two lateral reduced to scales. *Stam.* 8, arising from the base of the petals and united into a sheath, free at the apex. *Ovary* 2-celled. *Capsule* compressed, 2-celled, loculicidal. *Seeds* pendulous, enclosed in silky hairs, longer than the seed and arising from a basal wart.

1. *B. lucida* (Benth.) Kl. ex Hassk.

Catocoma lucida Benth.

Gr. Fl. 29.

Lvs. entire, elliptical-oblong or elliptical-lanceolate, reticulate especially on the lower surface, shining and glabrous above, almost glabrous beneath, 12 cm. long by 4 cm. broad, or less; *panicles* many-fl'd., pubescent; *fls.* small, 6 mm. broad, fragrant; *pedi.* about 2 mm. long; *sep.* white, the wings about 3 mm. long, obovate-oblong, rounded, the margin fringed; *pet.* yellow, the two superior, oblong, truncate; the *keel* about as long as the wings; *caps.* wedge-shaped, the apex round-truncate or notched, about 15 mm. long; *seeds* hairy, 6 mm. long.

Hillsides and forests in dry districts. Bocas Islands, Toco, Port-of-Spain, &c., Trinidad.

British Honduras, Guiana and Para.

COHORT 4. CARYOPHYLLINAE.

BY

R. O. WILLIAMS.*

- Sep. 4-5.....1. Caryophyllaceae.
 Sep. 2.....2. Portulacaceae.

FAMILY 1. CARYOPHYLLACEAE.

Herbs, annual or perennial. *Lvs.* opposite, simple, entire, often united at the base by a transverse line. *Stip.* none, or if present small and scarious. *Fls.* perfect, regular, cymose. *Sep.* persistent. *Pet.* as many as the sepals. *Stam.* up to 10, inserted with the petals, free from one another; *anths.* 2-celled, longitudinally dehiscent. *Ovary* superior, sessile or shortly stalked, 1-celled or imperfectly 2-5 celled at the base with free central placentation; *styles* 2-5, free or united below; *ovules* numerous. *Caps.* dry, dehiscent by valves or teeth at the apex.

1. DRYMARIA Willd.

Low *herbs*. *Lvs.* flat. *Stip.* small and scarious. *Fls.* white in terminal cymes. *Sep.* 5, free. *Pet.* 5, 2-fid. *Stam.* 5 or less. *Ovary* 1-celled; *style* simple at the base, 3-fid above. *Caps.* 3-valved.

1. *D. cordata* (L.) Willd. Chickweed.

Holostium cordatum L.

Fawc. and Rendl. Fl. Jam. 3.175: Britt and Wils. Sc. Surv. Porto Rico. 5. 297.

Annual, with creeping and erect, very slender stems, often rooting at the joints; *lvs.* roundish or kidney-shaped, subcordate at the base, usually broader than long, variable in size, 5-25 mm. broad, glabrous, palmately veined, *petioles* 1-3 mm. long; *pedu.* very slender; *sep.* green, lanceolate-elliptical, acute, 2-3 mm long; *pet.* white, shorter than the sepals, deeply bifid; *stam.* white, *fruiting pedicels* sticky-glandular; *caps.* nearly as long as the sepals; *seeds* few (8 or less) 1 mm. long, black, granulose.

A weed of lawns and common in moist shady places. Trinidad. West Indies. Tropics generally.

Doubtful Species.

Stellaria media L.

There is a specimen so labelled in the Trinidad Herbarium bearing no data.

* The manuscript was critically read by Mr. N. Y. Sandwith of Kew.

FAMILY 2. PORTULACACEAE.

Herbs, mostly succulent. *Lvs.* alternate or subopposite. *Fls.* regular, perfect, solitary or clustered at the tops of the branches, or in terminal panicles or racemes. *Sep.* 2, imbricate, adhering to the ovary at the base or free. *Pet.* 4-6, imbricate, free or united at the base, soon withering. *Stam.* indefinite; *anths.* 2-celled, longitudinally dehiscent. *Ovary* superior or half inferior, 1-celled with basal central placentation; *style* 3-7 branched. *Caps.* 3-valved or circumscissile. *Seeds* numerous, kidney-shaped-globose, compressed.

- Fls.* solitary or clustered at the tops of
the branches.....1. *Portulaca*.
Fls. racemose or paniculate.....2. *Talinum*.

PORTULACA 1.

Diffuse or ascending, fleshy *herbs*. *Lvs.* alternate or subopposite, usually in whorls around the flowers. *Stip.* scarious, minute or reduced to hairs. *Fls.* yellow, purple or rose, solitary or crowded at the tops of the branches. *Pet.* 4-6, free. *Stam.* 6-25, inserted at the base of the petals. *Ovary* half inferior; *style* deeply 3-7 parted. *Caps.* membranous, circumscissile. *Seeds* numerous.

- Fls.* yellow.
 Sep. keeled. *Pet.* 5.1. *P. oleracea*.
 Sep. not keeled. *Pet.* 4.....2. *P. quadrifida*.
Fls. purplish3. *P. pilosa*.

1. *P. oleracea* L. Purslane.

Fawe. and Rendl. Fl. Jam. 3.169; Britt. and Wils. Sc. Surv. Porto Rico 5.299; Griseb. Fl. 57.

Annual, glabrous; *stems* fleshy, prostrate or erect, about 3 dm. high, branching at the base; *lvs.* alternate or subopposite above, obovate or cuneate, rounded or obtuse at the apex, up to 3 or 4 cm. long, fleshy; *fls.* clustered or solitary, sessile; *sep.* keeled, acute, 3-5 mm. long; *pet.* 5, yellow, oblong, 4-5 mm. long, 3 mm. broad, rounded at the apex, deeply emarginate or bifid, withering before mid-day; *stam.* 7-12; *style* branches 6; *caps.* 4-7 mm. long, circumscissile about the middle; *seeds* black, 0.8 mm. diam.

Used to some extent as a spinach.

A common weed on waste and cultivated ground. Trinidad. Tobago.

All tropical and temperate regions.

2. *P. quadrifida* L. Chickenweed.

Britt. and Wils. Sc. Surv. Porto Rico. 4.299.

Annual, creeping and rooting at the joints, the *stems* very slender, encircled at the joints with a ring of long white hairs; *lvs.* opposite, fleshy, elliptic or ovate, 3-6 mm. long, 1-3 mm. broad, acute or obtuse at the apex, rounded or acute at the base, barely petioled; *fls.* terminal, solitary, sessile, surrounded by long white hairs and a whorl of 4 leaves, opening at noon; *sep.* oblong, not keeled, acute, 3 mm. long; *pet.* 4, yellow, obovate-oblong to elliptic, obtuse, about 5 mm. long, 3.5 mm. broad; *stam.* 6-8, nearly as long as the petals; *style* 3 or 4 branched; *caps.* circumscissile nearly at the base.

A weed in cultivated ground. Trinidad. Tobago.
Cuba to Trinidad, South America, Trop. Asia.

3. *P. pilosa* L. Jump-up-and-kiss-me.

Griseb. Fl. 57; Fawc. and Rendl. Fl. Jam. 3.170; Britt. and Wils. Sc. Surv. Porto Rico. 5.300.

A fleshy *herb*, up to 15 cm. high, *stems* prostrate or ascending, usually conspicuously woolly in the axils; *lvs.* alternate, narrowly linear-lanceolate, acute, 5-16 mm. long, 1.5-2 mm. broad, succulent with transparent markings; *fls.* in terminal clusters surrounded by wool and by a whorl of about 8 leaves; *sep.* 2, 2.5-3 mm. long, not keeled; *pet.* 5, magenta, obovate, rounded at the apex, emarginate, about 7 mm. long and 4-5 mm. broad; *stam.* 20-24 (in those examined), 2-3 mm. long; *fil.* magenta; *style* usually 4-branched, magenta; *caps.* about 3 mm. diam., circumscissile at or about the middle, covered by the withered corolla.

Coastal lands, Moruga, Monos, Teteron's Bay, Chacachacare, Trinidad. Tobago.

Cuba to Trinidad, Florida, Mexico and S. America.

2. *TALINUM* Willd.

Fleshy, glabrous *herbs*, or somewhat shrubby. *Lvs.* alternate, without stipules. *Fls.* in terminal panicles or racemes. *Sep.* deciduous or persistent. *Pet.* 5. *Stam.* 10-30, adherent to the base of the petals. *Ovary* free; *style* 3-branched. *Caps.* 2-valved. *Seeds* black.

Infl. paniculate; *sep.* deciduous1. *T. paniculatum*.

Infl. racemose or subcorymbose; *sep.* persistent.....2. *T. triangulare*.

1. **T. paniculatum** (Jacq.) Gaertn.

T. patens Willd.

Griseb. Fl. 57: Fawc. & Rendl. Fl. Jam. 3.171: Britt & Wils. Sc. Surv. Porto Rico 5.298.

Herb, somewhat shrubby, up to 7.5 dm. high; *lvs.* elliptical or obovate, 3-8 (or more) cm. long, 1.5-4 cm. broad, obtuse or sometimes acute at the apex, tapering at the base; *fls.* in a terminal, many-fld. panicle 7-40 cm. long; *sep.* deciduous, 3-4 mm. long; *pet.* red, pink or yellowish, 4-5 mm. long; *stam.* 15-20; *caps.* 3-5 mm. diam.

Rocky hillsides, Monos and Chacachacare, Trinidad. Little Tobago, Tobago.

Cuba to Margarita, S. United States and Cont. Trop. America.

2. **T. triangulare** Willd. Purslane. Sweetheart.

Griseb. Fl. 56: Fawc. and Rendl. Fl. Jam. 3.172: Britt and Wils. Sc. Surv. Porto Rico 5.298.

Herb, succulent, up to 7 dm. high; *lvs.* alternate, oblanceolate to obovate, rounded or acute at the apex, tapering at the base, 2-6 cm. long, 1-2.5 cm. broad; *infl.* few fld., racemose or subcorymbose; *sep.* 2, persistent, keeled, subpetaloid, unequal, acute or acuminate, 5-7 mm. long; *pet.* 5, pink or yellow, obovate to obovate-oblong, rounded at the apex and minutely mucronate, about 12 mm. long, 7-8 mm. broad; *stam.* about 30; *fil.* pink; *style* 3-branched, the branches pink; *caps.* globose, about 5 mm. diam.

Rocks, Teteron's Bay, Gasparee, Chacachacare, Trinidad. Tobago. Jamaica, Porto Rico to Margarita. S. America.

COHORT 5. GUTTIFERALES.

BY

R. O. WILLIAMS.*

- Lvs. opposite or whorled.
 Lvs. with stipules..... 1. Quinaceae.
 Lvs. without stipules.
 Stam. united into 5 bundles..... 2. Hypericaceae.
 Stam. free or united into a mass.. 3. Guttiferae.
 Lvs. alternate.
 Woody vines, sometimes epiphytic;
 infl. with modified pitcher-like
 bract 4. Marcgraviaceae.
 Trees or shrubs; infl. without pitcher
 bracts..... 5. Theaceae.

FAMILY 1. QUINACEAE.

Shrubs, trees or climbers. Lvs. opposite or whorled, simple or pinnately lobed, lateral nerves numerous, tertiary nerves feather-veined. Stip. in pairs, interpetiolar, rigid or foliaceous. Fl. polygamous or dioecious, in panicles or racemes. Sep. 4-5, overlapping in pairs, small, unequal. Pet. 4-8, overlapping. Stam. 15-30 or more, free or nearly so; anths. 2-celled, opening longitudinally. Ovary 2-11-celled; styles 2-3, free, with disk-like stigmas; ovules in pairs, ascending. Fruit a 1-seeded berry. Seed woolly.

1. QUINA Aubl.

Fls. small. Stam. 15-30, hypogynous; ovary 2-4 celled, free. Stigmas obliquely peltate.

- Lvs. rounded at the base; stip.
 persistent and much longer than the
 very short petiole..... 1. *Q. guianensis*.
 Lvs. tapering at the base; stip.
 deciduous, much shorter than the
 petiole..... 2. *Q. Cruegeriana*.

1. *Q. guianensis* Aubl.

Gr. Fl. 106; Aubl. Pl. Guiana t. 379.

A tree, branchlets glabrous; lvs. opposite, elliptic-oblong, 7-25 cm. long, 4-9.5 cm. broad, more or less pointed at the apex and tapering to the rounded base, entire or repand, glabrous,

* The manuscript was critically read by Mr. N. Y. Sandwith, of Kew.

stiffly papery, barely petioled; *stip.* persistent, linear, acuminate, about 1 cm. long, at length much exceeding the very short petiole; *fls.* unisexual, in axillary cymes, divided from the base; *pedi.* about 1 cm. long; *sep.* 4, fringed, about 2 mm. long; *pet.* 5-8, about 3 mm. long; *styles* 2; *berry* elliptical, tapered at both ends, about 12 mm. long, usually 1-seeded by abortion, tardily dehiscent.

Herb. Trin. 400 and 2528, Crueger, Irois, Trinidad.
Guiana.

2. *Q. Cruegeriana* Griseb.

Gr. Fl. 106.

A shrub or low tree, branchlets rusty-downy; *lvs.* opposite, oblong, up to 40 cm. long and 15 cm. broad, entire or repand with a bluntish point at the apex, tapering at the base, leathery, with minute deciduous rusty brown hairs on both sides; *petioles* rusty-downy, 8-16 mm. long, channelled above; *stip.* deciduous, much exceeded by the petiole; *fls.* polygamous, in axillary compound clusters, nearly as long as the petiole; *pedi.* about 3-4 mm. long; *sep.* 5, about 2 mm. long, roundish; *pet.* 5, about 4 mm. long, obovate, yellow; *berry* obovate, about 12 mm. long, 1-4-seeded, tardily dehiscent.

Forests and river banks in moist districts, Trinidad. Endemic.

FAMILY 2. HYPERICACEAE.

Herbs, shrubs or trees, rarely climbers. Lvs. opposite or whorled, simple, entire or glandular-dentate, without stipules. *Fls.* regular, hermaphrodite, usually terminal, yellow or white. *Pet.* overlapping or contorted. *Stam.* numerous, hypogynous, often united into bundles; *anths.* 2-celled, opening longitudinally. *Ovary* more or less perfectly 3-5-celled; *styles* slender, usually free; *ovules* numerous, axile or pendulous. *Fruit* various. *Seeds* without arils.

1. *VISMIA* Vell.

Shrubs or trees. Lvs. opposite. *Fls.* in terminal panicles. *Sep.* 5. *Pet.* 5, villous within; *scales* 5, alternating with the petals. *Stam.* numerous, in 5 bundles, the bundles hairy, opposite the petals. *Ovary* 5-celled; *ovules* numerous; *styles* 5, distinct. *Berry* indehiscent, 5-celled; *seeds* numerous.

Sep. glabrous or nearly so.....1. *V. cayennensis.*

Sep. densely rusty-downy.

Lvs. minutely dotted above, the dots

not transparent.....2. *V. falcata.*

Lvs. with transparent dots.....3. *V. guianensis.*

1. *V. cayennensis* Pers. Kiskidee.

Gr. Fl. III.

Small tree, branchlets glabrous; *lvs.* elliptical or elliptical-oblong, tapered at both ends, up to 14 cm. long and 6 cm. broad, the apex acuminate, entire, glabrous, with black dots beneath, conspicuously reticulate, especially on the lower surface, *petiole* 5-8 mm. long; *panicles* few-fl.; *sep.* glabrous, ovate-oblong, bluntish, about 6 mm. long; *pet.* oblong-obtuse, yellow outside, dotted with brown, woolly within, about 1 cm. long; *berry* oblong, about 1 cm. long, the persistent *sepals* strongly reflexed, *styles* persistent.

General on savannahs and in forests, Trinidad. Tobago.
Tropical South America.

2. *V. falcata* Rusby.

Descr. N. Sp. S. Am. Pl. 59. (1920).

V. ferruginea Gr. in part, not H.B.K.

Riley in Kew Bull. (1925). 134.

Small tree, the branchlets densely rusty-downy; *lvs.* spear-head shaped, gradually narrowed to the apex, rounded at the base, up to 20 cm. long and 8 cm. broad, entire, minutely dotted (the dots not pellucid) and glabrous or with deciduous hairs above, densely and minutely rusty-downy beneath, *petioles* 1-2 cm. long; *panicle* many-fl., densely rusty-downy; *sep.* oblong, obtuse at the apex, densely rusty-downy outside, glabrous within, about 7 mm. long; *pet.* obovate, about 1 cm. long, glabrous outside, woolly within, the *scales* woolly; *berry* subglobose exceeded by the persistent *sepals* which are not reflexed; *styles* persistent.

This species has sometimes been confused with *V. ferruginea* Kunth, which is described as having elliptic-oblong leaves, $4\frac{1}{2}$ inches long and is not known to occur in Trinidad or Tobago.

Northern Mountain Range, Trinidad. Roxborough-Parlatuvier Road, Tobago.
Orinoco Delta.

3. *V. guianensis* Pers.

Aubl. Pl. Guiana 2.784 t. 311.

Small tree about 7 m. with scarlet juice; *lvs.* ovate-oblong, acute or acuminate, more or less wedge-shaped at the base, up to 12 cm. long and 4.5 cm. broad, entire, glabrous and smooth above, minutely and densely rusty-downy beneath, with many transparent dots, *petioles* about 1 cm. long; *cal.* oblong, acute, or obtuse, 6 mm. long, densely rusty-downy outside, glabrous within; *pet.* pale yellow, glabrous outside, woolly within, about 12 mm. long; *berry* subglobose, exceeding the persistent *sepals* which are not reflexed, *styles* persistent.

Forests in wet or moist districts, Trinidad.
St. Vincent, Guiana and Brazil.

FAMILY 3. GUTTIFERAE.

Shrubs or *trees* sometimes epiphytic, with resinous sap. *Lvs.* opposite, rarely whorled, leathery, simple, entire, without stipules. *Fls.* terminal or axillary, usually regular, polygamous-dioecious or rarely hermaphrodite. *Sep.* 2-6, rarely more, widely overlapping, persistent. *Pet.* the same number, contorted or sometimes overlapping. *Male fls.*: *Stam.* numerous, very rarely definite, hypogynous; *fil.* variously united or distinct, sometimes forming a fleshy mass, or united into bundles, opposite the petals, with or without a rudimentary ovary. *Female* or *hermaphrodite fls.*: *Staminodes* or *stamens* surrounding the ovary often definite or fewer in number and not combined to the same extent as those of the male fls. *Ovary* sessile, superior, 1 to many celled; *ovules* 1 to many in each cell, attached to the central angle, or erect from the base of the cells. *Stigmas* various, sometimes radiating. *Fruit* dehiscent or not, sometimes large and globose, *seeds* often with arils.

Fruit dehiscent.

Ovules numerous in the cells.

Stam. numerous.

Lvs. without transparent dots,
fruit globose or nearly so. 1. *Clusia*.

Lvs. with transparent dots and
lines, fruit elongated. 2. *Marila*.

Stam. 4 (in the *Trinidad* sp.) 3. *Havetiopsis*.

Ovules solitary in the cells. 4. *Tovomita*.

Fruit indehiscent.

Stam. united into a tube. 5. *Symphonia*.

Stam. free or united only at the base.

Fruit 10-15 cm. diam. 6. *Mammea*.

Fruit less than 6 cm. diam.

Lvs. rounded at the apex, seeds
globose 7. *Calophyllum*.

Lvs. pointed at the apex, seeds
ellipsoid 8. *Rheedia*.

1. *CLUSIA* L.

Evergreen *trees* or *shrubs* with resinous sap, usually glabrous throughout, often epiphytic or twining on other trees. (The seeds often germinate in the forks of the branches from whence they send their roots to the ground and eventually smother their host.) *Lvs.* opposite, entire, leathery, usually with many pinnate nerves. *Fls.* usually polygamous, borne at the ends of the branches,

large and solitary or few, or smaller and in paniced cymes. *Bracts* 2-6. *Bractzoles* 2-14, decussate in pairs, sepal-like, but smaller. *Sep.* 4-6, roundish, overlapping. *Pet.* 4-9, overlapping. *Male fls.* : *Stam.* indefinite, usually numerous, more or less united. *Female fls.* : *Staminodes* few or many. *Ovary* 4-12 celled; *stigmas* radiating, sessile or with short thick styles; *ovules* indefinite, many in each cell. *Caps.* leathery or fleshy, septicidally dehiscent, the axis angular winged. *Seeds* enclosed in a fleshy aril.

Lvs. sessile, or the petiole 1 cm. long or less and winged.

Lvs. orbicular-obovate 1. *C. intertexta.*

Lvs. obovate..... 2. *C. tocuchensis.*

Lvs. with the petiole exceeding 1 cm. and not winged.

Lvs. elliptic or elliptic-oblong 3. *C. nemorosa.*

Lvs. obovate or narrowly obovate.

Fruit 2 cm. diam. or less.

Pedu. short, 3-5 mm., *pedi.* also short 4. *C. minor.*

Pedu. long, 15-25 mm., *pedi.* also long 5. *C. aripoensis.*

Fruit 5-8 cm. diam.

Lvs. thick, veins barely prominent, anastomosing some distance from the margin in an undulating manner 6. *C. rosea.*

Lvs. thinner, veins more numerous, and anastomosing close to the margin..... 7. *C. palmicida.*

1. *C. intertexta* Britt. Mountain Mangrove.

Bull. Torr. Bot. Club. 50. 52.

Tree, forming impenetrable masses with interlocking aerial roots; *lvs.* orbicular-obovate, 10-14 cm. long, 10-11.5 cm. broad, thickly leathery, rigid, the apex rounded, the base somewhat wedge-shaped and extending down the very stout petiole, lateral veins many, about 4 mm. apart, prominent on the upper surface; *petioles* 1 cm. long or less; *infl.* several-fld., its branches stout; *bracts* 2-3 cm. long; *buds* globose, glabrous; *fruit* (immature) oblong-ovoid, beaked, about 2.5 cm. long; *stigmas* 6 or 7.

Herb. Trin. 9786, Heights of Aripo, Trinidad. Endemic.

2. *C. tocuchensis* Britt.

Bull. Torr. Bot. Club. 48. 333.

A *tree* about 18 m. high, the twigs rather stout; *lvs.* obovate, leathery, rigid, glabrous, up to 17 cm. long, and 4-8.5 cm. wide, rounded at the apex, wedge-shaped at the base, extending into

the short, stout petiole, the veins prominent on both sides; *petiole* about 5 mm. long; *fruit* globose, 10-15 mm. diam.; *carps.* about 7; *styles* stout, 3-4 mm. long; *stigmas* 6-8, flat, obliquely oblong, the centre depressed.

Britton, Hazen and Mendelson, 1247, in *Herb. Trin.*, Forest, Mount Tucuche, Trinidad. Endemic.

3. *C. nemorosa* Mey.

Trees 16 m.; *lvs.* elliptic or elliptic-oblong, acute or sometimes obtuse at the apex, 12.5-16.5 cm. long, 7-8.5 cm. broad, leathery, the veins prominent on both sides, *petioles* 2-3 cm. long; *fls.* white, bright scarlet at the base within for about one-third of their length, 5.5 cm. diam.; *sep.* white, rounded, about 8 mm. long; *pet.* 4-6, obovate-oblong, 2.5 cm. long by 1.5 cm. broad; *fil.* free nearly to the base; *bracts* about 4 mm. long; *fruit* ovoid, purplish, 5-7 valved, 3 cm. long; *stigmas* 5-7; *sep. on fruit* about 10 mm. long and 13 mm. broad; *seeds* about 8 mm. long.

Aripo Savannah and Woods near Caroni River, Trinidad.
Guiana, Brazil.

4. *C. minor* L.

Britt. and Wils. *Sc. Surv. Porto Rico*. 5. 585.

Shrub or tree up to 10 m., the branches slender; *lvs.* obovate, 6-11 cm. long, somewhat thin (as compared with the other spp.) the *apex* obtuse or rounded, the base wedge-shaped, veins slightly prominent above, distinctly so beneath, *petioles* slender, 1-2.5 cm. long; *infl.* few fld.; *fls.* 2.5 cm. diam., *pedu.* and *pedi.* very short, 3-5 mm. long; *sep.* 4, 6-7 mm. broad; *pet.* 4 or 5, broadly ovate, white or pale pink, shiny, 10-12 mm. long; *anths.* sessile on the female fls.; *fruit* sub-globose or obovoid, 1.5-2 cm. long; *stigmas* 6 or 7; *fruit* 6 or 7-valved; *seeds* 3.5-4.5 mm. long.

Gasperee, Arima, Marabella, Cedros and Madras Settlement Road, Trinidad. Arnos Vale Road and Eggers 3666, Cinnamon Hill, Tobago.

Porto Rico, Cuba, Hispaniola, Dominica to Trinidad. *Cont. Trop. America.*

5. *C. aripoensis* Britt.

Bull. Torr. Bot. Club. 50. 53.

Tree with slender twigs; *lvs.* narrowly obovate, 7-13 cm. long, 2.5-5.5 cm. broad, the apex obtuse, the base wedge-shaped, leathery, the veins slightly prominent on the lower side, almost wholly obscure above, *petioles* rather slender, 1-3 cm. long; *infl.* twice trichotomous; *pedu.* up to 2.5 cm. long, one of the subtending

bracts being sometimes foliaceous; the *peduncles* of each of the cymes are 3-4.5 cm. long, and the final pedicels 2-4.5 cm.; *sep.* 4-5, up to 1.3 cm. long and 1 cm. broad; *pet.* 5, 1.5-2 cm. long; *stigmas* 5; *fruit* obovoid, 2.8 cm. long, 2 cm. diam.

Herb. Trin. 9785, Broadway, Forests, Heights of Aripo, and 5527 and 5598, Blanchisseuse Road, Trinidad. Endemic.

6. *C. rosea* Jacq. Matapal. Scotch Attorney. Parrot Apple.
Gr. Fl. 107: Britt. and Wils. Sc. Surv. Porto Rico. 5. 586:
Fawc. and Rendl. Fl. Jam. 5. 192.

Tree up to 20 m., often growing on trees or rocks; *lvs.* obovate, rounded or rounded-retuse at the apex, wedge-shaped, obtuse or narrowed, often oblique and rounded at the base, 9-18 cm. long, the margin scarcely recurved, thick, rigid, leathery and glabrous, the veins slightly prominent on both sides, often practically invisible on the upper surface, anastomosing in an undulating manner at a little distance from the margin; *petioles* 1-2 cm. long; *fls.* solitary or in twos or threes together, or sometimes a solitary terminal flower with 2 lateral 3-flowered cymes; *bracteoles* 2-4, smaller than the sepals; *sep.* 4-6, 2 cm. long or less; *pet.* 6-8, white or rose, obovate or nearly orbicular, 3-4 cm. long; *male fls.*: *stam.* the outer fertile in several series, united at the base into a cup or ring, the inner united into a solid resinous mass; *female fls.*: *staminodes* united and forming a cup; *stigmas* 6-9; *fruit* globose, whitish, 5-8 cm. diam., 6-8-celled.

Herb. Trin. 4596, Craig Island: 2522 and 11677, Trinidad.
Eggers, 5803, Great Dog River, Tobago.

West Indies, Cont. Trop. America.

7. *C. palmicida* L. C. Rich. ex. Pl. and Tr. Matapal.
C. Martinii Sagot.
Mart. Fl. Bras. 3. 1.425.

Trees; *lvs.* obovate or oblanceolate, 10-20 cm. long, 5-10.5 cm. broad, the apex obtuse, the base usually acutely-cuneate, rigid, leathery, the veins numerous, prominent on both sides and anastomosing extremely close to the margin, the line of junction being parallel with the margin; *petioles* somewhat slender, 2-4.5 cm. long; *fls.* usually twice trichotomous, very fragrant; *sep.* about 12 mm. broad; *pet.* broadly obovate, 4.5 cm. long, 4 cm. broad, irregularly lobed.

Herb. Trin. 6496, 2521 and 9788, Broadway, Heights of Aripo, Balandra Bay, La Brea, Irois, Arima, Trinidad. 4601, Broadway, Easterfield, Tobago.
Guiana.

DOUBTFUL SPECIES.

C. major depressa Kuntze.

No. 979, Otto Kuntze, Pitch Lake, Trinidad was referred in Kuntze's Revisio, p. 61 as above. It is probably *C. rosea* or *C. palmicida*.

2. **MARILA** Sw.

Trees. Lvs. opposite, the veins anastomosing at the margins. Fls. in axillary racemes. Sep. 4-5. Pet. 4-5, overlapping. Stam. numerous; anths. linear, erect, with a terminal gland. Ovary 4-5 celled; style simple; stig. thick, barely lobed; ovules numerous. Caps. elongated, septicidally dehiscent. Seeds numerous.

Lvs. with transparent dots and lines. ... 1. *M. racemosa*.

Lvs. with transparent dots only..... 2. *M. grandiflora*.

1. **M. racemosa** Sw.

Gr. Fl. III.

Shrub about 5-7 m. high, glabrous; lvs. oblong-lanceolate, 10-25 cm. long, 2.5-7.5 cm. broad, pointed at both ends, dotted with transparent dots and points; fls. in simple racemes; sep. 5, about 5 mm. long, slightly shorter than the petals; pet. greenish-white; anths. oblong; style very short; stig. capitate; caps. siliquiform, incurved; seeds fringed, chiefly at both ends.

No local specimen seen. Trinidad ex. Gr.

St. Kitts to St. Vincent.

2. **M. grandiflora** Gr. Red Mangue.

Gr. Fl. III.

Shrub or small tree; branchlets and peduncles flattened, more or less rusty with short down; lvs. oblong, 45 cm. long by 12.5 cm. broad, tapering at the apex, rounded or obtuse at the base, glabrous, the primary veins prominent beneath, dotted with pellucid points, without lines; petioles about 2.5 cm. long; fls. in rather loose racemes, somewhat compound below; pedi. 2.5-3 cm. long, slightly reflexed; sep. 4-5, about 1 cm. long, ovate, more or less obtuse, shorter than the stamens, rusty-woolly outside; pet. slightly longer than the sepals, obtuse; stam. very numerous; anths. linear, 3-6 mm. long, with a minute whitish terminal gland; stig. 4, sessile, globose; caps. oblong, 4-valved, the valves at length reflexed from the central 4-lobed column; sep. persistent, reflexed; seeds oblong, minute.

Common in the Northern Mountain Range. Trinidad. Endemic.

3. HAVETIOPSIS *Pl. and Tr.*

Trees with the habit of *Clusia*. *Fls.* dioecious or polygamous, small, in terminal somewhat cymose trichotomous panicles. *Sep.* 4, decussate. *Pet.* 4, decussate. *Male fls.*: *Stam.* 4, 8 or 12, somewhat free or connate at the base; *fil.* short; *anths.* erect. *Female* or *hermaphrodite fls.*: *Stam.* or *staminodes* 4 or 8. *Ovary* 4-celled; *style* very short; *stig.* discoid, small; *ovules* 4-8 in each cell. *Caps.* fleshy, 4-celled.

1. *H. flavida* (Benth.) *Pl. and Tr.*

Havetia flavida Benth.

Shrub; *lvs.* obovate to lanceolate, rounded at the apex or minutely pointed, wedge-shaped at the base, 4-7.5 cm. long, 2-5 cm. broad, the nerves slightly prominent on both sides, glabrous; *petioles* 3-8 mm. long; *panicles* 5 cm. long or more, spreading; *bracts* and *bracteoles* minute, concave, acute; *male fls.*: *stam.* 4, subsessile on the disk; *anths.* 2-celled, the dehiscence introrse; *female fls.*: *sep.* and *pet.* rounded, 2-3 mm. long; *staminodes* 4, opposite the petals, about 2 mm. long and about as long as the pistil; *fil.* broad, 0.5 mm. long, narrowing at the apex; *anths.* small, 2-celled, subglobose, longitudinally dehiscent; *stig.* sessile, 4-lobed; *ovary* 4-celled; *fruit* globose, about 1 cm. diam., *stig.* 4, separated, black, persistent; *sep.* 3 mm. long; *seeds* red.

Herb. Trin. 5094. Alexander; Williams, Aripo Savannah, and 11722 Broadway, Mora Forests Gravel Pit. Trinidad. Guiana.

4. TOVOMITA *Aubl.*

Trees or *shrubs.* *Lvs.* glabrous. *Fls.* usually small, in terminal and axillary cymes, dioecious or polygamous. *Sep.* 2-4. *Pet.* 4-10, overlapping. *Stam.* numerous, free, the *filaments* thickened; *anths.* small. *Stig.* 4-5, subsessile. *Caps.* fleshy, 4-5-celled and 4-5-valved. *Seeds* solitary in the cells.

1. *T. Eggersii* Vesque.

T. amazonica Gr. not Walp.

Small *tree*; *lvs.* elliptical-oblong, obovate or oblanceolate, obtuse or abruptly pointed at the apex, wedge-shaped at the base, 5-20 cm. long, the numerous veins prominent beneath, *petioles* 1-2 cm. long; *infl.* about 2.5 cm. long or shorter; *fls.* white, about 7 mm. diam.; *sep.* 4; *pet.* 4, oblong, green, about 5 mm. long; *stam.* white, 3 mm. long or less; *fruit* ovoid, about 2.5 cm. long and 1.8 mm. broad; *seeds* 17 mm. long and 11 mm. broad.

This plant has sometimes been confused with *T. guianensis* Aubl. but all the Trinidad material, including that from Fort George, differs primarily from Aublet's figure by the very close and more numerous nerves which continue to the margin. Herb. Trin. 5562, Maraval (lvs. only) has somewhat larger leaves but does not otherwise differ.

Forests in wet or moist districts, Trinidad. Endemic.

5. SYMPHONIA L.

Trees or shrubs with yellowish sap. *Lvs.* thinly leathery, the pinnate parallel nerves close together. *Fls.* perfect, terminal, generally scarlet, rather large, subumbellately paniculate or rarely solitary. *Sep.* 5, overlapping. *Cor.* globose, larger than the calyx and formed of 5 petals. *Stam.* united into a tube with 5 narrow lobes above, each bearing 3 or 4, linear, adhering, parallel anthers outside below the apex. *Ovary* enclosed in the staminal column, 5-celled; *style* long, radiately 5-lobed at the apex, the *stig.* minute; *ovules* numerous. *Berry* globose or ovoid, indehiscent. *Seeds* few, sometimes solitary, the coat thin and veiny.

1. *S. globulifera* L. fil. Yellow Mangue.

Fawc. and Rendl. Fl. Jam. 5. 198.

Moronobea coccinea Aubl. t. 313 (in part).

Tall *tree* up to 30 m.; *lvs.* lanceolate, oblanceolate or oblong-elliptical, the apex acuminate, the base more or less wedge-shaped, 5-18 cm. long, 2-6.2 cm. broad, glabrous, *petioles* 3-12 mm. long; *fls.* and buds brilliant scarlet in terminal clusters on short horizontal branches; *sep.* rounded, crimson, 4-5 mm. long; *pet.* scarlet, rounded, about 15 mm. long, 22 mm. broad, concave, lobed on one side; *staminal column* 10-15 mm. long, red as also the lobes; *anths.* black; *style* and lobes pale yellow; *fruit* ovoid or globose, 1.5-3.5 cm. long; *seed* solitary, 12-20 mm. long.

The tree yields a gum from incisions made in the bark, stated by Macfadyen to be a good illuminant and well adapted for mixing with lard, wax and rosin for making an ointment for treating indolent sores.

Maraval, Arima, Aripo district and Quare River, Trinidad.

Jamaica, Hispaniola, Guadeloupe, Dominica, St. Lucia, Trop. Cont. America.

6. MAMMEA L.

Trees. *Lvs.* evergreen, rigidly leathery, pinnately veined and with the reticulation prominent. *Fls.* polygamous, stalked, solitary or clustered in the axils. *Cal.* united in the bud, splitting

later into two valvate sepals. *Pet.* 4-6. *Stam.* numerous, free or united at the base; *fil.* threadlike; *anths.* erect, oblong, 2-celled, longitudinally dehiscent. *Ovary* 2-celled, each cell with two ovules or 4-celled, each cell with one ovule; *style* short; *stig.* peltate, entire or broadly 4-lobed. *Fruit* a large, 2-4 seeded drupe.

1. *M. americana* L. Mammee Apple. Mammee Sapote.

Tree up to 25 m.; *lvs.* elliptic or elliptic-obovate, the apex rounded, the base wedge-shaped, obtuse or rounded, 10-25 cm. long, 5-12 cm. broad, glabrous, *petioles* stout, 8-15 mm. long; *pedu.* about 1 cm. long; *sep.* 10-15 mm. long; *pet.* white, obovate, about 2 cm. long; *fruit* 10-15 cm. diam., globose, apiculate, russet-coloured, the skin 4-5 mm. thick, the flesh thick and yellow; *seeds* 2-4, with a reddish-orange fibrous coat, about 7 cm. long and 5.5 cm. broad.

The mesocarp is used for preserves and the reddish-brown wood is hard and durable but not plentiful enough to be in common use.

Doubtfully native, El Paraiso, Tabaquite, and generally grown throughout Trinidad and Tobago.

West Indies, Colombia and Guiana.

7. *CALOPHYLLUM* L.

Tress. *Lvs.* leathery, shining, with numerous pinnate, parallel nerves. *Fls.* polygamous, in axillary or terminal racemes or panicles. *Sep.* 2-4. *Pet.* none to 4. *Stam.* numerous, free or barely united at the base; *fil.* short, thread-like; *anths.* ovate or oblong, 2-celled, longitudinally dehiscent. *Ovary* 1-celled; *style* long or short; *stig.* peltate. *Fruit* a drupe, the shell hard and brittle. *Seed* one, ovoid or globose.

1. *C. antillanum* Britt. Galba. Santa Maria.

Britt. and Wils. Sc. Surv. Porto Rico. 5. 584.

C. calaba Jacq. Sel. Stirp. Amer. 269. t. 165. not L.

C. Jacquinii Fawc. and Rendl. Fl. Jam. 5. 200.

A tall *tree* with yellowish sap; *lvs.* elliptic or oblong-elliptic, rounded, obtuse or somewhat emarginate at the apex, obtuse or wedge-shaped at the base, 7-15 cm. long, 3.5-7 cm. broad, glabrous; *racemes* axillary, 3-5 cm. long, few-fl'd.; *pedi.* 4-10 mm. long; *fls.* white, fragrant; *male fls.*: *sep.* 4, in pairs, white, rounded, concave, the inner pair 5-7 mm. long, about twice as long as the outer pair; *pet.* none to 4, white, oblong, about 7 mm. long, slightly longer than the inner sepals; *stam.* numerous, 4-5 mm. long; *fil.* white; *hermaphrodite fls.*: *style* about 1 mm. long; *stig.*

shield-shaped; *stam.* or *staminodes* numerous; *drupe* globose, 2-2.5 cm. diam.; *seed* globose, about 13 mm. diam. The wood varies in colour from yellow to pale red, is hard and durable and is used for shipbuilding, constructional work or furniture making.

The name *C. Calaba* was given by Linnaeus Sp. Pl. 514 (1753) to a Ceylon plant and is a different species from the West Indian plant to which Jacquin gave the same name.

Diego Martin, Arima, Cedros, in forests, Trinidad and Tobago.
West Indies and naturalized in Bermuda.

8. RHEEDIA L.

Trees, the sap yellow. *Lvs.* rigidly leathery with pinnate veins. *Fls.* polygamous or dioecious, fascicled or solitary. *Sep.* 2. *Pet.* 4, overlapping in pairs opposite each other. *Male fls.*: *stam.* numerous, free, inserted around the base of a hemispherical fleshy disk; *anths.* small, 2-celled, longitudinally dehiscent. *Hermaphrodite fls.*: *stam.* in a single series around the disk. *Ovary* 3-5 celled, the *style* short or absent; *stigmas* united, peltate, persistent on the fruit; *ovules* solitary in each cell. *Fruit* a berry, indehiscent, 1-celled by disappearance of the partitions. *Seeds* enclosed in an aril-like pulp, ovoid-oblong.

Fruit smooth.

Fls. small; *pet.* of female *fls.* 5-7 mm.

long, stigmatic disk up to 2.5 cm.

wide and flattish. 1. *R. lateriflora*.

Fls. large; *pet.* of female *fls.*

10-15 mm. long, stigmatic disk

fat and cup-like, 3.5-5 mm. wide. 2. *R. macrophylla*.

Fruit warty. 3. *R. acuminata*.

1. *R. lateriflora* L. Hat stand Tree.

R. Sieberi Choisy.

Fawc. and Rendl. Fl. Jam. 5. 196.

Lvs. elliptic-oblong, acute at both ends, up to 22 cm. long and 10 cm. broad, glabrous, the closely set nerves and the reticulation prominent on both sides, *petioles* 1.5-2.5 cm. long; *pedi.* 1-2 cm. long and 1.5-2.5 cm. long on the fruit; *sep.* 2, rarely 3-4, 1.5 mm. long; *pet.* 4, rarely 6, elliptical, 2 broader than the others, white, 5-7 mm. long; *stam.* numerous in the male *fls.*, fewer in the hermaphrodite; *ovary* 3-4-celled, 3 mm. diam.; *stigs.* 3-4, the stigmatic disk 2.5 mm. wide and flattish; *fruit* ellipsoid, 5.5 cm. broad or less, smooth and pointed, *seeds* 1-3, 3 cm. long.

Herb. Trin. 8391, Rogers, Siparia, Southern Watershed Reserve, Trinidad.

Jamaica, Hispaniola, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent.

2. *R. macrophylla* (Mart.) Pl. and Tr.

Garcinia macrophylla Mart.

Tree; *lvs.* elliptical, up to 32 cm. long and 10.5 cm. broad, narrowed at both ends, thinner than those of *R. lateriflora*, and the lateral veins more regularly parallel and straight; *petioles* 1-2 cm. long; *pedi.* stout, 2.5-4 cm. long; *hermaphrodite fls.*: *pet.* 10-15 mm. long; *ovary* 4-6 mm. diam.; *stigmatic disk* fat and cap-like, 3.5-5 mm. wide, 2-3 mm. high; *fruit* ovoid or subglobose, up to 6 cm. long, 4-5 cm. thick, smooth.

Herb. Trin. 3687. Cultivated, possibly native, Trinidad.
Northern South America.

3. *R. acuminata* (Ruiz. and Pav.) Pl. and Tr.

R. Madruno (H.B.K.) Pl. and Tr.

Lvs. oblong-elliptical, acute at the apex, more or less wedge-shaped at the base, 6-16 cm. long, 3.5-6 cm. broad, glabrous, the closely set parallel veins and the reticulation prominent on both sides, *petioles* 8-18 mm. long; *male fls.* in clusters in the leaf axils; *pedi.* about 2 cm. long; *sep.* 2 (or 3), about 1 mm. long; *pet.* 4, rounded, 3.5-4.5 mm. long in the bud, concave; *stam.* about 32, in several series; *hermaphrodite fls.*: *pedi.* 3-4.5 cm. long; *sep.* 3-4 mm. long; *pet.* 4, greenish-yellow, fragrant, broadly obovate or oblong, 8-12 mm. long and nearly as broad, reflexed; *stam.* about 32, 3 mm. long, *disk* about 1 mm. long; *ovary* 3.5 mm. long; *fruit* yellow, ellipsoid, apiculate, up to 6 cm. long and 5 cm. diam., densely covered with irregular, corky warts; *seeds* 1-3, 3 mm. long and 2 cm. broad; *stig.* on fruit broadly 3-lobed to entire. This species dries a greenish-yellow.

Herb. Trin. 7055, de Verteuil, Oropuche: 11251, R.O.W., W.G.F. and E.E.C., Road to Maracas Bay, and Broadway, Quare Reservoir and 11951, Botanic Gardens, Trinidad.

St. Vincent, Northern South America extending to Peru.

DOUBTFUL SPECIES.***R. verticillata* Griseb. Cat. cub. (1886) p. 38.**

R. lanceolata Urb. Symb. Ant. 1. 369.

R. verticillata Urb. l.c. 5. 435.

Branches woody; *lvs.* in whorls of three, lanceolate, the apex acute and provided with a sharp spine, 5-8 cm. long, 1.2-2 cm. broad, rigidly leathery, the nerves very close together and prominent on both sides.

The Trinidad material was collected from a cultivated tree, which no longer exists, in the Botanic Gardens.

It is a native of Haiti and Santo Domingo.

FAMILY 4. MARCGRAVIACEAE.

Climbers, mostly epiphytic. *Lvs.* simple, alternate, sometimes of two forms, without stipules. *Fls.* perfect, hypogynous, in terminal racemes or racemose umbels, the *bracts* of the sterile flowers variously modified into pitcher-like structures. *Sep.* 4-5, overlapping, or joined into a cap-like deciduous mass. *Stam.* 5 or numerous, free or slightly united; *anths.* 2-celled, opening longitudinally. *Ovary* superior, 3 or more celled; *stig.* sessile, radiate; *ovules* numerous, in several rows on thick placentas. *Fruit* more or less spherical, leathery, indehiscent or slightly dehiscent at the base. *Seeds* numerous, small.

- Bracts produced at the apex of the
inflorescence, pitcher-like 1. *Marcgravia*.
Bracts united to the pedicels.
Bracts simple, pitcher-like 2. *Norantea*.
Bracts widely three parted, the central
lobe pitcher-like 3. *Souroubea*.

1. MARCGRAVIA L.

Shrubs, epiphytic or climbing. *Lvs.* of two forms, those of the creeping shoots pressed flat against their support, small and somewhat membranous, those on the flowering shoots leathery, entire, larger. *Fls.* in a contracted, umbel-like, pendulous raceme, the outer flowers perfect, the inner abortive, with pitcher-like bracts. *Sep.* 4, in two pairs. *Cor.* cap-like, falling early. *Stam.* numerous (12-40); *anths.* linear. *Ovary* incompletely 4-12-celled; *stig.* obscurely radiate.

- Lvs.* with glandular pores and reticulate
veins beneath. 1. *M. Hartii*.
Lvs. without glandular pores or
reticulate veins beneath.
Rhachis less than 1 cm. long; fls.
small; pedi. 1.5-2 cm. long;
pitcher bracts 1.5 cm. long 2. *M. elegans*.
Rhachis about 2 cm. long; fls.
larger; pedi. 2.5-3.5 cm. long;
pitcher bracts about 3 cm. long. . . 3. *M. tobagensis*.

1. *M. Hartii* Kr. and Urb.

Urb. Symb. Ant. 1. 366.

Lvs. of the flowering stems oblong or lanceolate, pointed at the apex, obtuse or rounded at the base, 10-13 cm. long, 2.8-4.5 cm. broad, with numerous lateral nerves and conspicuous reticulate

venation beneath, glandular on the margin and with a few pores on either side in the lower half of the leaf beneath; *infl.* 25-30 fld., the *rhachis* 5-8 mm. long; *fls.* obliquely inserted; *pedi.* of the *fertile flowers* 2.5-3.5 cm. long, lenticellate; bracts of the sterile flowers tubular-club-shaped, 2.5-3 cm. long, bearing a small *sterile flower* on the inner side near the top; *sep.* 1 mm. long, 2.5-3 mm. broad; *cor.* narrowly conical, 6-10 mm. long, the larger 5 mm. broad at the base; *stam.* 10-13; *ovary* 6-celled.

Santa Cruz, Arima, Tabaguite and Siparia, Trinidad. Endemic.

2. *M. elegans* Kr. and Urb.

M. umbellata Gr. Fl. 110 in part, not L.

Urb. Symb. Ant. 1. 365.

Lvs. of the creeping stems subsessile, lanceolate-linear, membranous, the lower long acuminate, up to 9 cm. long and 1.5 cm. broad, the upper shorter and obtuse; *lvs.* of the flowering stems lanceolate or oblong-lanceolate, the apex acuminate, the base wedge-shaped, 7-9.5 cm. long, 2-3 cm. broad, leathery, with a row of blackish glands close to the margin beneath, not reticulate veined and with lateral nerves almost or quite invisible; *petioles* 2-4 mm. long; *fls.* in umbels about 25 fld., the *rhachis* less than 1 cm. long; *pedi.* of the *fertile flowers* 1.5-2 cm. long increasing in length in fruit, prominently lenticellate; bracts of the *sterile flowers* tubular, 1.5 cm. long; *sep.* about 1 mm. long, the outer pair about 2.5 mm. broad, the inner 3.5 mm.; *cor.* cap-like, ovate-conical, subacute, apiculate, 6 mm. long, 3 mm. diam.; *stam.* 7-8; *ovary* 4-5 celled; *fruit* globose, 5-7 mm. diam.

Broadway, 5644 and 9789 in Herb. Kew. Heights of Aripo and Tucuche, Trinidad. Endemic.

3. *M. tobagensis* Urb.

M. umbellata Gr. Fl. 110 in part not L.

Fedde. Rep. 14, (1916) 335.

Lvs. of the flowering branches elliptic-oblong or oblong, the apex acutely acuminate, rounded or obtuse at the base, 10-15 cm. long, 3-4.5 cm. broad, leathery with brown glandular prominences beneath near the margin, obsoletely biglandular at the base below, the lateral nerves inconspicuous above and obsolete and invisible or almost invisible beneath, but in some forms more conspicuous beneath, widely separated, impressed and parallel until the connecting marginal nerve is reached, not reticulate veined; *petioles* 2-4 mm. long; *infl.* 20-25 fld. the *rhachis* about 2 cm. long; *fls.* obliquely inserted; *pedi.* of the *fertile flowers* 2.5-3.5 cm. long, somewhat thickened above, at length lenticellate; *sterile fls.*

about 4, the *bracts* about 3 cm. long, with a stalk 5 mm. long, not widened at the mouth, and bearing a small sterile flower near the top; *sep.* unequal, all about 2 mm. long, truncate, from 2.5-5 mm. wide; *cor. cap* ovate-conical, obtuse, 8 mm. long, 5 mm. diam.; *stam.* 13 or 14; *ovary* globose, 7-8-celled; *fruit* spheroidal, 8 mm. long, 10 mm. broad, the *pedi.* 4-5 cm. long.

Craeger: Broadway, 6289, Blanchisseuse Road: Herb. Trin. 9790, Broadway: common on Heights of Aripo: Britt., Hazen and Mendelson 1312, Tucuche, Trinidad. Broadway 4002, in Forest Reserve, Tobago. Endemic.

DOUBTFUL SPECIES.

M. trinitatis Presl. (Sieb. 342) was apparently from Guadeloupe and not from Trinidad. Not seen.

2. NORANTEA Aubl.

Strong growing *climbers*. *Lvs.* leathery, entire. *Racemes* terminal, many fld. *Bracts* hood-like or pitcher-like attached to the middle or top of the pedicel. *Bracteoles* 2, similar to the sepals. *Sep.* 5, overlapping. *Pet.* 5, overlapping, somewhat united at the base or free (or in *M. spiciflora* cap-like). *Stam.* indefinite, adhering to the base of the corolla; *anths.* linear, mucronate. *Ovary* 3-5-celled; *stig.* sessile, 3-5-lobed; *ovules* numerous. *Fruit* globose, leathery.

Fls. shortly stalked (about 3-5 mm.), on elongated racemes 1. *N. guianensis*.

Fls. long stalked (3-5.5 cm.), on rather contracted corymbiform racemes.... 2. *N. spiciflora*.

1. *N. guianensis* Aubl. Beacon.

Aubl. Pl. Guiana t. 220; Gr. Fl. 110.

A strong *climber* reaching to the top of forest trees; *lvs.* obovate, 10-18 cm. long, 5.5-8 cm. broad, thick; *petioles* about 1.5 cm. long; *infl.* an elongated raceme up to 50 cm. or so long, brilliant orange-red, showy from a long distance; *fls.* small; *pedi.* 3-5 mm. long, with a brilliant orange-red pitcher *bract* produced at the top, the *pitcher* 2-2.5 cm. long, its stalk about 1 cm.; *sep.* rounded, about 1.5 mm. long; *pet.* oblong, obtuse, 3-4 mm. long, reflexed; *fruit* about 1 cm. diam., the *style* persistent.

General in Forests. Trinidad.

Trop. S. America.

2. *N. spiciflora* (Juss.) Krug. and Urb.

N. Jussiaei Pl. et Tr.

Marcgravia spiciflora Rich. Gr. Fl. 110.

Climbing shrub; *lvs.* obovate, 8-12 cm. long, 4-6.5 cm. broad, *petioles* broad, about 5 mm. long; *infl.* a rather contracted corymbiform raceme, 8-13 cm. long; *fls.* numerous, *pedi.* 3-5.5 cm. long, somewhat lenticellate; *bracts* hooded, rather less than 5-10 mm. long, subsessile, inserted somewhat below the middle of the pedicel; *sep.* rounded, about 2 mm. long; (*cor.* circumscissile near the middle; *stam.* 18-12 Gr.); *fruit* globose, about 12 mm. diam. crowned by the persistent style.

1235, Britton, Hazen and Mendelson: Herb. Trin. 10050, Freeman and Williams, Forest, Mt. Tucuche. Trinidad.
Dominica, Guadeloupe. St. Vincent.

3. *SOUROUBEA* Aubl.

Strong growing climbers. *Lvs.* leathery, entire. *Racemes* terminal, elongated. *Bracts* attached to the top of the pedicel, 3-lobed. *Bracteoles* 2, sepal-like. *Sep.* 5, overlapping. *Pet.* 5, overlapping, united at the base. *Stam.* 5, joined to the base of the petals and alternating with them; *anths.* ovate or oblong. *Ovary* 5, rarely 4-6-celled; *stig. lobes* radiate; *ovules* numerous. *Fruit* subglobose, thickly leathery, indehiscent or tardily loculicidally dehiscent at the base. *Seeds* numerous.

1. *S. guianensis* Aubl.

Aubl. Pl. Guiana 244. t. 97.

Ruyschia Souroubea Sw. and Gr. Fl.

Lvs. obovate, up to 18 cm. long and 4-8 cm. broad, the apex emarginate and minutely mucronate or sometimes pointed, unequal sided, glabrous, thick, the lateral veins usually invisible above, and conspicuous beneath; *petioles* 5-8 mm. long; *racemes* simple; *fls.* alternate, rather widely separated; *pedi.* 1.5-2.5 cm. long, thick; *bracts* red, 3-lobed, about 1.5 cm. long, the two lateral lobes spreading, lanceolate, obtuse, concave, about 1.5 cm. long, the middle one club-shaped-tubular; *sep.* rounded, concave, 2-3 mm. long; *pet.* oblong, obtuse, reflexed, yellow, 7 mm. long, 4 mm. broad; *fil.* 2 mm. long; *anths.* 1.5 mm. long, opening inwards; *stig.* 5-lobed, sessile.

Herb. Trin. 2994, Crueger, Erin: Guanapo ex Gr., Trinidad.
Continental Trop. America,

FAMILY 5. THEACEAE.

Trees or shrubs. Lvs. alternate, simple, usually leathery, without stipules. *Fls.* solitary or few clustered, axillary, regular, mostly perfect. *Sep.* 5-7, persistent, overlapping. *Pet.* 5, free or united below. *Stam.* usually numerous, free or variously united at the base; *anths.* 2-celled. *Ovary* superior, 2-several celled; *ovules* 1-20 in each cell; *styles* distinct, united or absent. *Fruit* a capsule or indehiscent. *Seeds* without arils.

Style conspicuous; stig. subcapitate,

minute 1. *Ternstroemia*.

Style wanting or very short; stigs.

usually 3 2. *Freziera*.

1. TERNSTROEMIA L.

Trees or shrubs. Lvs. entire or notched, mostly glabrous. *Pedu.* 1-flowered, axillary, solitary or few clustered, with 2 bracteoles to each flower. *Sep.* 5, overlapping. *Pet.* 5, overlapping, united at the base or to about the middle. *Stam.* numerous, united to the base of the corolla. *Ovary* mostly 2 or 3-celled; *ovules* pendulous; *style* simple. *Fruit* indehiscent, leathery, few seeded, the *style* persistent.

Ovary 2-celled, ovules 12-20 in each cell ... 1. *T. peduncularis*.

Ovary 2-celled, ovules 2 in each cell. 2. *T. oligostemon*.

Ovary 3-celled, ovules 1 in each cell 3. *T. delicatula*.

1. *T. peduncularis* DC.

Taonabo peduncularis (DC.) Britt.

Krug. and Urb. in Engl. Bot. Jahrb. 21. 526-7.

Britt. and Wils. Sc. Surv. Porto Rico 5. 580.

Tree up to 10 m. high, usually smaller, sometimes shrubby; *lvs.* obovate to oblong-obovate, somewhat leathery, 4-7 cm. long, rounded at the apex and narrowed at the base, entire; *pedu.* slender, 2-7 cm. long; *sep.* 5, the outer ovate, glandular, 7-8 mm. long, the inner suborbicular, without glands, about 9 mm. broad; *pet.* 8-10 mm. long, the apex obtuse; *fruit* subglobose, pointed, about 12 mm. diam.

Not seen. Sieber 337, ex. Choisy. Doubtfully native of Trinidad. St. Martin to Guadeloupe.

2. *T. oligostemon* Krug. and Urb. in Engl. Bot. Jahrb. 21. 534.

Small tree; *lvs.* obovate or obovate-elliptical, 6-13 cm. long, 2.5-5.5 cm. broad, shortly and obtusely acuminate or cuspidate at the apex, long-attenuate to the base, entire, glabrous, nerves fairly conspicuous especially on the lower surface; *petioles* 5-15 mm. long; *fls.* white; *pedi.* 1-2.5 cm. long; *sep.* suborbicular, 5-6 mm. long, about 5 mm. wide; *pet.* up to 7 mm. long, cohering at the base to two-fifths of their length; *stam.* about 20 in a single series; *fil.* 1-2 mm. long; *anths.* yellow, 4-4.5 mm. long; *ov.* up to 2 mm. diam., 2-celled with 2 *ovules* in each cell; *style* about 4 mm. long; *stig.* entire.

The material is very incomplete, but shows the essential floral characters of this species, and the leaves agree fairly well with those of the types in the Berlin Herbarium.

Herb. Trin. 11791, Salem-Charleston Trace, Sept., 1927, R. O. Williams: The Widow and Easterfield ex Broadway, Tobago.

Guadeloupe and Martinique.

3. *T. delicatula* Choisy.

Krug. and Urb. in Engl. Bot. Jahrb. 21. 536-7.

Tree 5 m.; *lvs.* obovate, obovate-elliptic or elliptic-oblong, gradually narrowed to the base and attenuate into the *petiole* which is 6-15 mm. long, obtuse or very shortly acuminate at the apex, 4-9 cm. long, 1.5-4 cm. broad, papery with age, more or less distinctly crenulate in the upper half, the lateral nerves slightly prominulous on both sides; *fls.* fairly numerous and crowded on the branchlets, nodding; *pedu.* 1-2 cm. long; *sep.* 5, subequal, 5-6 mm. long, 4-5 mm. broad, the outer ovate, entire, the inner suborbicular and erose-denticulate on the margin; *pet.* united for $\frac{1}{2}$ of their length, 5-6 mm. long, the outer 3-4 mm. broad, ovate or subquadrangular, subtruncate or very slightly emarginate at the apex; *fil.* in two series, 40-45, 2-6 times shorter than the anthers which are 2.5-3 mm. long; *style* 3-4 mm. long, 2-2 $\frac{1}{2}$ times longer than the ovary; *stig.* subcapitate, tricrenate on the margin; *ovary* 3-celled, ovate-globose or ovate-conic, with one ovule in each cell.

Not seen. (Eggers, 1381 in Herb. Kew and Eggers 1071.) Arima, Trinidad.

Guiana.

2. FREZIERA Sw.

Shrubs or small *trees*. *Lvs.* usually notched. *Fls.* small, polygamous or dioecious, 1 or several clustered in the axils of the leaves. *Sep.* 5. *Pet.* 5, free or barely united at the base. *Stam.* numerous (15-30), united at the base to the corolla; *anths.* glabrous. *Ovary* 3-5-celled; *style* entire; *stig.* 3-5, oval to oblong, short; *ovules* numerous, attached to a placenta intruded into the middle of each cell. *Fruit* indehiscent. *Seeds* 10-50, kidney-shaped, 0.5-1 mm. long.

1. F. undulata Sw.

Fawc. and Rendl. Fl. Jam. 5. 187.

Tree about 17 m. the young branches more or less hairy, soon glabrescent; *lvs.* 5-15 cm. long, 2-4 cm. broad, usually lanceolate-acuminate, conspicuously crenate-dentate, glabrous or nearly so; *petioles* 5-15 mm. long; *fls. stalks* shorter than the petioles; *sep.* roundish, 1.5-2.5 mm. long; *pet.* white, 5-6 mm. long; *fil.* generally 20; *anths.* glabrous, lanceolate, longer than the filaments; *ovary* 3-celled; *ovules* 15-20 in each cell; *fruit* 4-5 mm. long.

Not seen. (Sieber 113, ex Urb., Trinidad.) Not otherwise known from Trinidad.

St. Kitts to Trinidad.

COHORT 6. **MALVALES.**

BY

* R. O. WILLIAMS AND E. E. CHEESMAN.

Anths. 1-celled.	
Pollen spiny.	1. Malvaceae.
Pollen smooth	2. Bombacaceae.
Anths. 2-celled.	
Stam. more or less united	3. Sterculiaceae.
Stam. free.	4. Tiliaceae.

FAMILY 1. **MALVACEAE.**

Herbs, shrubs, or trees, wood soft and light, hairs when present often stellate (star-shaped). *Lvs.* alternate, often palmately veined, entire or variously lobed, not compound. *Stip.* present, but usually small, often deciduous. *Fls.* regular, perfect, solitary or clustered, often showy. *Bracteoles* often present, forming an epicalyx outside the true calyx. *Sep.* usually 5, more or less united. *Pet.* 5, twisted in the bud, often asymmetrical. *Stam.* numerous, the *filaments* united below into a tube, which is often joined to the petals and makes the corolla appear gamopetalous; *anthers* monothecous (*i.e.*, 1-celled, each equalling half a normal anther), often kidney-shaped, opening above; *pollen* spiny. *Ovary* superior, several-celled. *Fruit* dry, the carpels sometimes falling away when ripe, sometimes joined into a capsule. *Seeds* 1 to many in each carpel. *Cotyledons* folded in the seed.

A fibrous bast and presence of mucilage are anatomical features of many members of the family. On account of the former, several species are useful as fibre plants, notably *Hibiscus Sabdariffa* L., *H. cannabinus* L., *Pariti tiliaceum* (L.) Juss., and *Abutilon* spp. The hairs on the seeds of species of *Gossypium* are cotton, the most important of all economic fibres. The unripe fruits of *Abelmoschus esculentus* (L.) C. and C. are eaten as a vegetable, the well-known okra, or ochro. Many species are cultivated as ornamental plants, especially *Hibiscus rosa-sinensis* L. which has a large number of handsome varieties.

* The writers are deeply indebted to Mr. N. Y. Sandwith of the Royal Botanic Gardens, Kew, for critically reading the manuscript.

- Fruit of separate carpels.
 Carp. several-seeded, not falling, or falling tardily.
 Carp. not inflated.
 Carp. not constricted below the middle.1. *Abutilon*.
 Carp. constricted below the middle.2. *Wissadula*.
 Carp. inflated when ripe.3. *Gayoides*.
 Carp. 1-seeded, falling when ripe.
 Stig. as many as the carpels.
 Epicalyx present.4. *Malvastrum*.
 Epicalyx absent.
 Lvs. spearhead-shaped.5. *Anoda*.
 Lvs. various, not spearhead-shaped.6. *Sida*.
 Stig. 10, carpels 5.
 Plant hispid; carpels glabrous or downy.8. *Malachra*.
 Plant not hispid.
 Carp. covered with anchor-like spines.9. *Urena*.
 Carp. with 3 long awns.
 Fls. solitary.10. *Pavonia*.
 Fls. in heads.11. *Typhalaea*.
 Carp. with 2 short beaks.12. *Malache*.
 Carp. smooth, without awns or beaks.13. *Lebretonia*.
 Fruit a capsule.
 Epicalyx absent.7. *Bastardia*.
 Epicalyx present.
 Style with 5 spreading branches.
 Cal. persistent on the fruit.
 Tree; bracteoles joined.14. *Pariti*.
 Shrubs or herbs; bracteoles distinct.15. *Hibiscus*.
 Cal. deciduous from the fruit.16. *Abelmoschus*.
 Style simple, or divided into short erect branches.
 Fruit indehiscent.17. *Thespesia*.
 Fruit dehiscent.
 Subshrub; lvs. entire.18. *Cienfugosia*.
 Shrub; lvs. lobed.19. *Gossypium*.

1. ABUTILON (Tourn.) Mill.

Herbs or shrubs rarely trees, hairy covering often soft. Lvs. heart-shaped, angled or lobed, rarely narrow. Fls. often yellow,

mostly axillary. *Epicalyx* 0. *Cal.* 5-fid. *Carpels* 5 to numerous; *style* branches as many. *Ripe carpels* cohering at the base or free, roundish, angled, or with divergent beaks above, bivalved, naked within, 3-9-seeded.

Carp. 5.1. *A. umbellatum*.

Carp. 10-30.

Stem somewhat viscid with long

spreading hairs.2. *A. hirtum*.

Stem densely pubescent, not sticky.3. *A. giganteum*.

1. *A. umbellatum* (L.) Sweet.

Gr. Fl. 78: Urb. Symb. Ant. 4. 384: Baker, J. Bot. 31. 72.

Subshrub or *shrub*; *stems* erect, branched, pubescent with stellate down; *petioles* 1-4 cm., *lvs.* broadly heart-shaped, acuminate, 3-6 cm. long, coarsely toothed, downy on both surfaces; *fls.* clustered on short branches in the axils of the upper leaves; *pedi.* jointed near the top; *cal.* hairy, increasing to 7-8 mm. long on the fruit, 5-fid, lobes triangular; *pet.* yellow, twice the length of the calyx; *carp.* 5-10, hairy, equalling or slightly exceeding the calyx without their two sharp divergent beaks which are 1.5-2 mm. long, 3-seeded; *seeds* angular, covered with small warts.

Bocas Islands, Trinidad.

West Indies, Central America, Colombia, Venezuela and Peru.

2. *A. hirtum* (Lam.) Sweet.

A. graveolens Wight and Arn. var. *hirtum* Mart.: *A. indicum* var. *hirtum* Gr.

Britt. and Wils. Sc. Surv. Porto Rico 5. 547: Gr. Fl. p. 78.

Shrub, 6-12 dm. high, somewhat viscid and clothed with both short pubescence and long pilose hairs; *lvs.* suborbicular, 3-10 cm. broad, the apex acute, the base deeply cordate, irregularly dentate, puberulent on both sides, *petioles* 10.5 cm. long or less; *fls.* rich yellow, red at the base, axillary, usually solitary, 3.5-4 cm. diam.; *pedu.* shorter than the *petioles* of the older leaves; *cal.* densely pubescent, the lobes 12-15 mm. long, acute or acuminate; *pet.* 1.5-2 cm. long; *carp.* about 20-30, flat, about 1 cm. broad, somewhat broader than long, slightly pointed, thin, dark brown or black, in the young state densely pubescent with stellate hairs, at maturity pubescent on the back, otherwise somewhat glabrous.

Shack in Herb. Kew, Trinidad. Broadway, 2445: Williams, 11829, Fort Hill, Tobago.

Florida, West Indies, Old World Tropics.

3. *A. giganteum* (Jacq.) Sweet.*A. confertiflorum* Rich.

Baker, J. Bot. 31. 74.

Tree, 7 m.; young branches and petioles covered with spreading hairs; *lvs.* roundish, with a strong tendency to develop two angular lateral lobes, heart-shaped at the base, acuminate at the apex, up to 20 cm. long, minutely toothed by projection of the veins, downy on both surfaces, almost woolly; *fls.* in spreading, leafy, terminal panicles; *pedu.* downy; *cal.* downy, 1-1.2 cm. long, 5-fid to below the middle, lobes lanceolate; *pet.* about as long as the calyx, hairy within at the base; *carp.* about 12, hairy, truncate, very shortly pointed, 8-10 mm. long, 1-3 seeded; *seeds* hairy.

Bocas Islands, Trinidad.

Jamaica, Cuba, Central America, Colombia and Peru.

2. *WISSADULA* Presl.

Subshrubs or *shrubs*, often pubescent and greyish. *Lvs.* heart-shaped. *Fls.* small, clustered on axillary peduncles, the upper ones forming a terminal panicle. *Epicalyx* 0. *Cal.* 5-fid. *Stig.* 5. *Carp.* acute or beaked at the apex, more or less septate within by a transverse plate or ridge formed by infolding of the wall (except in *W. contracta*), membranous when ripe, dehiscent in two valves. *Seeds* usually 3 in each carpel, 1 in the lower part, 2 above.

Ovary cells with 3 ovules. *Carp.* usually 3-seeded.

Carpels markedly constricted below the middle.1. *W. periplocifolia*.

Carpels scarcely constricted below the middle2. *W. contracta*.

Ovary cells with 1 ovule. *Carp.* 1-seeded. 3. *W. Fadyenii*.

1. *W. periplocifolia* (L.) Presl. Maholtine.*Abutilon periplocifolium* G. Don.

Gr. Fl. 77: Urb. Symb. Ant. 4. 386.

Subshrub, 2-3 m.; *stems* pubescent with stellate down; *lvs.* broadly or narrowly heart-shaped, acute or acuminate, *petioles* variable, *blades* 4-16 cm. long, 2-8 cm. wide, entire, with scattered hairs above and a dense velvety down beneath; *panicles* loose and spreading; *pedi.* jointed above the middle; *cal.* downy, 2-4 mm. long, 5-fid to below the middle, lobes triangular to ovate; *carp.* 5(-6), 0.5-1 cm. long, constricted below the middle, dehiscent to the middle, *valves* sharply pointed; *seeds* 3, 2 above the constriction, 1 below pubescent with tufted hairs.

This plant was investigated by Hart as a possible source of commercial fibre, and the report upon samples sent to London was favourable. See Kew Bull. 1899, p. 226.

Gasparillo and Guanapo, Trinidad.

Cuba, Porto Rico, Jamaica, St. Cruz, Cannouan, S. America, S. E. Asia.

2. **W. contracta** (Link) Fries.

Sida contracta Link. *Abutilon lucianum* Sweet.

Urb. Symb. Ant. 5. 415.

Subshrub, 1-3 m., erect, sparingly branched; *stems* and *leaves* velvety, and with scattered stellate hairs; *lvs.* broadly heart-shaped, acuminate, 5-16 cm. long, 3-14 cm. wide, whitish beneath, velvety on both surfaces; *fls.* white, about 1 cm. diam., in dense terminal panicles; *cal.* 5-fid to the middle, lobes triangular; *carp.* 5(-6), 8 mm. long, 3-seeded, scarcely constricted.

The infolding of the wall dividing the carpel more or less completely into two chambers, which is the chief character separating *Wissadula* from *Abutilon*, is in this species represented only by a scarcely perceptible constriction, on which account Urban uses the name *Abutilon lucianum* for Trin. Herb. 499, whilst admitting a close resemblance between this species and *W. hernandioides* Garcke. We have followed Britton's determination of Trin. Herb. 8881, and adopted his synonymy.

Northern Range and Chacachacare, Trinidad. Tobago.

Porto Rico, St. Lucia, Grenada, Guatemala, Venezuela, Guiana, Brazil.

3. **W. Fadyenii** Planch. ex R.E. Fries.

Fawc. and Rendl. Fl. Jam. 5. 96.

Sida divergens Gr. Fl. 77. non Benth.

Undershrub, 3-12 dm. long, younger parts with yellow-brownish stellate hairs; *lvs.* ovate-triangular, narrowing gradually into a long tip, the base truncate or cordate, 5-10 cm. long, margin entire, upper surface covered with very minute white stellate hairs, sometimes subglabrous, beneath densely tomentose and soft to the touch, with larger stellate hairs interspersed, 5-7 nerved, nerves and veins prominent beneath; *petioles* from very short to 4 cm. long; *stip.* 4-5 mm. long, thread-like; *fls.* in the axils of the upper leaves and on a large terminal panicle; *pedu.* 1.5-3 cm. long, in axillary flowers to 5 cm. long; *cal.* 3-3.5 mm. long, divided about halfway into triangular lobes, purplish; *pet.* tawny-yellow or orange, 4-5 mm. long; *caps.* about 6 mm. in diam., *carpels*

minutely puberulous, 4 mm. long, point about .5 mm. long; seed one only about 2 mm. long, hirtellous, densely so towards the hilum. (desc. ex Fawc. and Rendl. l.c.).

Not seen, Crueger in Herb. Kew, Trinidad.
Colombia.

3. GAYOIDES Small.

Perennial herb or subshrub, habit of *Abutilon*. Fls. axillary, solitary. *Epicalyx* 0. *Cal.* deeply 5-fid. *Pet.* 5. *Carp.* numerous, 1-celled, 2-6 seeded, membranous and inflated when ripe, the apex rounded, not beaked. *Seeds* glabrous.

1. *G. crispum* (L.) Small.

Sida crispum L.: *Abutilon crispum* G. Don.

Gr. Fl. 79: Urb. Symb. Ant. 4. 385: Baker J. Bot. 31. 213:
Britt. and Mills. Bah. Fl. 266.

Slender, pubescent, 30-100 cm.; stems usually much branched; *petioles* variable, the upper leaves almost sessile; *lvs.* broadly heart-shaped, acuminate, 2.5-5 cm. long, and about as wide, coarsely toothed; *pedi.* slender, jointed near the top; *cal.* 6 mm. long, lobes ovate, pointed; *pet.* pale yellow or whitish, longer than the calyx; *carp.* about 12, 9-13 mm. long.

Trin. Herb. 1098. Locality unknown. Trinidad.
West Indies, Tropical America, S.E. Asia.

4. MALVASTRUM A. Gray.

Herbs, erect or creeping, or subshrubs. *Lvs.* various. *Fls.* orange or yellow, shortly stalked or nearly sessile, axillary or in terminal spikes. *Epicalyx* small, of 3 bracteoles. *Cal.* 5-lobed. *Stig.* as many as the carpels. *Carp.* 5 to numerous, 1-seeded, falling when ripe from a short axis, indehiscent or slightly bivalved.

Fls. in spikes; carpels not awned. . . . 1. *M. spicatum*.

Fls. not in spikes; carpels with

3 awns. 2. *M. coromandelianum*.

1. *M. spicatum* (L.) A. Gray.

Gr. Fl. 72: Urb. Symb. Ant. 4. 388: Baker, J. Bot. 29. 170.

Perennial, usually 50-100 cm., sometimes shrubby and exceeding 2 m.; stems erect, branched, cylindrical, covered with a dense, whitish, stellate down; *petioles* 0.5-6 cm., *lvs.* triangular to ovoid, pointed, the lower ones about 7 cm. long, coarsely toothed, covered with stellate down on both surfaces, especially the lower;

stip. 3 mm., linear, deciduous; *fls.* in dense terminal and axillary spikes, 2-7 cm. long, the axillary ones often reduced to 2 or 3 flowers; *bracteoles* lanceolate, about as long as the calyx; *cal.* lobes ovate-lanceolate, as long as the tube or slightly longer, bearded with long stiff hairs; *pet.* reversed heart-shaped, slightly exceeding the calyx; *carp.* about 15, awnless, glabrous on the flat back, hairy above.

Northern Range and Bocas Islands, Trinidad. Tobago.
Cosmopolitan Tropical.

2. **M. coromandelianum** (L.) Garcke.

M. tricuspidatum A. Gray.

Gr. Fl. 72: Urb. Symb. Ant. 4.387: Baker J. Bot. 29. 170.

Britt. Fl. Ber. 235: Britt. and Mills. Fl. Bah. 267.

Perennial, 30-80 cm.; *stem* erect, branched, cylindrical, covered like the petioles and inflorescences with long adpressed silky hairs; *petioles* 0.5-2 cm. long, *lvs.* variable, ovate-lanceolate or oblong-lanceolate, blunt, 2-5 cm. long, coarsely toothed, glabrous except for a few scattered hairs above and silky adpressed hairs along the veins beneath; *stip.* 5-7 mm., linear, deciduous; *fls.* axillary and terminal, solitary or in clusters of 2-5, shortly stalked *bracteoles* linear, shorter than the calyx; *cal.* nearly 1 cm. long, hairy, 5-fid to below the middle, lobes ovate with a long point; *pet.* reversed heart-shaped, slightly longer than the calyx; *carp.* 10 or more, with one long awn at the top and two shorter ones at the middle of the back, the back hispid above the middle, the inner edge deeply notched.

Southern and Central districts, and Gasparee, Trinidad. Tobago.
Cosmopolitan Tropical.

5. **ANODA** Cav.

Herbs. *Lvs.* usually spear head-shaped. *Fls.* stalked, axillary. *Epicalyx* o. *Cal.* 5-fid. *Stig.* as many as the carpels. *Carp.* numerous, 1-seeded, falling from the axis, the side walls disappearing as the fruit ripens.

1. **A. acerifolia** (Zucc.) DC.

Hochr. in Anns. Cons. Geneve 20.50 (1916): Britt. and Wils. Sc. Surv. Porto Rico 5.556.

Annual, 60-100 cm.; *stem* slender, sparsely hairy; *petioles* 1-2 cm. long, with a fringe of hairs along one side, *lvs.* spearhead-shaped or lobed at the base, acute at the apex, 2.5-6 cm. long, glabrous or somewhat hairy; *stip.* linear, deciduous; *fls.* solitary;

pedi. as long as, or longer than, the leaf; *cal.* increasing to 1.5 cm. on the fruit, 5-fid to below the middle, lobes ovate, pointed; *pet.* blue, much longer than the calyx; *carp.* 10-20, hispid, beaked on the back.

This species has formerly been confused with *A. hastata* Cav.

Tobago.

Jamaica, Cuba, Hispaniola, Porto Rico, Mexico to Peru.

6. SIDA L.

Herbs or *shrubs*. *Fls.* often yellow, axillary or in racemes, spikes or heads. *Epicalyx* 0. *Cal.* 5-toothed, or 5-fid. *Stig.* as many as the carpels. *Carp.* 5 to numerous, 1-seeded, falling from a central axis when ripe.

Lvs. linear, much elongated.....1. *S. linifolia*.

Lvs. various, not linear.

Lvs. tapering or rounded at the base.

Carpels 52. *S. glomerata*.

Carpels more than 5.

Carpels awned.

Pedi. less than 1 cm. long.....3. *S. acuta*.

Pedi. 1 cm. long or more.

Pedi. not jointed; awns long. .4. *S. Kohautiana*.

Pedi. jointed above the middle 5. *S. rhombifolia*.

Carpels awnless.....6. *S. acuminata*.

Lvs. heart-shaped at the base.

Carpels 5.

Fls. shortly stalked; carpels

awnless.....7. *S. urens*.

Fls. long-stalked; carpels with

2 teeth.....8. *S. glutinosa*.

Carpels more than 5.

Carpels with long awns.....9. *S. cordifolia*.

Carpels awnless.....6. *S. acuminata*.

1. *S. linifolia* Juss.

Gr. Fl. 76: Baker J. Bot. 30.140.

Subshrub, 40-80 cm.; *stems* slender, erect, usually branched above, hairy; *lvs.* linear, 5-15 cm. long, 2-7 mm. wide, entire, hairy on both sides; *stip.* linear, equalling the petiole, 5-7 mm.; *fls.* in terminal corymbs; *cal.* hairy, 5-fid to the middle, lobes triangular; *pet.* exceeding the calyx; *carp.* 5-8, glabrous, awnless, indehiscent.

Diego Martin, Cedros and Icos, Trinidad. Bacolet, Tobago.

West Indies, Tropical America, Nigeria, Fiji.

2. **S. glomerata** Cav.

Gr. Fl. 73: Urb. Symb. Ant. 4. 389: Baker, J. Bot. 30. 237.

Subshrub, 30-90 cm.; *stems* usually branched, pubescent mostly with simple hairs, cylindrical; *petioles* 3-4 mm., *lvs.* lanceolate, 1.5-5 cm. long, toothed, usually clothed on both sides with long, soft, spreading hairs; *stip.* large, obliquely lanceolate, 0.6-1.3 cm. long; *fls.* axillary, subsessile, solitary or clustered; *cal.* about 5 mm. long, 5-fid to the middle, hairy, its lobes pointed; *pet.* pale yellow or almost white, barely exceeding the calyx; *carp.* 5, netted, glabrous, bivalved, the valves awl-shaped, at length divergent.

General, Trinidad.

West Indies and Tropical America.

3. **S. acuta** Burm. Ballier Savanne.

S. carpinifolia L.

Gr. Fl. 73: Britt. Fl. Ber. 236: Fawc. and Rendl.

Fl. Jam. 5.119.

Subshrub, 30-180 cm.; *stem* erect, branched; *lvs.* very variable, 2-10 cm. long, ovate to oblong-lanceolate, toothed above the base, paler and usually covered with stellate down beneath; *stip.* linear; *fls.* axillary, shortly stalked or nearly sessile; *cal.* 5-fid, nearly glabrous, segments broadly triangular, acute; *pet.* yellow, exceeding the calyx, unequally bilobed; *carp.* 7-12, netted, with two awns or beaks.

An extremely variable species. Individuals may be very downy or nearly glabrous, with pedicels shorter than the petioles or twice their length, carpels glabrous or downy, their awns very short or long. The leaves vary with the age of the plant as well as with situation, being narrower on older plants.

General and common. Trinidad and Tobago.

S. United States, Bermuda, Bahamas, West Indies, Trop. and Subtropical Regions.

4. **S. Kohautiana** Presl.

S. surinamensis Miq.

Subshrub, exceeding 50 cm., minutely downy or almost glabrous; *lvs.* lanceolate, acute, the largest at least 12 cm. long, toothed, paler beneath; *fls.* axillary, clustered, with accessory branches; *pedi.* 1-1.5 cm. long; *cal.* 5-6 mm. long, 5-fid to the middle, lobes

triangular, pointed; *carp.* 10-12, netted, pubescent, with 2 long slender awns exceeding the calyx almost by its own length, at dehiscence widely divergent; *seed* hairy at the apex.

Maracas and Chaguanas, Trinidad.

Guiana and Brazil.

5. *S. rhombifolia* L.

Gr. Fl. 74: Urb. Symb. Ant. 4. 390: Britt. Fl. Ber. 236.

Subshrub, 30 cm. to 2 m.; *stems* erect, usually much branched; *lvs.* rhomboid-lanceolate to narrowly elliptical, obtuse at the base, apex acute or obtuse, 1-7 cm. long, toothed above the base, glabrous or nearly so above, paler and minutely downy with stellate hairs beneath, *petioles* 3-8 mm.; *stip.* linear, slightly longer than the petiole; *fls.* axillary, usually solitary, but with accessory branches, making them appear clustered; *pedi.* 1-4 cm. long, jointed above the middle; *cal.* 5-fid, lobes triangular, pointed; *pet.* exceeding the calyx, unequally bilobed; *carp.* 7-12, with 1 or 2 awns of variable length.

A very variable species, some of its forms approaching *S. acuta*, but distinguished by the longer, jointed pedicels.

General and common, Trinidad and Tobago.

Cosmopolitan Tropical and Subtropical.

6. *S. acuminata* DC.

Urb. Symb. Ant. 4. 392: Baker J. Bot. 30. 395.

Subshrub, 50 cm. to 1 m.; *stem* erect, branched, the young parts thickly covered with rust-coloured stellate down; *petioles* 0.3-1 cm., *lvs.* elliptical or lanceolate, 3-6 cm. long, apex acute or bluntish, base more or less rounded, sometimes heart-shaped, coarsely toothed, covered on both sides, especially thickly beneath, with rusty stellate hairs; *stip.* linear, hairy, deciduous, about 1 cm. long; *fls.* axillary, solitary, or clustered; *pedi.* variable, usually short; *cal.* 4-5 mm. long, 5-fid to below the middle, very hairy; *carp.* 7-12, rounded and stellate-hairy on the back, netted on the inner faces, awnless.

Herb. Trin. 3014, Chacachacare, 1864.

West Indies and S. America.

7. *S. urens* L.

Gr. Fl. 75: Urb. Symb. Ant. 4. 392: Baker J. Bot. 30. 294.

Perennial, 30-150 cm., *stems*, *leaves* and *calyces* covered with long stiff hairs; *stems* erect at first, at length trailing, branches slender, cylindrical; *petioles* half the length of the leaf, *lvs.* heart-shaped, pointed, coarsely toothed, 4-8 cm. long; *stip.* minute; *fls.* axillary and terminal, shortly stalked, clustered; *cal.* 5-fid to the

middle, about 7 mm. long, lobes awl-shaped; *pet.* yellow, sometimes blotched with red at the base, about the length of the calyx; *carp.* 5, glabrous, slightly wrinkled, awnless.

General, Trinidad.

West Indies, Cent. and S. America, Tropical Africa.

8. *S. glutinosa* Commers.

S. nervosa D C.

Urb. Symb. Ant. 4. 392.

Subshrub, glandular, and velvety with stellate down; *stems* erect, branched, bearing long simple hairs as well as the down; *lvs.* heart-shaped, pointed, toothed, *petioles* nearly as long as the blade; *fls.* several in each axil, with a long accessory branch, upper leaves reduced, so that the top of the stem forms a panicle; *pedi.* elongated, jointed above the middle; *cal.* about 4 mm. long, pubescent, broadly 5-toothed, the teeth triangular, half the length of the tube; *pet.* exceeding the calyx; *carp.* 5, pubescent, with 2 short awns.

Trinidad ex Urban. No local specimen seen.

West Indies, Cent. and S. America, Madagascar, S.E. Asia.

9. *S. cordifolia* L.

Gr. Fl. 76: Urb. Symb. Ant. 4. 391: Baker J. Bot. 30. 291

Subshrub, up to 2 m., velvety in all its parts; *stems* erect, usually much branched; *petioles* 1-3 cm., *lvs.* ovate, more or less heart-shaped at the base, blunt or acute, 3-7 cm. long, coarsely toothed; *stip.* 8 mm., linear, deciduous; *fls.* mostly in dense terminal and axillary racemes, a few solitary or clustered in the axils immediately below; *cal.* about 6 mm. long, 5-fid nearly to the middle, lobes triangular; *carp.* 10-12, netted, bearing 2 long straight awns set with reflexed hairs and exceeding the calyx.

Cedros and Chacachacare, Trinidad. Bethesda, Williams, Tobago. Cosmopolitan Tropical.

DOUBTFUL SPECIES.

Trin. Herb. 1555 represents another species of *Sida*, not sufficiently complete for determination.

7. *BASTARDIA* H. B. K.

Woolly herbs or shrubs, habit of *Sida*. *Lvs.* heart-shaped. *Fls.* yellow, axillary, solitary. *Epicalyx* 0. *Cal.* 5-fid. *Stig.* 5. *Fruit* a capsule, depressed globose, awnless, 5-ribbed, 5-celled, cells 1-seeded, loculicidally 5-valved, each valve bearing a septum on its inner face.

1. **B. viscosa** (L.) H.B.K.

Sida viscosa L.

Gr. Fl. 80 : Urb. Symb. Ant. 4. 393 : Baker, J. Bot. 31. 68.

Subshrub, 50-100 cm., velvety-pubescent in all its parts; *stems* slender, cylindrical, usually much branched; *lvs.* petioled, pointed, variable in size, commonly 1-5 cm. long, irregularly toothed; *stip.* minute, deciduous; *cal.* 4-5 mm. long, 5-fid nearly to the base, lobes ovate, pointed; *caps.* when ripe exceeding the calyx, dehiscent to the base; *seeds* pubescent.

Bocas Islands, Trinidad.

West Indies and Tropical S. America.

8. **MALACHRA** L.

Hispid *herbs* or *subshrubs*. *Lvs.* angled or lobed. *Fls.* in dense terminal and axillary heads, with involucre of leafy bracts. *Bracteoles* of the epicalyx irregularly mixed among the flowers of a head, or wanting. *Cal.* 5-fid. *Style* 10-branched. *Carp.* 5, 1-seeded, falling from the axils, indehiscent or opening slightly at the inner edge.

Fls. yellow; carpels pubescent.....1. *M. alceifolia*.

Fls. white; carpels glabrous, netted... 2. *M. fasciata*.

1. **M. alceifolia** Jacq.

M. alceifolia rotundifolia Gürke. *M. palmata* of Gr.

Gr. Fl. 81 : Urb. Symb. Ant. 4. 394.

Stems coarse, 0.5-2 m., with scattered stiff hairs, or sometimes downy; *lvs.* variable, roundish, lower usually 5-lobed, upper 3-lobed, coarsely toothed, somewhat hairy or almost glabrous, blades 4-12 cm. long; *fl.* heads stalked, commonly 2 or more in each axil; *bracts* hispid, broad, heart-shaped at the base, entire or 3-lobed, about 1.5 cm. long; *cal.* 5-fid nearly to the base, 7-8 mm. long, lobes awl-shaped, hairy; *pet.* yellow, twice the length of the calyx; *carp.* 3 mm. long, more or less downy, net-veined beneath the down, rounded on the back.

Waste and cultivated grounds. Trinidad and Tobago.

West Indies, Panama to Guiana.

2. **M. fasciata** Jacq.

M. radiata of Gr. (not L.).

Gr. Fl. 81 : Urb. Symb. Ant. 4. 395.

Stem 0.5-2 m. thickly covered with long, stiff, whitish hairs; *lvs.* usually hairy, mostly 3-fid to or beyond the middle, sometimes 5-fid, lobes oblong, coarsely toothed, upper leaves with the lobes reduced or absent; *fls. heads* shortly stalked; *bracts* narrowed

at the base into a stalk from which arise 1 or 2 pairs of long, linear, stipule-like lobes; *cal.* about 4 mm. long, 5-fid nearly to the base, lobes lanceolate; *pet.* white, about 1 cm. long; *carp.* 3 mm. long, glabrous, netted with prominent ridges, very convex on the back.

Waste and cultivated grounds. Trinidad and Tobago.
West Indies and Trop. Cont. America.

9. URENA L.

Annual or perennial herbs or shrubs. Lvs. usually lobed. *Fls.* small, axillary, sessile or shortly stalked, usually clustered. *Epicalyx* of 5 bracteoles, united to the calyx. *Cal.* 5-fid or 5-toothed. *Stig.* 10. *Carp.* 5, 1-seeded, falling when ripe, indehiscent, covered with hooked anchor-like spines.

Lvs. shallowly lobed. 1. *U. lobata*.
Lvs. lobed beyond the middle. 2. *U. sinuata*.

1. *U. lobata* L.

Gr. Fl. 81: Urb. Symb. Ant. 4. 395.

Shrubby, up to 2 m., more or less velvety with stellate down, especially the young parts; *lvs.* roundish, bluntly pointed, irregularly lobed, the lower ones usually with 3, less commonly 5, pointed main lobes, upper ones often ovate and almost entire, *petioled*, blades 3-10 cm. long, greyish beneath, with 1-3 slit-like glands on the base of the main veins; *fls.* axillary and terminal, solitary or in clusters of several; *epicalyx* 6 mm. long, 5-fid nearly to the base, its narrow hairy lobes longer than the calyx; *pet.* pink, about 1.7 cm. long; *carp.* convex, 5 mm. long, bearing a thick, stellate down as well as the spines characteristic of the genus.

Waste and cultivated grounds. Trinidad.
Cosmopolitan Tropical.

2. *U. sinuata* L. Cousin Mahoe.

U. lobata sinuata Miq.

Gr. Fl. 81: Urb. Symb. Ant. 4. 396.

Shrubby, more slender and less downy than the preceding species; *lvs.* deeply cut into 3-5 main lobes, which are themselves irregularly lobed and toothed, *petioles* often longer than the blades, the latter 2-6 cm. long, glands beneath as in *U. lobata*; *fls.* axillary and terminal, solitary or in clusters of several; *epicalyx* and *cal.* of equal length, 4 mm.; *pet.* pink, rather less than 1.5 cm. long; *carp.* somewhat less downy than in *U. lobata*.

Waste and cultivated grounds. Trinidad and Tobago.
West Indies, S. America, E. African Islands, S.E. Asia.

10. PAVONIA L.

Shrubs. Fls. solitary or in axillary clusters. *Epicalyx* of 5 bracteoles, free or united at the base with each other and with the calyx. *Cal.* 5-fid or 5-toothed. *Staminal column* truncate or 5-toothed. *Carp.* 5, 1-seeded, falling when ripe, 1-3-beaked on the back, more or less bivalved.

1. *P. spinifex* (L.) Cav.

Gr. Fl. 82 : Urb. Symb. Ant. 4. 396 : Fawc. and Rendl.

Fl. Jam. 5. 129 :

Britt. Fl. Ber. 237.

Shrub, 1-5 m., hairy ; *lvs.* ovate or oblong-ovate, 5-10 cm. long, *petioles* densely pubescent ; *fls.* solitary, on axillary peduncles much longer than the petioles ; *bracteoles* narrow, equalling the calyx, about 1 cm. long ; *cal.* lobes lanceolate to ovate-lanceolate ; *pet.* yellow, 2.5 cm. long ; *carps.* with 1 median and 2 lateral divergent awns, which are barbed with reflexed hairs.

No Trinidad material seen. Trinidad (ex Urban, the only record). Bermuda (introduced). Southern United States, Bahamas, W. Indies and Cont. Trop. America.

11. TYPHALAEA Neck.

Subshrubs or *shrubs. Fls.* in compact terminal heads, surrounded by an involucre of bracts. *Epicalyx* cleft to below the middle, longer than the calyx. *Carp.* glabrous, bearing at the top 3 long awns, barbed with reflexed hairs.

Epicalyx 5-fid1. *T. fruticosa*.

Epicalyx 9-14 fid.....2. *T. castaneifolia*.

1. *T. fruticosa* (Mill.) Britton.

Sida fruticosa Mill : Pavonia typhalaea Cav.

P. typhaleoides H.B.K.

Gr. Fl. 82 : Urb. Symb. Ant. 4. 397 : Britt. and Wils. Sc.

Surv. Porto Rico 5. 560.

Shrubby ; *lvs.* oblong or elliptical, petioled, toothed, with scattered stellate hairs on both surfaces, paler beneath, up to 22 cm. long ; *pedu.* of varying lengths ; *involucral bracts* linear-lanceolate ; *epicalyx* 1 cm. long, 5-fid, lobes ovate ; *pet.* twice the length of the calyx ; *carp.* convex on the back, 6 mm. long without the awns ; *awns* 4 mm.

Borders of woods and thickets. Trinidad.
West Indies, Central and S. America.

2. **T. castaneifolia** (St. Hil. and Naud.) Britton. *comb. nov.**Pavonia castaneifolia* St. Hil. and Naud.

Gr. Fl. 82.

Subshrub, 20 cm.; *lvs.* elliptical-lanceolate, or wedge-shaped obovate, tapering at both ends, irregularly toothed, glabrous except for scattered stellate hairs most abundant on the veins beneath, shortly petioled, blades up to 18 cm. long, and 5 cm. broad; *involucral bracts* linear; *epicalyx* 8 mm. long, 9-14 fid. lobes lanceolate; *pet.* white, longer than the epicalyx; *carp.* flat on the back, 9 mm. long without the awns, the middle awn longer than the other two, and as long as the carpel itself.

Forests in wet districts. Trinidad.

Brazil.

12. **MALACHE** B. Vogel.

Tall *shrubs* or small *trees*. *Lvs.* broad, lobed or nearly entire. *Fls.* large, stalked, axillary, solitary. *Epicalyx* present. *Cal.* 5-lobed. *Pet.* 5. *Carp.* usually 5, bivalved, knobbed on the back, not spined, leathery, tardily dehiscent.

1. **M. scabra** B. Vogel.*Pavonia racemosa* Sw.: *P. spicata* Cav.

Gr. Fl. 83: Urb. Symb. Ant. 4. 397: Britt. and Mills. Fl.

Bah. 271: Britt. Bull. Torrey Club 35. 344.

Shrub, 1-6 m., *branches* and *infl.* densely roughish-pubescent; *lvs.* ovate or heart-shaped, pointed, almost entire, *petioles* up to 6 cm., blades to 18 cm. long; *fls.* forming loose racemes; *bracteoles* 6-8, oblong-lanceolate, 1 cm. long; *cal.* about the same length; *pet.* pale yellow, about twice as long; *carp.* about 1 cm. long, glabrous, with 2 short, bluntish, erect beaks terminating the margins of the back.

Borders of mangrove swamps, Trinidad. Broadway, 3878, Tobago in Herb. Kew.

Florida, Bahamas, West Indies. Cont. Trop. America.

13. **LEBRETONIA** Schrank.

Shrubs. *Fls.* in long-stalked axillary heads, surrounded by an involucre of leafy bracts. *Carp.* 5, 1-seeded, indehiscent, smooth, not awned or beaked.

1. **L. sessiliflora** (H.B.K.) Britton. *comb. nov.**Pavonia sessiliflora* H.B.K.: *P. bracteosa* Benth.

Gr. Fl. 82.

Downy *shrub*, 1.5 m.; *lvs.* roundish, heart-shaped at the base, coarsely and irregularly toothed, velvety on both surfaces, whitish beneath, 3-5 cm. long; *pedu.* up to 10 cm. long; *epicalyx*

of 10-12 narrow bracteoles, 7 mm. long, broadened at the tip; *cal.* as long, 5-fid nearly to the base, the lobes lanceolate; *pet.* about twice as long; *carp.* 2.5 mm. long, convex on the back.

Savannahs and hillsides. Trinidad.

Northern South America.

14. PARITI *Adans.*

Trees. *Lvs.* broadly heart-shaped, petioled, with large deciduous stipules. *Fls.* terminal or axillary, solitary or few together. *Epicalyx* 8-10-toothed. *Cal.* 5-toothed. *Style* 5-branched. *Caps.* 5-celled, many-seeded, the cells partitioned vertically by a septum which splits at dehiscence into two membranes.

1. *P. tiliaceum* (L.) Juss. Seaside Mahoe.

Paritium tiliaceum A. Juss.: *Hibiscus tiliaceus* L.

Gr. Fl. 86: Urb. Symb. Ant. 4. 398: Britt. Fl. Berm. 239.

Tree, 8 m. or more; *lvs.* long petioled, velvety when young, blades up to 16 cm. wide, and nearly as long, entire or nearly so, veins prominent beneath; *stip.* 3 cm.; *epicalyx* 1.8 cm., 10-toothed; *cal.* about twice as long; *pet.* at first yellow, changing to a rich yellowish brown, about 5 cm. long; *caps.* ovoid, 2-2.5 cm. long, downy; *seeds* glabrous or minutely downy.

This species yields a useful fibre known as "Cuba bast."

Seashores. Trinidad and Tobago.

Seashores throughout the Tropics.

15. HIBISCUS L.

Herbs, shrubs, or small trees. *Lvs.* various, toothed or lobed. *Fls.* usually showy. *Bracteoles* numerous, narrow. *Cal.* 5-fid or 5-toothed. *Style* 5-branched. *Cap.* 5-celled, loculicidal. *Seed* kidney-shaped, glabrous or downy.

Several Old World species are commonly cultivated. A variety of *H. rosa-sinensis* L. is the favourite hedge plant in the colony; this species has many highly ornamental races. *H. mutabilis* L., the flowers of which change from white to red, is also grown for ornament. *H. Sabdariffa* L. (sorrel or roselle) is grown locally for its fleshy calyx, from which a drink is prepared, and elsewhere as a fibre plant.

Plant downy

Petals pink.1. *H. furcellatus.*

Petals yellow.2. *H. vitifolius.*

Plant not downy, sometimes armed with short spines.

Bracteoles forked at the tip.3. *H. bifurcatus.*

Bracteoles linear, not forked.4. *H. Lambertianus.*

1. *H. furcellatus* Lam.

Urb. Symb. Ant. 4. 399: Britt. and Wils. Sc. Surv. Porto Rico 5. 562.

Shrubby, 1-3 m., the *branches* and *leaves* densely stellate downy; *lvs.* somewhat heart-shaped, the larger 8-12 cm. long, dentate or somewhat 3-5 lobed, the apex acute, paler beneath; *bracteoles* about 10, cylindrical, forked; *cal.* hispid, the lobes triangular-lanceolate; *pet.* 6-8 cm. long, rose pink; *caps.* about 2.3 cm. long, a little shorter than the calyx; *seeds* glabrous.

San Fernando and Caroni Savannah, Trinidad.
Florida, Cuba, Dominica, Cent. and S. America, Sandwich Isles.

2. *H. vitifolius* L.

Gr. Fl. 85: Fawc. and Rendl. Fl. Jam. 5. 140.

Shrubby, about 1 m.; young *branches* and *leaves* velvety; *lvs.* roundish, usually deeply 3-lobed, sometimes 5-lobed, coarsely and irregularly toothed, *petioles* about as long as the blades, 2-10 cm.; *pedu.* axillary, slightly longer than the petiole of the subtending leaf, jointed, 1-flowered; *bracteoles* about 10, linear, simple, shorter than the calyx; *cal.* 5-cleft to about the middle, enlarging on the fruit to 1.5-2 cm. long, lobes ovate, pointed, 5-veined; *pet.* yellow, with a large purplish crimson spot at the base, 4-6 cm. long; *caps.* 5-winged, shorter than the calyx; *seeds* about 3 mm. long, minutely warty.

Herb. Trin. 11803, Williams, Lambeau, Tobago.

Naturalised in the West Indies. Native in Tropical Africa, India and Australia.

3. *H. bifurcatus* Cav.

Gr. Fl. 84: Urb. Symb. Ant. 4. 399.

Shrubby, 2-3 m.; *stems* and *petioles* rough with small warty spines; *lvs.* petioled, deeply 3-5 lobed, the lobes acute, coarsely toothed, almost glabrous, 7-12 cm. long; *fls.* axillary, on stalks about as long as the petioles, closing in the afternoon; *bracteoles* about 10, narrow, hispid, forked at the tip, 2 cm. long; *cal.* shorter, hispid, lobes ovate; *pet.* purple or pink; *caps.* ovoid, hairy, as long as the calyx; *seeds* glabrous, slightly warty.

Moist open grounds, Cedros, Trinidad.
West Indies, Mexico to Brazil.

4. **H. Lambertianus** H. B. K.

Urban, Fedde Rep. 16. (1919) 33.

Shrubby, 1-2 m.; *lvs.* coarsely toothed, upper ones oblong, acuminate, lower spearhead-shaped, with 2 prominent lateral lobes at the base, 8-16 cm. long, with scattered stellate hairs, more abundant on the veins beneath: *main veins* beneath, *petioles* and *branches* sometimes armed with short spines; *fls.* axillary; *bracteoles* about 10, linear, hairy, 1-2 cm. long; *cal.* 2 cm. long, increasing to 3 cm. on the fruit, stellate-downy with long hairs on the veins; *pet.* dark red, 5-6 cm. long; *pollen* blue; *caps.* hispid, woody, 2.5 cm. long; *seeds* thickly stellate-pubescent.

Oropuche Lagoon, Chaguanas, Caroni, Trinidad.
Cuba and South America to Uruguay.

16. **ABELMOSCHUS** Medic.

Tall *herbs*. *Lvs.* lobed. *Fls.* axillary, solitary. *Epicalyx* of 4 to numerous bracteoles. *Cal.* deciduous. *Staminal tube* toothed at the top. *Stig.* 5, short. *Caps.* elongated, pointed, usually 5-celled, loculicidal, the cells many-seeded. *Seeds* naked.

A. esculentus (L.) Moench. is the ochro, largely cultivated, and occasionally found escaped, but scarcely naturalised.

1. **A. Abelsonschus** (L.) Cook and Collins. Musk Ochro.

Hibiscus Abelsonschus L.

Gr. Fl. 84. (as *A. moschatus*).

Coarse, hispid *herb*, 0.5-1.5 m.; *lvs.* variable, often arrow-shaped at the base, lower commonly 5-lobed, upper 3-lobed, sometimes spearhead-shaped, lobes varying from ovate to narrow-oblong, coarsely toothed, *petioles* 3-15 cm., blades 5-15 cm. long occasionally more; *pedi.* nearly as long as the petioles; *bracteoles* usually 4-10, narrow, about 1 cm. long; *cal.* three times as long, splitting down one side as the flower opens and falling soon after; *pet.* yellow, crimson-blotched at the base, 6-7 cm. long; *caps.* 6-7 cm. long; membranous when ripe; *seeds* kidney-shaped, finely lined.

In open grounds. Naturalised in Trinidad and Tobago.

A native of the E. Indian region, cultivated for its aromatic seeds, and now distributed throughout the Tropics.

17. **THESPESIA** Soland.

Trees or *shrubs*. *Lvs.* entire or angularly lobed, petioled. *Fls.* showy. *Epicalyx* of 3-5 narrow, deciduous bracteoles. *Cal.* truncate or shallowly 5-toothed. *Caps.* woody to leathery, 5-celled, each cell several-seeded, indehiscent.

1. **T. populnea** (L.) Soland. Seaside Mahoe.*Hibiscus populneus* L.

Gr. Fl. 87: Urb. Symb. Ant. 4. 401: Baker J. Bot. 35: 51:

Britt. Fl. Ber. 240.

Shrub or tree, up to 20 m.; *lvs.* heart-shaped, acuminate, blades 5-15 cm. long, leathery, glabrous; *pedi.* shorter than the petioles, axillary, solitary; *cal.* cup-shaped, entire; *pet.* yellow, crimson-blotched at the base, changing to reddish with age, 5 cm. long; *caps.* globose, 3-4 cm. wide; *seed* 1 cm. long, prominently veined, covered with short adpressed hairs.

Seashores. Trinidad and Tobago.

Throughout the Tropics. Native, according to some authorities, of America; according to others, of the East.

18. **CIENFUGOSIA** Cav.

Subshrubs. *Fls.* axillary, solitary. *Epicalyx* often small and deciduous. *Cal.* black-dotted, 5-fid. *Style* 3-4 ribbed. *Caps.* loculicidal, 3-4 valved. *Seeds* woolly.

1. **C. heterophylla** (Vent.) Garcke.*Fugosia heterophylla* Benth.

Britt. and Wils. Sc. Surv. Porto Rico. 5. 566.

Subshrub, 0.5-1 m.; young parts pubescent with stellate down; *stems* erect, angled; *lvs.* lanceolate to ovate or elliptical, apex with a minute point, *petioles* about 1 cm., blades up to 6 cm. long, entire; *fl. stalks* slender, about 5 cm. long, increasing up to 10 cm. on the fruit; *bracteoles* 10, linear, shorter than the calyx tube; *cal.* 5-fid nearly to the base, lobes narrow, pointed; *pet.* purple at the base, 2 cm. long; *caps.* globose, 1 cm. diam., shorter than the calyx, *valves* ovate, fringed with silky hairs; *seeds* numerous, 3 mm. long, densely covered with a whitish or brown wool.

Coastal sands. Chacachacare.

Florida, Cuba, Porto Rico, Margarita, Curacao, Aruba, Colombia to Brazil.

19. **GOSSYPIUM** L.

Tall *herbs*, *shrubs*, or almost *trees*, usually black-dotted with glands in all their parts, with branches of two kinds, the lower vegetative, the upper fruiting. *Lvs.* 3-9-lobed. *Fls.* large, showy, solitary at the nodes of the fruiting branches. *Epicalyx* of 3 bracteoles, large, leafy, more or less heart-shaped, usually, deeply incised. *Cal.* truncate or 5-toothed. *Pet.* usually yellow.

asymmetrically wedge-shaped. *Style* club-shaped, furrowed at the apex, furrows typically 3 or 4, occasionally 2 or 5. *Caps.* loculicidal, cells as many as the furrows of the style, many-seeded. *Seeds* naked or variously covered with a white, green or brown fuzz, beneath a floss of white or brown, convoluted, unicellular hairs.

Sea Island cotton (*G. barbadense* var. *maritimum*), Upland cotton (*G. hirsutum*), and some Indian species are grown experimentally in the Colony. Apart from these, cotton bushes are found everywhere in yards and often in waste places. Most of these show affinities to several species, from which they have probably descended by the intercrossing which takes place so readily in the genus, and renders absolute determination in many cases impossible.

- Seeds free 1. *G. purpurascens*.
 Seeds agglomerated..... 2. *G. lapideum*.

1. *G. purpurascens* Poir. Bourbon Cotton.

Bushy perennial, 2-3 m. or more; branches angled, purplish or green; *lvs.* deeply lobed, except the upper ones which are sometimes entire, lobes usually 3, occasionally 5, oblong, pointed, hairy below, especially on the veins, *petioles* 2-6 cm., blades 6-15 cm. long, *stip.* about 1 cm., deciduous; *bracteoles* deeply incised, teeth 5-9, narrow, central one larger than the rest; *cal.* lobes usually acuminate; *pet.* about 3 cm. long, yellow, often purple-blotched at the base; *caps.* roundish, acuminate, smooth, with the gland buried, 3-5-valved, about 3 cm. long, no longer than the bracteoles, which grow with it; *seeds* 7 mm. long, usually with a green fuzz (brownish with age) below the floss.

Trin. Herb. 9502 and others, bearing the name *G. peruvianum* Cav., are in the opinion of Dr. S. C. Harland most nearly related to *G. purpurascens*, though with fuzz, and some other characters of *G. punctatum* Sch. and Thonn. Probably hybridised at some past time. Description from the local plants; for typical *G. purpurascens* see Watt, *Wild and Cultivated Cotton Plants of the World*. London, 1907, p. 250.

Coastal banks and waste grounds inland. Perhaps native, but of ancient cultivation and possibly naturalised in Trinidad and Tobago. Tropics of both Hemispheres.

2. *G. lapideum* Tussac. Kidney Cotton.

G. brasiliense Macf.

Watt loc. cit. p. 295.

Shrub or small tree; branches rounded below, angled above, usually purplish, glabrous, glands prominent; *lvs.* almost glabrous, except when very young, heart-shaped at the base, 5-(upper often

3-) lobed to a little beyond the middle, lobes ovate to oblong, acuminate, spreading, the central one 5-8 cm. wide, *petioles* 5-10 cm., blades up to 20 cm. long, and 25 cm. from point to point of the lateral lobes, *stip.* linear-lanceolate, those of the flowering branches often broad, oblique; *bracteoles* at flowering 4-6 cm. long, teeth 9-13, narrow, tapering to a long point, central tooth usually the longest, 1.5-2 cm. long; *cal.* lobes broadly triangular, bluntish or rounded; *pet.* pale yellow, changing to pink with age, reddish-blotched at the base, 6-8 cm. long; *caps.* oblong, acuminate, pitted, 6-7 cm. long, 3-celled, dehiscing for little more than half its length, *valves* erect with a recurved beak; *seeds* of each cell joined into one mass, the individual seed nearly 1.5 cm. long, naked beneath the floss except for a tuft of fuzz at the beak, floss abundant, usually fine and silky.

Cultivated; sometimes spontaneous in waste grounds. Probably naturalised, Trinidad and Tobago.

S. America. Cultivated throughout the tropics.

FAMILY 2. BOMBACACEAE.

Trees. *Lvs.* alternate, simple or palmately compound. *Stipules* early deciduous. *Fls.* perfect. *Cal.* closed in the bud, bursting at the apex, cup-shaped, truncate or irregularly 5-lobed, persistent. *Pet.* 5. *Stam.* usually numerous, united into a tube at the base and into bundles above; *anths.* 1-celled. *Ovary* superior, 2-5 celled; *style* simple or divided into a similar number of branches as the ovary cells. *Caps.* usually loculicidally dehiscent. *Seeds* often embedded in hairs from the wall of the fruit.

Lvs. palmately compound.

Pet. elongate, 10-28 cm. long. *Stam.* numerous, united into a column of varying length at the base.....1. *Pachira.*

Pet. 2.5-3 cm. long, staminal column 5-branched from near the base, each branch with 2 or 3 anths.2. *Ceiba.*

Lvs. simple.3. *Ochroma.*

1. *PACHIRA* Aubl.

Trees. *Lvs.* palmate, compound, composed of 3-9, entire leaflets. *Fls.* usually solitary, axillary, with 2-3 bracts. *Cal.* subtubulose, truncate or obsoletely dentate. *Pet.* oblong or linear, white or red, often woolly outside, reflexed on opening. *Stam.* numerous, united into a tube at the base, variously united

into bundles at the middle, free above. *Ovary* 5-celled; *ovules* numerous; *stig.* entire, 5-lobed. *Caps.* large, varying in shape from ovoid to depressed globose.

Stam. white below, crimson above; *lvs.*

somewhat distant on the stems.....1. *P. aquatica*.

Stam. white; *lvs.* crowded together at

the ends of the branches.2. *P. insignis*.

1. *P. aquatica* Aubl. Wild Chestnut, Wild Chataigne, Chataigne Maron, Cacao Maron.

Carolineae princeps L. fil.

Gr. Fl. pp. 87-88: Pittier, in Cont. from the U.S.A. Nat. Herb. 18. 160, plates 70-71.

Spreading tree; *lfts* 5-9, elliptical-oblong, obovate-oblong, or elliptical-lanceolate, glabrous, the apex acute or obtuse, the base wedge-shaped, 25 cm. long and 10 cm. broad or less, *petiole* 23 cm. long or less; *pedu.* 2-4 cm. long; *cal.* about 2 cm. long, rough, rusty and minutely warty outside, silky within; *pet.* greenish or brownish yellow, about 28 cm. long and 12 mm. broad, obtuse, minutely woolly on both sides, the hairs star-shaped; *stam.* white, except the upper part of the filaments which are crimson, column 6-8 cm. long, *stam.* about 15 cm. long from the top of the column; *style* crimson above, white and pilose below, nearly as long as the petals; *pod*s 33 cm. long or less, ovoid to oblong-ovoid, the apex narrowed and blunt or depressed, exterior more or less ridged and furrowed longitudinally, rough and brownish in colour, interior felted; *seeds* about 3 cm. diam.

Doubtfully native; the only records are from cultivated trees in the Queen's Park and Botanic Gardens, Trinidad.

St. Lucia, Guadeloupe, Panama, Colombia, Surinam, Brazil (ex Gr.)

2. *P. insignis* Sw. Wild Chataigne, Wild Breadnut, Wild Chestnut, Chataigne Maron.

Griseb. Fl. p. 88: Pittier in Cont. from the U.S.A. Nat. Herb. 18. 160 t. 72-73: Bull. Dept. of Agri. 19. (1922) 182-183.

Tall tree; *lfts.* usually 7, obovate-oblong, the apex emarginate and apiculate, the base wedge-shaped, 35 cm. long, and 12 cm. broad or less, glabrous, *petioles* about 25 cm. long, swollen at the base; *cal.* tubular, bell-shaped, 3-3.5 cm. long, minutely woolly on both sides; *pet.* pink on both sides, 23 cm. long and 2 cm. broad; *stam.* white throughout, about 20 cm. long including the column; *pod* more or less rounded at the base.

The tree has an attraction for Cacao beetles which lay their eggs on the trunk and branches, and fresh pieces of the wood are made use of to trap them.

Common in moist districts, Trinidad. Tobago.
Martinique, Grenada, Venezuela, Brazil.

DOUBTFUL SPECIES.

P. trinitensis Urb. in Aus. Notizbl. Bot. Gart. u. Mus. Berlin—
Dahlem Bd. 8. (1921) p. 28.

Probably conspecific with *P. emarginata* A. Rich.

Crueger No. 317, and Herb. Trin. 4501b, 1775, 6968, and two sheets without data.

The specimens were all from a cultivated tree in the Botanic Gardens which no longer exists.

2. CEIBA Gaertn.

Trees, armed or unarmed. Lvs. palmately compound; lfts. 3-7, entire. Fls. clustered in the axils. Cal. 5-lobed. Pet. hairy outside, glabrous within. Staminal column divided into 5 branches, each bearing 2 or 3 1-celled anthers. Caps. 5-celled, loculicidally dehiscent, woody or leathery. Seeds numerous, covered with the long wool of the endocarp.

1. **C. pentandra** (L.) Gaertn. Silk Cotton Tree. Ceiba.

Bombax pentandrum L.

Eriodendron anfractuosum DC.

Urb. Symb. Ant. 8. 428; Fawc. and Rendl. Fl. Jam. 5. 150;

Britt. and Wils. Sc. Surv. Porto Rico 5. 569.

A gigantic tree, reaching 60 m. or more, with many huge buttresses at the base, the branches horizontal, the trunk and branches spiny when young; lfts. 5-7, lanceolate, oblanceolate or oblong, 8-15 cm. long, 2-3 cm. broad, narrowed at both ends, sessile or shortly stalked, glabrous or with a few hairs on the midrib above, petioles slender, glabrous, 5-16 cm. long; cal. cup-shaped, 1-1.5 cm. long; pet. 2.5-3 cm. long, white or rose, white woolly outside, slightly exceeded by the stamens; stig. capitate; caps. oblong-ellipsoidal, 8-12 cm. long or sometimes longer; seeds 4-6 mm. diam. The silky fibre in which the seeds are embedded is used for stuffing cushions, life belts, &c. The wood is soft and light and of little value.

Common, Trinidad and Tobago.

West Indies, Northern S. America, Old World Tropics.

3. OCHROMA Sw.

Trees. *Lvs.* simple, subentire, toothed or angular-lobed. *Fls.* large, stalked, borne at the ends of the branches. *Cal.* 5-lobed, the lobes unequal. *Pet.* 5. *Staminal tube* shortly 5-lobed, covered at the top with many twisted anthers. *Ovary* 5-celled; *ovules* numerous. *Stig.* 5, spirally twisted and furrowed. *Caps.* linear, loculicidally 5-valved, densely woolly within. *Seeds* obovoid, enclosed in the wool of the endocarp.

1. *O. pyramidale* (Cav.) Urb. Balsa, Bois Flot, Cork Wood, Down tree.

O. Lagopus Sw.

Bombax pyramidale Cav.

Urb. in Fedde Repert. Beih. 5. (1920) 123; Fawc. and Rendl. Fl. Jam. 5. 152-153; Britt. and Wils. Sc. Surv. Porto Rico 5. 569-570.

Tree about 18 m. high, the *trunk* smooth; *lvs.* suborbicular, 1.5-3 dm. broad, palmately veined, stellate-pubescent beneath, the *petioles* about as long as the blades; *fls.* solitary; *cal.* tubular, 6-8 cm. long, the lobes 1-3 cm. broad, velvety inside, pubescent outside; *pet.* about 12 cm. long, obovate, clawed; *stig.* about 2.5 cm. long; *caps.* 1.5-3 dm. long and 4-5 cm. diam., containing an abundance of brownish wool and numerous *seeds* 3 mm. long and 1 mm. diam.

The fibre is made use of for stuffing cushions, &c., and the wood, which is the lightest of all woods for floating fishing nets, &c.

"During the war attention was first directed to its use in "aeroplanes, and for life boats, and life-rafts used in men-of-war, "as well as transport; while special refrigerating trucks, with "balsa as the insulating material, were used in France. In "constructing the submarine mine barrage in the North Sea, "250 miles long, 80,000 floats made of balsa wood were used." Fawc. and Rendl. loc. cit.

Hillsides and woodlands in moist districts. Trinidad. Tobago. West Indies, Central America and northern South America.

FAMILY 3. STERCULIACEAE.

Herbs, shrubs or trees, often with stellate hairs. *Lvs.* alternate, simple, lobed or digitate, usually toothed. *Stip.* usually present. *Fls.* regular, usually perfect, axillary, or rarely terminal, clustered, or rarely solitary. *Cal.* deeply 5-lobed, persistent, the lobes valvate. *Pet.* 5, hypogynous, often persistent after withering

or none. *Stam.* 5 or more, generally united below into a tube; *staminodes* sometimes present; *anths.* usually 2-celled. *Ovary* superior, 2-5 celled, or sometimes with only 1 carpel as *Waltheria*; *styles* usually as many as the carpels, free or more or less united. *Fruit* mostly capsular or follicular, usually dehiscent, the *carpels* sometimes separating. *Seeds* not woolly.

The most important plant of this order is the Cacao, *Theobroma Cacao* L. which is largely cultivated in both Trinidad and Tobago and is first in importance of the agricultural crops.

Fls. unisexual or polygamous. 1. *Sterculia*.

Fls. hermaphrodite.

Carpels spirally twisted 2. *Helicteres*.

Carpels not spirally twisted.

Caps. spiny or warty.

Cal. 2-3-lobed. 3. *Guazuma*.

Cal. 5-lobed. 4. *Buettneria*.

Caps. not spiny or warty.

Caps. 5. 5. *Melochia*.

Caps. 1. 6. *Waltheria*.

1. STERCULIA L.

Trees. *Lvs.* simple, lobed, or digitate. *Infl.* paniculate or rarely racemose, usually axillary. *Fls.* unisexual or polygamous. *Cal.* 5-lobed or 5-parted, rarely 4, usually coloured. *Pet.* o. *Gonophore* (a stalk bearing stamens and carpels) slightly shorter than the calyx. *Staminal column* with 10-15 anthers crowded at the apex. *Ovary* 5-celled, subdistinct, united at the apex by the styles. *Ovules* 2-numerous; *stig.* peltate or lobed. *Carpels* distinct when mature, usually opening on the inner side. *Seeds* 1 to numerous in each carpel.

Lvs. on the flowering branches entire. . . . 1. *S. caribaea*.

Lvs. 5-lobed on the flowering branches. . . 2. *S. apetala*.

1. *S. caribaea* R. Br. Mahoe. Salt Fish Wood.

Griseb. Fl. 90: Fawc. and Rendl. Fl. Jam. 5. 170.

A tall tree; *lvs.* of two forms, those on the lower part of the tree usually palmately 5-lobed or sometimes 3-lobed, 20-40 cm. long, about as long as their stalks, those on the flowering branches entire, ovate-oblong or ovate-elliptical, pointed at the apex, rounded at the base, 24 cm. long or less, the *petioles* usually much shorter than the blades, glabrous above, puberulent and glaucous beneath; *panicles* 5-18 cm. long, minutely woolly; *male fls.*: *cal.* 10-15 mm. long, yellowish, united at the base, the lobes oblong-lanceolate, spreading, glandular inside, tomentose on both sides; *gonophore*

about 6 mm. long; *staminal tube* about 0.5 mm. long; *anths.* 8-10; *ovary* undeveloped; *hermaphrodite fls.*; *anths.* about 7; *ovary* woolly; *style* bent downwards; *fruit carps.* about 4-6 cm. long and 8 mm. broad, minutely rusty-woolly outside and with long silky, brownish, spiny hairs within.

It is very doubtful if *S. caribaea* R. Br. can be distinguished specifically from the Guiana *S. pruriens* K. Schum. (*Ivira pruriens* Aubl.), as the character of the indumentum of the lower surface of the leaves is of uncertain value and specimens from British Guiana are intermediate.

Central and Northern Trinidad.

Jamaica, Montserrat, Dominica, Martinique, St. Lucia, St. Vincent and British Guiana.

2. *S. apetala* (Jacq.) Karst.

S. carthaginensis Cav.

Fawc. and Rendl. Fl. Jam. 5. 169-170.

Tall tree; *lvs.* deeply 3-5 lobed even on the flowering branches, up to 30 cm. or more diam., shining above, woolly beneath; *petioles* 10-20 cm. long, more or less woolly above; *panicles* terminal, 20-25 cm. long, woolly, unisexual or with male and hermaphrodite flowers; *cal.* bell-shaped, 15-18 mm. long, divided to the middle, dirty-yellow within with purple spots and lines; *male fls.*: *gonophore* 10-13 mm. long, curved; *staminal tube* short; *anths.* 7-15; *ovary* rudimentary; *hermaphrodite fls.*: *gonophore* shorter than the male; *staminal tube* shallow, cup-like; *anths.* 12-16; *ovary* 3 mm. diam., woolly; *style* bent downwards; ripe *carpels* spreading, 6-12 cm. long, covered inside with a dense layer of erect, stiff, yellowish, prickly hairs about 2 mm. long; *seeds* 2-4 in each carpel, ellipsoidal, black, about 2 cm. long.

Naturalized. Fendl. 526, in Herb. Kew. Trinidad.

Central America, Colombia, Venezuela, Paraguay. Naturalized in Jamaica.

2. *HELICTERES* Jacq.

Shrubs or *trees* with stellate hairs. *Fls.* axillary, solitary or clustered. *Cal.* tubular, 2-lipped, the apex 5-lobed. *Pet.* 5, clawed, the claws eared, elongated. *Gonophore* exceeding the calyx, curved. *Stam.* 5-10, sessile or subsessile. *Ovary* 5-celled; *styles* 5, free or united; *stig.* small, capitate. *Fruit* of 5 follicles, (spirally twisted in the Trinidad sp.) dehiscent on the inside. *Seeds* numerous.

1. *H. baruensis* Jacq.

Gr. Fl. 89.

Small shrub or tree, the stems woolly; *lvs.* ovate or heart-shaped, the apex acute or obtuse, the base rounded, 10 cm. long, 8 cm. broad or less, irregularly toothed, puberulous above, densely hoary woolly beneath, *petioles* 1.2 cm. long, woolly; *cal.* 2.5 cm. long, the lobes unequal; *pet.* green, threadlike, blunt, about 3 cm. long with 2 ears at the middle; *gonophore* 8 cm. long; *stam.* 10; *fil.* short, curved; *anths.* 2-celled, the cells divergent; *staminodes* 5, forming an inner whorl; *styles* united, exceeding the stamens; *follicles* woody, 2-4.5 cm. long, 10-12 mm. broad, woolly, the *carps.* closely spirally twisted, beaked; *seeds* about 2 mm. long.

Hillsides, Monos and Chacachacare.
Mexico, and Northern South America.

3. *GUAZUMA* L.

Trees stellate woolly or glabrescent. *Lvs.* unequal toothed, often oblique, stipulate. *Fls.* small in short-stalked, axillary cymes. *Cal.* 2-3 lobed. *Pet.* 5, hooded-concave, the apex 2-cleft with a linear 2-cleft appendage. *Staminal column* cup-shaped, bearing 5 stamens, each with 2 to 3 2-celled anthers and 5 staminodes. *Ovary* sessile, 5-lobed and 5-celled; *ovules* numerous; *styles* 5, more or less united. *Fruit* a subglobose, woody, warty-spiny capsule.

1. *G. ulmifolia* Lam. Bois d'orme. Bastard Cedar. West Indian Elm.

G. Guazuma Cockerell: G. tomentosa H.B.K.

Fawc. and Rendl. Fl. Jam. 5. 157: Britt. and Wils. Sc. Surv. Porto Rico 5. 575.

Tree up to 20 m., the twigs woolly; *lvs.* variable, ovate to oblong-lanceolate, 6-12 cm. long, 3-4.5 cm. broad, the apex acute or acuminate, the base obtuse or somewhat heart-shaped, often unequal, papery, glabrous or minutely hairy above, minutely hairy or more or less woolly beneath when young, becoming almost glabrous; *petioles* 1-1.5 cm. long; *fl. clusters* rather longer than the petiole; *cal.* about 3 mm. long, woolly outside; *pet.* yellow, 3-4 mm. long the appendage about 4 mm. long, divided; *fruit* purplish-black, globose or ellipsoidal, warty, 1-2.5 cm. long; *seeds* 3.5-4 mm. long.

A decoction made from the bark of the tree was formerly used by some planters in polishing dried cacao beans for market.

Since the abolition of claying cacao its use has been abandoned. The timber is recorded by Fawc. and Rendl. as being used in Jamaica for barrel staves and by carriage builders.

Hillsides and Forests in moist and dry districts. Trinidad.
Broadway, 4822, Rockley Vale, Tobago.
West Indies, Continental Trop. America.

4. BUETTNERIA L.

Shrubs, erect or climbing, often prickly. *Fls.* small, in axillary umbels or panicles. *Cal.* 5-fid. *Pet.* 5, clawed and hooded at the base, joined to the sterile lobes of the staminal column by the margin of the limb, the lobes erect, strap-shaped. *Staminal tube* urn-shaped with 5 staminodes and 5 stamens, the *stamens* opposite the petals; *anths.* 2-celled, subsessile. *Ovary* 5-celled; *ovules* 2 in each cell; *stig.* 5-lobed. *Caps.* globose, prickly or spiny, 5-celled, the *cells* 1-seeded by abortion.

Lvs. linear, stems prickly. 1. *B. scabra*.

Lvs. heart-shaped, stems unarmed. 2. *B. catalpaefolia*.

1. *B. scabra* L.

Aubl. Pl. Guiana t. 96: Gr. Fl. 92.

Trailing *shrub*, the *stems* prickly, angular above, glabrous; *lvs.* rigid, linear or linear-lanceolate, mucronate, entire, the margin scabrous, up to 15 cm. long and 1 cm. broad, glabrous, the veins prominent on both sides; *petioles* prominently angled and prickly, 2 cm. long on the lower leaves the upper subsessile; *cal.* segments lanceolate, 2-4 mm. long; *pet.* obcordate, about 1 mm. long, longer than the column, with a linear puberulous limb about 3 mm. long; *caps.* 7-8 mm. long, prickly, splitting into 5 parts; *seeds* ovate, pointed, 4 mm. long.

Arouca Savannah and Icacos, Trinidad.
St. Vincent, S. America.

2. *B. catalpaefolia* Jacq.

Climbing *shrub*, the *stems* unarmed, minutely pubescent; *lvs.* heart-shaped, the apex acuminate, the base rounded, 19 cm. long, 14 cm. broad or less, papery, entire, puberulous, *petioles* 5-11 cm. long, round, pubescent; *fls.* in panicles about as long as the *petioles*, puberulous; *cal.* segments lanceolate, acuminate, 5-6 mm. long; *pet.* about 1 mm. long, the linear appendage 4-5 mm. long, column about 1 mm. long; *fruit* about 1.5 cm. diam., thickly spiny, the spines about 8 mm. long or less.

Maracas, Chatham and Irois. Trinidad.
Central America and Northern South America.

5. MELOCHIA L.

Herbs, shrubs or trees with stellate and simple hairs. *Lvs.* serrate, narrow, ovate or broadly heart-shaped. *Fls.* small, hemaphrodite, in axillary or terminal clusters or panicles, heterostyled (both short and long styled). *Cal.* 5-lobed or 5-toothed, persistent. *Pet.* 5, spatulate or oblong, withering without falling. *Stam.* 5, opposite the petals, united into a tube at the base, staminodes rarely present; *anths.* with 2 parallel cells. *Ovary* 5-celled with 2 ovules in each cell. *Styles* 5, free, or more or less united. *Caps.* 5-valved, 5-10-seeded.

Capsule pyramidal, wing-angled.

Infl. opposite the leaves.....1. *M. fasciculata*.

Infl. axillary.....2. *M. tomentosa*.

Capsule globose, not wing-angled.

Stems silky.....3. *M. villosa*.

Stems puberulous.

Pedu. none or very short, the fls.

subsessile.....4. *M. nodiflora*.

Pedu. as long as or longer than the

petiole, the fls. stalked.....5. *M. lanceolata*.

1. *M. fasciculata* Benth.

Hook. Journ. Bot. 4. 127 (1842): R.E. Fries in Svensk. Vet. Akad. Handl. 42. No. 12, p. 8. (1908).

Shrub, the young branches slender, woolly; *lvs.* oblong, oblanceolate or obovate, acute or obtuse at the apex, 2.5 cm. long and 7 mm. broad or less (the leaves of continental specimens are often broader), irregularly toothed, puberulous on both sides, *stip.* awl-shaped, about 4 mm. long; *infl.* hairy, opposite the leaves, sessile or very shortly stalked, the *fls.* stalked; *cal.* 5-6 mm. long, the lobes ovate, with a long acuminate apex; *pet.* about 10 mm. long; *staminal tube* 1.5-2 mm. long, *fil.* as long as the petals in the short styled form and about half as long in the long styled form; *fruit* about 6 mm. long, puberulous, 5 wing-angled, the apex beaked, the beaks about 1 mm. long; *seeds* about 2 mm. long, grey with striped markings.

Herb. Trin. 8077, Freeman, no locality. Trinidad.
Venezuela, Guiana, Brazil and Paraguay.

2. *M. tomentosa* L.

Fawc. and Rendl. Fl. Jam. 5. 166.

Low *shrub*, the *stems* woolly with stellate hairs; *lvs.* ovate to oblong-lanceolate, the apex acute or obtuse, the base rounded or truncate, 7 cm. long or less, irregularly and deeply toothed,

woolly on both sides, greyish beneath, *petioles* of varying length, woolly; *stip.* awl-shaped, 4-7 mm. long; *infl.* axillary, stalked, *pedu.* about as long as the petiole, about 5-10 fld.; *fls.* shortly stalked; *cal.* 6 mm. long, woolly outside, the lobes lanceolate-acuminate; *pet.* rosy-purple, oblanceolate, about 10 mm. long; *staminal tube* about 3.5 mm. long, *fil.* 5-6 mm. long; *ovary* shortly stalked, puberulous; *styles* united for about one-third their length, puberulous; *caps.* about 8 mm. long, puberulous, 5 wing-angled, the apex beaked, the beaks about 2 mm. long; *seeds* about 2 mm. long, brown.

Patos.

Florida, Bahamas, West Indies, Texas to Trop. America.

3. *M. villosa* Fawc. and Rendl.

M. hirsuta Cav.: *Reidlea serrata* Vent.: *Sida villosa* Mill.
Fawc. and Rendl. Fl. Jam. 5. 165; Urb. Symb. Ant. 4. 405
and 8. 430.

Low shrub, the stems densely clothed with long, spreading, silky, yellowish or rusty hairs; *lvs.* ovate-oblong to ovate-elliptical, the apex acute or obtuse, the base rounded, 2-6 cm. long, irregularly toothed, densely silky hairy on both sides, *petioles* up to 1 cm. long; *stip.* 5-6 mm. long, lanceolate; *infl.* a terminal interrupted or compact leafy spike, composed of dense axillary sessile or subsessile clusters; *involucre* of 3-4 linear bracts, 6-8 mm. long; *cal.* 4 mm. long, hirsute, the lobes ovate, acuminate; *pet.* purplish, 6-10 mm. long, obovate, narrowed to a claw at the base which is joined to the staminal tube (the *staminal tube* and *pistil* vary in length in the two kinds of flowers); *caps.* globose, hirsute, about 3 mm. long, *seeds* mottled.

Chacachacare and Savannahs, Trinidad.

S. Florida to Cont. Trop. America.

4. *M. nodiflora* Sw.

Fawc. and Rendl. Fl. Jam. 5. 164.

Shrub up to 2 m. the branches slender and puberulous; *lvs.* ovate, the apex acute or acuminate, the base rounded, 8 cm. long or less, irregularly toothed, papery; *fls.* in dense, globose, subsessile, axillary clusters; *cal.* 3-4 mm. long, hirsute, the lobes lanceolate; *pet.* pale pink with dark red lines, about 5 mm. long, obovate-oblong; *staminal tube* 2 mm. long; *anths.* sessile; *ovary* sessile, hirsute; *styles* free; *caps.* 5-lobed, globose, about 3 mm. long, hirsute, separating when ripe; *seeds* about 2 mm. long.

St. Clair and Arima, Trinidad.

Bahamas, West Indies, Central America, Colombia, Bolivia.

5. *M. lanceolata* Benth.

Hook. Journ. Bot. 4. 128. (1842).

Shrub, stems puberulous; *lvs.* ovate to ovate-lanceolate or lanceolate, the apex acuminate, the base rounded or truncate, up to 8 cm. long and 1.5-3 cm. broad or less, irregularly toothed, puberulous to glabrous on both sides, *petioles* 1-2 cm. long, puberulous; *fls.* violet, in axillary, stalked clusters, about 2.5 cm. long; *pedi.* puberulous; *cal.* 1 mm. long, entire, with 5 teeth about 0.25 mm. long, puberulous; *pet.* obovate-oblong, 5 mm. long; *staminal tube* about 1 mm. long, *anths.* sessile; *ovary* puberulous; *styles* united for about half their length; *caps.* globose, 5-celled, puberulous, with gland-tipped hairs the cells 1-seeded; *seeds* brown, about 2 mm. long.

Herb. Trin. 1868, without date or locality.

British and Dutch Guiana.

6. *WALTHERIA* L.

Herbs or shrubs with stellate and simple hairs. *Lvs.* toothed. *Stip.* narrow. *Fls.* small, in axillary or terminal clusters. *Bracteoles* three. *Cal.* 5-lobed. *Pet.* oblong-spathulate, marcescent. *Stam.* 5, united at the base, opposite the petals; *staminodes* none; *anths.* with 2-parallel cells. *Ovary* sessile, 1-celled with 2-ovules; *style* simple, slightly lateral; *stig.* club-shaped or fringed. *Caps.* 2-valved. *Seeds* solitary.

1. *W. americana* L.

Subshrub about 1 m. high, the stems woolly; *lvs.* ovate to oblong, the apex usually obtuse, the base rounded or heart-shaped, 1-9 cm. long, woolly on both sides, *petioles* up to 2 cm. long; *stip.* awl-shaped, 3-6 mm. long; *fls.* in dense, sessile or stalked, axillary clusters; *bracteoles* linear, 3-4 mm. long, hairy; *cal.* 4-5 mm. long, hairy, the lobes awl-shaped; *pet.* yellow, about 6 mm. long; *staminal tube* 2 mm. long; *ovary* hairy; *caps.* 2-3 mm. long, pubescent.

Hillsides in dry districts, Trinidad mainland and Bocas Islands.
Tropical and sub-tropical regions.

FAMILY 4. *TILIACEAE*.

Shrubs or trees, rarely herbs. *Lvs.* alternate, rarely opposite or subopposite, simple, entire, toothed or lobed. *Stip.* usually present. *Infl.* axillary or terminal, solitary or few fld., generally cymose, sometimes in corymbs or panicles. *Fls.* regular, hermaphrodite, sometimes polygamous. *Sep.* 5, rarely 4-7, free or cohering, or united into a bell-shaped calyx, valvate. *Pel.* usually as many as the sepals, inserted around the base of the

receptacle or none. *Stam.* mostly numerous, borne on the receptacle, free or shortly united at the base into 5 or 10 bundles; *anths.*, 2-celled, longitudinally dehiscent or by a pore at the apex. *Ovary* superior, sessile, 2-10-celled or more, *style* usually simple, the lobes equal in number to the cells of the ovary; *stig.* rarely sessile; *ovules* on axile placentas. *Fruit* dry, drupe-like or berry-like, indehiscent or variously dehiscent, 2-numerous celled, or by abortion 1-celled. *Seeds* solitary or numerous.

Herbs or shrubs.

Fruit subglobose covered with hooked prickles 1. *Triumfetta*.

Fruit linear-oblong, not prickly. 2. *Corchorus*.

Trees.

Fruit a winged capsule 3. *Carpodiptera*.

Fruit a capsule, not winged.

Caps. depressed globose. 4. *Apeiba*.

Caps. compressed ellipsoidal.

Caps. 4-valved. 5. *Sloanea*.

Caps. 2-valved. 6. *Heliocarpus*.

Fruit a berry.

Stigma sessile. 7. *Muntingia*.

Stigma not sessile, the style subulate. 8. *Prockia*.

1. TRIUMFETTA L.

Herbs or *shrubs*, mostly with stellate hairs. *Lvs.* often 3-5-angled or lobed, irregularly toothed, the teeth often glandular. *Fls.* yellow, clustered, axillary or opposite the leaves, sometimes forming a terminal panicle or raceme. *Sep.* 5, the apex more or less hooded and usually apiculate. *Pct.* 5, pitted at the base, or sometimes none. *Stam.* several or numerous, borne on an elongated receptacle having a saucer-shaped disk. *Ovary* 2-5-celled; *ovules* 2 in each cell; *stig.* 2-5-lobed. *Caps.* subglobose, dry, variously hairy, densely covered with prickles which are hooked at the apex, the prickles usually hispid with reflexed hairs, pilose or sometimes glabrous.

The plants of this genus are known locally by the name Cousine mahoe.

Petals present.

Prickles on fruit glabrous. 1. *T. Bartramia*.

Prickles on fruit hispid.

Lvs. with scattered mostly simple

hairs above. 2. *T. hispida*.

Lvs. woolly with stellate hairs above.

Lvs. 3-angled or lobed. 3. *T. semitriloba*.

Lvs. not lobed. 4. *T. althaeoides*.

Petals absent. 5. *T. Lappula*.

1. *T. Bartramia* L.

T. rhomboidea Jacq.

Fawc. and Rendl. Fl. Jam. 5. 81: Britt. and Wils. Sc. Surv. Porto Rico, 5. 544: Urb. Symb. Ant. 8. 407: Sprague and Hutchinson Journ. Linn. Soc. 39. 266.

Shrub about 1 m., stellate-pubescent; *lvs.* broadly ovate or rhomboid, sometimes 3-lobed, 3-9 cm. long, irregularly toothed, the teeth sometimes glandular, minute stellate hairs above, stellate woolly beneath, *petioles* slender; *fls.* mostly clustered in the upper leaf-axils; *sep.* 6-8 mm. long, narrowly oblong, hairy outside, apiculate; *pet.* oblanceolate, slightly shorter than the sepals; *stam.* about 15; *fruit* globose, 3-5 mm. diam., 2-6-celled, woolly, the prickles about 1.5 mm. long, glabrous.

Icacos, Trinidad and Tobago.

Tropics generally.

2. *T. hispida* A. Rich.

Fawc. and Rendl. Fl. Jam. 5. 83.

Shrub about 2 m. high, the stems hispid; *lvs.* more or less ovate, the apex acuminate, the older leaves lobed and up to 12 cm. long and 8.5 cm. broad, irregularly toothed, the basal teeth usually glandular, the hairs on the upper surface mostly long and simple, those beneath stellate; *stip.* lanceolate, acuminate, glabrous above, hairy beneath; *sep.* green, 5-11 mm. long, linear-oblong, apiculate, with whitish hairs outside, glabrous within; *pet.* yellow, oblong-elliptical, narrowed at the base, slightly shorter than the sepals; *stam.* about 20; *gonophore* less than 1 mm. long; the *disk* fringed; *fruit* about 5 mm. diam., somewhat woolly, 9-celled or less, the prickles hispid.

St. Ann's and Maraval, Trinidad.

Jamaica, Cuba, Isles of Pines, Hispaniola, Yucatan, Panama, Colombia, Ecuador.

3. *T. semitriloba* Jacq.

T. althaeoides Gr. Fl. 96. non Lam.

Urb. Symb. Ant. 8. 408: Fawc. and Rendl. Fl. Jam. 5. 82-83.

Under-shrub or *herb*, woody below; *lower lvs.* broadly ovate or subcordate, 3-lobed or 3-angled, the *upper lvs.* ovate to linear-oblong, irregularly toothed, generally softly stellate-tomentose on both sides; *sep.* scarcely hooded, shortly apiculate, 5-8 mm. long; *pet.* somewhat shorter than the sepals; *fruit* 4-5 mm. diam., glabrous, the prickles hispid.

Trinidad and Tobago ex Urb. We have seen no material.

Florida, Bermuda, Bahamas, West Indies, Cont. Trop. America, Mauritius.

4. *T. althaeoides* Lam.*T. macrophylla* Vahl.

Gr. Fl. 95.

Shrub up to 6 m., *stems* woolly; *lvs.* ovate to heart-shaped or roundish, the apex acuminate, not lobed, irregularly toothed, the lower teeth glandular, velvety on both sides, up to 15 cm. long and 12 cm. wide; *sep.* oblong, apiculate, about 6 mm. long; *pet.* oblong; *stam.* about 15; *stig.* 4-fid; *fruit* glabrous or puberulous, densely prickly, the prickles hispid.

Carenage and Irois, Trinidad.

Guiana and Brazil.

5. *T. Lappula* L.

Fawc. and Rendl. Fl. Jam. 5. 84: Britt. and Wils. Sc. Surv.

Porto Rico 5. 545.

Shrub up to 1.5 m. high; *lvs.* roundish or ovate, sometimes 3-5-lobed, 6-15 cm. broad, irregularly toothed, stellate velvety on both sides; *fls.* in narrow panicles; *sep.* brownish, linear-oblong, 3-4 mm. long, hairy outside; *petals* and *disk* absent; *stam.* about 10; *fruit* 3-4 mm. diam., puberulous, the prickles hispid.

Roadsides and hillsides, Trinidad and Tobago.

West Indies. Cont. Trop. America, Cape Verde Islands and Mauritius.

2. *CORCHORUS* L.

Herbs or low *shrubs* with simple or sometimes stellate hairs. *Lvs.* toothed. *Fls.* yellow, small, solitary or in few-fld. clusters, axillary or opposite the leaves, the *pedu.* short. *Sep.* and *Pel.* 5, (rarely 4). *Stam.* numerous or twice as many as the sepals, free, inserted on the receptacle. *Ovary* 2-5-celled, the *ovules* numerous in the cells. *Stig.* dilated. *Caps.* linear or oblong, many seeded, loculicidally 2-5-valved.

Lvs. with the two lowest teeth developed into bristles.

Capsule narrowly 3-winged.....1. *C. aestuans*.Capsule not winged.....2. *C. olitorius*.*Lvs.* without bristles at the base.Capsule acuminate, hairy.....3. *C. hirtus*.Capsule blunt, glabrous.....4. *C. siliquosus*.1. *C. aestuans* L.*C. acutangulus* Lam.

Gr. Fl. 97: Fawc. and Rendl. Fl. Jam. 5. 88: Britt. and

Wils. Sc. Surv. Porto Rico, 5. 542: Urb. Symb. Ant. 8. 406.

Herb, the *stems* woody; *stip.* subulate; *lvs.* ovate or roundish, the apex acute or obtuse, the base rounded, 2-10 cm. long, toothed,

the two lowest teeth terminating in a bristle, *petioles* 2 cm. long or less, hairy; *fls.* 1-3 in the axils, subsessile; *sep.* hooded, about 4 mm. long; *pet.* obovate, about 4 mm. long; *caps.* 3-celled, narrowly oblong, 1.5-3 cm. long, 3-beaked at the apex, the beaks sometimes bifid, narrowly 3-winged, glabrous; *seeds* disk-like, less than 1 mm. long.

Tobago. No Tobago specimen seen.
Tropics.

2. *C. olitorius* L. Jute.

Gr. Fl. 97: Fawc. and Rendl. Fl. Jam. 5.87: Urb. Symb. Ant. 8. 406.

Annual herb up to 3 m., *stems* usually glabrous; *lvs.* ovate-oblong, the apex acute, the base usually truncate, 7-10 cm. long, the margin toothed, the two lower teeth pointing backwards and terminating in a long bristle, glabrous; *fls.* solitary or in pairs; *sep.* 7-8 mm. long; *pet.* about the same length; *stam.* indefinite; *caps.* linear, 5-7 cm. long, with 5 short beaks at the top, 5-celled.

Jute fibre is obtained from this species and from *C. capsularis* L.

Arima, Trinidad and Tobago. No Tobago specimen seen. Doubtfully native or naturalized.

Naturalized or cultivated in most tropical countries.

3. *C. hirtus* L.

Gr. Fl. 97: Britt. and Wils. Sc. Surv. Porto Rico 5. 543: Urb. Symb. Ant. 8. 407.

Shrub, *stems* hairy, 2-5 dm. high; *lvs.* ovate, the apex obtuse or acute, the base rounded or somewhat heart-shaped, 5 cm. long or less, toothed, hirsute, *petioles* hirsute; *fls.* solitary or in pairs; *pedu.* short; *sep.* about 6 mm. long, with long weak hairs outside; *pet.* spatulate, about 6 mm. long; *caps.* linear, acuminate, 3-5 cm. long, straight or somewhat curved, hairy.

Trinidad. Eggers 5927. Thomson River, Tobago (specimen in Herb. Kew).

West Indies and South America.

4. *C. siliquosus* L.

Gr. Fl. 97: Fawc. and Rendl. Fl. Jam. 5.85: Britt. and Wils. Sc. Surv. Porto Rico 5.543: Urb. Symb. Ant. 8.406-407.

Shrub, about 1 m. high, the *branches* often with a line of hairs; *lvs.* ovate to oblong-lanceolate, acute or acuminate at the apex, rounded or obtuse at the base, the teeth equal, *petioles*

slender, hairy above; *fls.* solitary or in pairs, the *pedu.* and *pedi.* both 2-5 mm. long; *sep.* linear, acute, about 6 mm. long; *pet.* obovate, about 5 mm. long; *caps.* linear, compressed, 5-8 cm. long, the apex blunt, with 4 minute teeth, glabrous or somewhat pubescent when young, 2-celled; *seeds* about 1 mm. long.

Trinidad, no specimen seen. Eggers, 5916, Scarborough, Tobago (specimen in Herb. Kew).

Florida, West Indies and Cont. Trop. America.

3. CARPODIPTERA Griseb.

Tree. *Lvs.* entire, 5-nerved, almost glabrous. *Fls.* small, in axillary cymes or terminal panicles. *Cal.* bell-shaped, irregularly 2-3-lobed. *Pet.* 5. *Stam.* numerous, free or shortly united at the base, inserted on the receptacle; *staminodes* none. *Ovary* somewhat 2-lobed, 2-celled; *ovules* solitary in the cells, pendulous; *stig.* sessile, large, sub-petaloid, lacerate. *Caps.* subglobose, 2-valved, 4-winged. *Seeds* solitary in the cells, densely and rigidly pilose.

1. *C. floribunda* Urban.

Urb. Symb. Ant. 5.412.

Tree 13-17 m. high, the *branches* glabrous or minutely hairy at the apex, including the branches of the inflorescence; *lvs.* more or less deeply heart-shaped, the apex obtusely acuminate, 8-22 cm. long, 5-16 cm. broad, entire, glabrous, leathery; *fls.* numerous, in terminal panicles or sub-corymbs, 10-20 cm. long; *pedi.* 8-10 mm. long; *cal.* in bud ovate or narrowly ovate, bilobed, on opening 5 mm. long, shortly and densely woolly; *pet.* spatulate, wedge-shaped, 8-9 mm. long; *fil.* 1-2.5 mm. long; *caps.* 6-8 mm. diam., the wings obovate-elliptical, unequal, 25-35 mm. long, 10-16 mm. broad; *seeds* ovate, 6-6.5 mm. long.

Herb. Trin. 5848, Baptiste, Maraval, Trinidad. Herb. Trin. 806, cited by Urban is from Grenada.

St. Vincent, Grenada.

4. APEIBA Aubl.

Trees. *Lvs.* alternate, large. *Fls.* yellow or greenish, in terminal cymes or opposite the leaves. *Sep.* and *Pet.* 5, rarely 4, free. *Stam.* numerous, inserted on the receptacle; *fil.* short; *anths.* erect, linear, the connective produced above the cells. *Ovary* 8-many celled; *ovules* numerous; *style* simple; *stig.* enlarged, incurved. *Fruit* depressed globose, leathery, spiny, pulpy within. *Seeds* numerous, round or obovate, compressed.

1. **A. Tibourbou** Aubl. var. **membranacea** Lockh. Tobago
Sandbox, Mahault chardon.

Aubl. Pl. Guiana t. 213: Gr. Fl. 98 and 708.

A. Schomburgkii Szyszyl.

Tree up to 20 m.; the *twigs* shaggy; *lvs.* oblong, acuminate at the apex, heart-shaped at the base, 30 cm. long and 14 cm. broad or less, toothed, papery, minutely hairy above, densely hairy beneath, the hairs stellate, *petioles* 1-3 cm. long, shaggy; *cymes* opposite the leaves, shaggy, 2.5-4 cm. long, shaggy; *pedi.* 12 cm. long or less; *bracteoles* lanceolate, 1-1.5 cm. long; *sep.* yellow, lanceolate, 12-16 mm. long, glabrous within, densely hairy outside; *pet.* white, obovate, about 15 mm. long; *stam.* the exterior series united at the base, the appendage of the anthers pointed or notched; *ovary* 10-20-celled, styled exserted; *fruit* opening at the top, 5-7 cm. diam. including the spines which are 1-1.5 cm. long, shaggy; *seeds* about 3 mm. diam.

Hillsides and forests in dry and moist districts. Trinidad and Tobago.

St. Vincent, Trop. Cont. America.

5. SLOANEA L.

Trees. *Lvs.* alternate or subopposite, entire or toothed. *Fls.* in axillary or terminal racemes, panicles or clusters, rarely solitary. *Receptacle* thick, dilated. *Sep.* 4-5, free or barely united, valvate or rarely imbricate. *Pet.* usually absent, sometimes 1-4, imbricate. *Stam.* numerous, borne on the receptacle; *anths.* linear and apiculate or globose-oblong and blunt. *Ovary* 3-5-celled; *style* simple or 5-fid. *Caps.* woody, 4-valved, smooth or densely covered with bristles, usually 1-celled. *Seeds* usually 1, or indefinite.

Petioles glabrous.

Lvs. large; *petioles* 2-6 cm. long. 1. *S. Purdiaei*.

Lvs. small; *petioles* rarely more than

1 cm. long. 2. *S. trinitensis*.

Petioles hairy, at least above.

Stam. hairy; *anths.* linear, apiculate,
longer than the filaments. 2. *S. trinitensis*.

Stam. glabrous; *anths.* globose-oblong,
blunt, much shorter than the
filaments.

Lvs. rounded or obtuse at the apex. 3. *S. obtusa*.

Lvs. abruptly acute or acuminate and
blunt at the apex. 4. *S. trichosticha*.

1. *S. Purdiaei* Griseb. ex Benth. and Hook. fil. Gen. 2. 653, in obs. (1876).

Pouteria guianensis Griseb. Fl. not Aubl.

Sloanea sinemariensis Griseb. Fl. in part, not Aubl.

Twigs minutely pubescent; *lvs.* oblong or elliptical, the apex acute or acuminate or rounded, the base wedge-shaped, truncate or rounded, up to 23 cm. long and 8.5 cm. broad, the margin wavy, glabrous on both sides, *petioles* 2-6 cm. long, glabrous; *fls.* not seen; *fruit* in axillary racemes or clusters, few together, ellipsoidal, 1-2.8 cm. long, pubescent, thickly covered with bristles about 7 mm. long, which apparently drop, sometimes partially, sometimes completely so as to give the appearance of never having existed, *valves* splitting to the base, 1-seeded; *seeds* about 8 mm. long; *persistent sepals on fruit* lanceolate, about 2 mm. long.

Herb. Trin., Dannouse, La Brea, (1902) and 1 sheet ex herb. Grueger, no locality; Herb. Trin. 1116, no locality. Apparently endemic, Trinidad.

2. *S. trinitensis* Sandwith, sp. nov.

Twigs minutely pubescent; *lvs.* opposite, obovate or obovate-oblong, rounded at the apex, cuneate at the base, 4-8 cm. long, 2-4 cm. wide, glabrous on both sides, entire, principal veins usually 6-8 on each side of the midrib, reticulation very intricate but not very conspicuous on the lower surface; *petioles* thickened at the base and apex, very minutely pubescent when young, glabrous with age, 0.5-1.2 (commonly 1) cm. long; *infl.* axillary, very numerous, pubescent, usually 3-9 fld., up to 4 cm. long; *pedi.* opposite and terminal, 1-2.5 cm. long; *torus* pubescent, about 4 mm. diam.; *sep.* 4, free, densely pubescent-tomentellous all over on both sides, subequal, broadly ovate to triangular, 4.5-6 mm. long, 3-5 mm. wide; *stam.* 3-3.5 mm. long; *anths.* long, hairy, linear and shortly apiculate, much longer than the hairy filament; *ovary* minutely pubescent, about 1.2 mm. long and 1.5-2 mm. diam.; *style* minutely pubescent except at the 4-5 fid apex, up to 2.5 mm. long; *fruit* 2-2.5 cm. long, densely tomentellous, bristles either absent or fallen; *fruiting pedicels* 3-6 cm. long.

Superficially like *S. quadrivalvis* Seem., but immediately distinguished by the indumentum of the racemes and sepals, and by important floral characters.

Cabasterre, Oropuche, Trinidad, July, 1899, coll. J. H. Hart.
Herb. Trin. 6737 (type in Herb. Kew.)

3. *S. obtusa* (Splitg.) Schum. Mart. Fl. Bras. 12. 3. 181.*Dasyinema obtusum* Splitg.

Schum. in Mart. Fl. Bras. 12. pars. 3. 181.

Small tree, minutely pubescent; *lvs.* obovate, the apex rounded or obtuse, the base wedge-shaped, up to 16 cm. long and 8 cm. broad, glabrous except for the nerves which are pubescent on both sides, the margin wavy, *petioles* 1-3 cm. long, pubescent; *fls.* not seen on Trinidad material; (*infl.* 1 cm. long; *bracts* very small, 1-1.5 mm. long; *receptacle* 1.5-2 mm. diam.; *sep.* 4, minute, oblong-ovate, slightly woolly with ash-coloured hairs on both sides, 1-1.2 mm. long, 1 mm. broad; *stam.* 3 mm. long; *anths.* glabrous, globose-oblong, blunt; *ovary* slightly woolly, 1 mm. diam., 3-4 mm. long, including the style, ex Schum.); *fruit* in axillary, compound clusters, pubescent, thickly covered with bristles 1.5-2 cm. long, the bristles hispidulous (bristles richly coloured purplish, ex Broadway) *valves* splitting nearly to the base, 1-seeded; *seed* about 1 cm. long; persistent *sepals* on *fruit* oblong, obtuse, 2.5 mm. long.

Herb. Trin. 8474, Broadway, Jackson Trace, Chatham, Trinidad.
French and Dutch Guiana.

4. *S. trichosticha* Williams and Sandwith, sp. nov.

Twigs minutely pubescent; *lvs.* elliptical or oblong-elliptical, the apex abruptly acuminate, narrowed to the obtuse base, or sometimes rounded or even subcordate at the base, up to 18 cm. long and 7.5 cm. broad, commonly 9-12 cm. long and 4-6 cm. broad, entire, not wavy, glabrous on both sides except for the mid-rib which is puberulous beneath, *petioles* about 1.5 cm. long, puberulous and with a conspicuous line of dense hairs above; *infl.* (seen only on Jenman 4328) axillary, 1-3 cm. long, puberulous; *pedi.* 1-6 mm. long; *receptacle* hispid, about 2.5 mm. diam.; *sep.* 4, free, puberulous outside, unequal, ovate to triangular-lanceolate, 1.5-2 mm. long; *stam.* up to 3 mm. long; *anths.* small, glabrous, globose-oblong and blunt as in *S. obtusa*; *ovary* hispid, 1-1.5 mm. long and diam.; *style* glabrous, 5-fid at the apex, up to 1.5 mm. long; *fruit* (? immature) about 8 mm. long, solitary to few in the axis, pubescent, densely covered with dark-coloured, slender bristles, the bristles strongly hispidulous; persistent *sepals* on *fruit* oblong-lanceolate, about 1 mm. long.

This has been confused with *S. guianensis* (Aubl.) Benth., which bears very little resemblance to it and is easily distinguished by the petiole which does not bear a line of hairs, by the large

persistent sepals, the longer, very stiff, straw-coloured bristles of the fruit, and the apiculate anthers.

Herb. Trin., 646, without locality (type); Herb. Trin. 2816, Guanapo, Oct., 1859, coll. Crueger, Trinidad.

Br. Guiana: Lower Demerara River, Dec., 1887, Jenman 4328, (Herb. Kew); without locality as "Guiana Belgica", Alex Anderson (Herb. Brit. Mus.). Anderson collected in Demerara before the Colony was ceded to Britain. Vernacular Name, 'Maharacaballi.' (vide Jenman.)

6. HELIOCARPUS L.

Trees or shrubs with stellate hairs. *Lvs.* 3-lobed, toothed. *Fls.* small, in terminal cymes or panicles. *Sep.* 4, free. *Pet.* 4. *Stam.* numerous, free, inserted on the receptacle. *Ovary* 2-celled; *ovules* 2 in each cell; *styles* threadlike; *stig.* bifid. *Caps.* stalked, somewhat compressed, with plume rays on the margin, 2-celled. *Seeds* pendulous, one in each cell.

1. *H. trichopodus* Turcz.

Small tree; *lvs.* heart-shaped, mostly acute, 14 cm. long, and 12 cm. broad or less, irregularly toothed, minutely stellate-pubescent above, densely stellate-pubescent and with long spreading hairs on the nerves beneath, *petioles* 2-2.5 cm. long, pubescent; *fls.* in spreading densely hairy panicles; *sep.* oblong, acute, 3.5 mm. long, pubescent outside; *pet.* linear-oblong to spathulate, 3 mm. long; *stam.* about 16, 2-3 mm. long; *ovary* pubescent; *style* 1.25 mm. long; *fruit* ovoid, about 3 mm. long with a fringe of stiff hairs or bristles about 5 mm. long, the bristles covered with shaggy hairs.

This species has been wrongly placed by some authors under the very distinct *H. popayanensis* H.B.K.; it is far more closely allied to Vahl's *Triumfetta hirta*, of which there is a specimen at the British Museum, and differs in details which may prove of insufficient importance. *Heliocarpus hirtus* (Vahl.) Williams et Sandwith comb. nov., *Triumfetta hirta* Vahl. Symb. Bot. 3. 63 (1794). *H. popayanensis* sensu stricto from Popayan is immediately distinguished from both *H. trichopodus* and *H. hirtus* by the peculiar floccose indumentum of the branches of the inflorescence, and by the surface of the fruit which is more or less covered with small bristles.

Herb. Trin. 649, Santa Cruz, 650 no locality and 9200 Lady Chancellor Road, Trinidad.

Venezuela and Colombia.

7. MUNTINGIA L.

Small tree with stellate hairs. *Lvs.* alternate, simple, toothed, with *stipules*. *Fls.* white, solitary, borne 2 or 3 together in the axils or above the axils. *Sep.* and *Pet.* usually 5, rarely 6-7. *Stam.* numerous, free, inserted on the cup-like disk. *Ovary* surrounded by a ring of hairs at the base, usually 5-celled, or 6 or 7-celled; *ovules* densely numerous in the cells. *Stig.* sessile, thick, lobed. *Fruit* a globose berry. *Seeds* minute, very numerous, enclosed in pulp attached to placentas which divide the cells irregularly.

1. *M. Calabura* L.

Gr. Fl. 98: Fawc. and Rendl. Fl. Jam. 5.89.

Tree up to about 13 m. or sometimes shrubby, the young branches densely covered with shaggy hairs sometimes mixed with glandular hairs; *lvs.* oblong or oblong-lanceolate, the apex acuminate, the base unequal, semi-heart-shaped, 4-11 cm. long, 1-3 cm. broad, velvety to puberulous above, densely hoary felty beneath, irregularly toothed, *petioles* 2-6 mm. long, woolly; *stip.* linear, woolly, longer than the *petioles*; *pedu.* 1-3 cm. long, woolly and shaggy; *sep.* lanceolate, the apex threadlike, 8-12 mm. long, woolly; *pet.* obovate, about as long as the *sepals*; *stam.* 4-6 mm. long; *berry* red, 8-12 mm. diam., crowned by the persistent lobed stigma and with a ring of hairs surrounding it at the base.

Griseb. loc. cit. describes a variety *trinilensis* which he distinguished as "branches villous not glandular."

Monos and Chacachacare, Trinidad. Friendship, Tobago.

Cuba, Isle of Pines, Hispaniola, St. Vincent. Trop. Cont. America.

8. PROCKIA L.

Shrubs. *Lvs.* ovate, toothed, palmately nerved from the base. *Fls.* in terminal clusters, short racemes or corymbs. *Sep.* 3-4, valvate, persistent. *Pet.* as many as the *sepals* or less, and shorter. *Stam.* numerous, free, inserted on a small disk; *anths.* small, subglobose. *Ovary* 3-5 celled; *ovules* numerous; *style* subulate, entire. *Fruit* a berry. *Seeds* small, numerous.

1. *P. crucis* L.

Urb. Symb. Ant. 4.417: Britt. and Wils. Sc. Surv. Porto Rico 5.590.

Small tree up to 10 m., *twigs* slender, glabrous or pubescent; *lvs.* broadly ovate, the apex acuminate, the base heart-shaped, 3-12 cm. long, glabrous or pubescent, *petioles* slender, 2 cm. long or less; *racemes* or *corymbs* as long as the leaves or shorter; *fls.* scented; *pedi.* 1-3 cm. long; *sep.* ovate or ovate-lanceolate, about 5 mm. long, puberulous; *pet.* yellowish; *berry* black, globose, 6-9 mm. diam.; *seeds* 1 mm. diam.

Broadway, 5973, Cradley Riverside, Tobago.

West Indies, Central America and Trop. S. America.

COHORT 7. GERANIALES.

BY

R. O. WILLIAMS.*

Herbs or sub-shrubs.

Lvs. compound.

Lvs. alternate, sometimes all basal
in *Ovalis*.....

1. Oxalidaceae.

Lvs. opposite, sometimes one of
the pair wanting.....

2. Zygophyllaceae.

Lvs. simple.....

3. Ochnaceae.

Shrubs, climbing shrubs or trees.

Lvs. simple. (See also *Bursera trinitensis*.)

Stip. present.

Pet. with an appendage within....

4. Erythroxylaceae.

Pet. without an appendage within.

Infl. joined to the petiole....

5. Dichapetalaceae.

Infl. not joined to the petiole.

Sep. united below, usually

with glands outside.....

6. Malpighiaceae.

Sep. free, not glandular.....

3. Ochnaceae.

Stip. none.

Lvs. with glandular transparent
dots.....

7. Rutaceae.

Lvs. without glandular trans-
parent dotsPet. clawed, fringed, toothed
or lobed.....

6. Malpighiaceae.

Pet. not clawed, entire.

8. Humiriaceae.

Lvs. compound. (Simple in *Bursera*
trinitensis.)

Stip. present.....

2. Zygophyllaceae.

Stip. none.

Fil. free or barely united at the base.

Trees yielding balsam-like resin.

9. Burseraceae.

Trees not resinous.

Lvs. with glandular trans-
parent dots.....

7. Rutaceae.

Lvs. without glandular trans-
parent dots.....

10. Simaroubaceae.

Fil. more or less united into a
tube or joined to the columnar

disk.....

11. Meliaceae.

*The manuscript was critically read by Mr. N. Y. Sandwith of Kew to whom the writer hereby gratefully acknowledges considerable help in its revision especially as regards that of the Malpighiaceae.

FAMILY 1. OXALIDACEAE.

Herbs or sub-shrubs. Lvs. alternate, palmately or pinnately compound. *Stip.* free, joined to the petiole or wanting. *Fls.* hermaphrodite, solitary or in simple or compound cymes at the top of the peduncle. *Sep.* 5, imbricate. *Pet.* 5, free or shortly united at the base, twisted in the bud. *Stam.* 10, united at the base in two series, those of the longer series sometimes with an appendage on the back of the filaments; *anths.* 2-celled, longitudinally dehiscent. *Ovary* 5-celled, superior; *styles* 5, free, persistent; sometimes trimorphic, *viz.*: shorter than the short series of stamens, intermediate in length between both series, or exceeding the longer stamens; *stig.* capitate or minutely divided. *Ovules* 1 to numerous, attached to the inner angle of the cells. *Fruit* (in the local spp.) a 5-celled capsule.

- Lvs. with 1-3 leaflets 1. *Oxalis*.
 Lvs. with many leaflets 2. *Biophytum*.

1. OXALIS L.

Herbs or sub-shrubs either with a scaly rootstock without stems or with creeping or erect stems. *Lvs.* arising from the rootstock or from the stems, palmately or pinnately 3-lobed. *Fls.* yellow, white, pink or purple. *Caps.* with each valve bursting longitudinally. *Seeds* transversely wrinkled.

Herbs stemless.

Styles pubescent 1. *O. corymbosa*.

Styles glabrous 2. *O. intermedia*.

Herbs with creeping stems 3. *O. corniculata*.

Herbs or sub-shrubs with erect stems.

Fls. yellow, stems woody 4. *O. sepium*.

Fls. pink, stems not woody or only
 so below 5. *O. Barrelieri*.

1. *O. corymbosa* DC.

O. Martiana Zucc.

Stemless herb 1-3 dm. high with a scaly bulb, *scales* ovate-oblong, about 7 mm. long, with 3 orange coloured lines outside; *lvs.* digitately 3-lobed, the leaflets sub-orbicular or broadly obcordate, notched at the apex, 2-5 mm. broad, the margin fringed pubescent, and with glandular dots beneath, *petioles* 1-2 dm. long with long spreading weak hairs; *fls.* about 2 cm. diameter, in compound cymes longer than the leaves; *sep.* lanceolate-oblong, about 5 mm. long, with 2 yellow glands at the apex;

pet. reddish-mauve, lined at the base, obovate-oblong, 15 mm. long; *stam.* the longer 6 mm. long, pubescent, not appendaged; *styles* pubescent; *stig.* green.

Herb. Trin. 11944. A troublesome weed in some gardens in Trinidad.

Florida, Mexico, West Indies, Northern South America.

2. *O. intermedia* A. Rich.

N. Amer. Fl. 25.43.

Stemless herb 1-3 dm. high, with a scaly bulb, *scales* ovate-oblong, acute, about 7 mm. long, with 3 orange coloured lines outside; *lvs.* palmately 3-lobed, leaflets broadly triangular, notched at the apex, rounded on the angles, 2-6 cm. broad, glabrous above, and with a few scattered hairs beneath, *petioles* puberulous; *fls.* 13 mm. diam. in simple umbels exceeding the leaves; *pedi.* 1-2 cm. long, glabrous; *sep.* ovate to oblong, 4-5 mm. long, green, glabrous, with 2 yellow glands at the apex; *pet.* reddish-mauve yellowish-green at the base, obovate, rounded at the apex, about 1 cm. long; *fil.* the longest about 6 mm. long, swollen outside, near the base, pubescent with spreading hairs, shorter filaments pubescent; *styles* glabrous.

Herb. Trin. 11940. A weed in gardens, Trinidad.
West Indies.

3. *O. corniculata* L.

Xanthoxalis corniculata Small.

O. trinidadensis Knuth in Fedde. Repert. Spec. Nov. 23. 279 (1927): Urb. Symb. Ant. 8.315: N. Amer. Fl. 25.52: Fawc. and Rendl. Fl. Jam. 4. 156.

Stems creeping, rooting at the joints, pubescent; *lfts.* broadly obcordate, notched at the apex, 3-18 mm. broad, glabrous or with scattered hairs on both sides, the margin fringed, *petioles* puberulous, 2-4 cm. long; *cymes* axillary, 1-4 flowered; *fls.* 6 mm. diam.; *pedu.* puberulous, up to 4 cm. long; *sep.* linear, 3-4 mm. long, puberulous, sometimes minutely bearded; *pet.* yellow, obovate, 4-5 mm. long; *fil.* glabrous, 3 mm. long, not appendaged; *style* pubescent, erect; *caps.* linear-oblong, the apex acute, pubescent; *seeds* transversely ridged, brown.

O. trinidadensis Knuth. on critical examination proved to be only a small form of *O. corniculata* L.

Moist banks, waste and cultivated ground, Trinidad.
Tropical and temperate countries.

4. *O. sepium* St. Hil.*Lotoxalis sepium* Small.

N. Amer. Fl. 25.48.

Herb or *sub-shrub* 5 dm. high, the *stems* woody, puberulous when young; *lvs.* up to 8 cm. long including the petiole, *lfts.* ovate to ovate-oblong, obtuse at the apex, the terminal one 1-3 cm. long, the lateral smaller, glabrous above, very minutely pubescent beneath; *fls.* in dichotomous cymes 2-4 cm. long; *pedi.* 2-4 mm. long, glabrous or nearly so; *sep.* about 3 mm. long, nearly glabrous, lanceolate, the outer broader than the inner; *pet.* yellow, 7-8 mm. long; *fil.* the long ones about 3 mm. long, appendaged at about the middle and very minutely pubescent above; *styles* pubescent, 2.5 mm. long; *caps.* subglobose, about 5 mm. long, tipped with the persistent awl-shaped stigmas.

Herb. Trin. 11943, a weed in the Botanic Gardens, is possibly a trimorphic form of this species. On this specimen the *stems* and *inflorescence* are pubescent, with long and short spreading hairs, and the sexual organs are of three forms, viz.:—(a) short *stam.* 2 mm.; longer *stam.* 3.5 mm.; *styles* 1 mm., recurved from the base, glabrous; (b) short *stam.* barely 1 mm.; longer *stam.* 3.5 mm.; *styles* 2 mm., erect or slightly recurved at the tips; glabrous or very minutely puberulous; (c) short *stam.* 1 mm., longer *stam.* 2.25 mm.; *styles* 3.25 mm., erect, glabrous, or very minutely puberulous.

Herb. Trin. Nos. 11406, 11099, 11665 and 11810. Grassy places; Trinidad and Tobago.

Mexico to Brazil. West Indies.

5. *O. Barrelieri* L.*Lotoxalis Barrelieri* Small.

Urb. Symb. Ant. 8.315; N. Amer. Fl. 25.49.

Annual up to 4.5 dm. high, the *stems* puberulous; *lvs.* somewhat distant from each other; *lfts.* ovate, ovate-oblong, obtuse or acute at the apex, 1.5-4.5 cm. long, the terminal leaflet much larger than the lateral ones, glabrous above or nearly so, sparsely hairy beneath; *fls.* 7 mm. diam. in dichotomous cymes borne above the leaves; *sep.* glabrous or nearly so, 3-4 mm. long, the outer oblong-lanceolate; *pet.* pale pink, yellow at the base, obovate-oblong, truncate at the apex, 6 mm. long; *stam.* the longer filaments with an appendage at about the middle, minutely pubescent above; *styles* minutely pubescent in the upper part; *stig.* green capitate, minutely 2-lobed; *caps.* obovoid-oblong, the apex acute 5-angled, glabrous or nearly so.

In dry places, Trinidad and Tobago.

West Indies and Northern S. America.

2. BIOPHYTUM DC.

Annual plants. Lvs. clustered at the tops of the stems, abruptly pinnate, with many pairs of opposite, unequal leaflets. *Fls.* in congested umbels at the ends of the pedu. *Sep.* 5, the inner ones narrower than the outer. *Pets.* 5, obovate to wedge-shaped. *Stam.* 10, 5 long and 5 short, alternating. *Styles* 5, distinct, minutely bifid at the apex. *Caps.* ovate-globose, 5 valved, the valves radiate on dehiscence separating from the column and from each other at the top. *Seeds* warty.

1. *B. Reinwardtii* Edgew. and Hook. fil.

Plant erect, 5-20 cm. high; *lvs.* sensitive to the touch, 2-7 cm. long including the short petiole, with about 10-14 pairs of oblong leaflets, the pairs increasing in size from the base to the apex, puberulous especially on the mid rib above; *pedu.* erect, 7.5 cm. long or less; *fls.* 7 mm. diam.; *pedi.* about 3-5 mm. long; *sep.* green, linear to lanceolate, glandular outside; *pet.* united below, yellow with a brownish line in the centre, truncate, 7 mm long, glabrous; *stam.* 5 long, 4 mm. long, 5 short 1 mm. long, all glabrous; *ovary* 5-lobed; *styles* 1.5 mm. long, glabrous or nearly so; *caps.* 5 mm. diam. after dehiscence; *seeds* brown, warty.

Herb. Trin. 11939, Williams, St. Ann's, Trinidad. Naturalized.

India, Ceylon, Andaman Islands, Java, China and Philippine Islands.

FAMILY 2. ZYGOPHYLLACEAE.

Herbs, shrubs or rarely trees, the branches often jointed at the nodes. *Lvs.* opposite or alternate, pinnate; *lfts.* entire; *stip.* in pairs, persistent. *Fls.* hermaphrodite. *Sep.* 5, rarely 4-6, free or rarely united at the base, imbricate. *Pet.* 5, rarely 4-6, free, imbricate. *Stam.* twice as many as the petals, distinct; *anths.* 2-celled, opening lengthwise. *Ovary* superior, usually 4-5 celled; *style* simple, or *stigmas* sessile; *ovules* 2-numerous, pendulous or ascending. *Fruit* of 2-12 cocci, variously angled, separating when ripe; *cocci* 1 or few seeded.

Shrubs or small trees 1. *Guaiacum*.

Herbs 2. *Kallstroemia*.

1. GUAIACUM L.

Trees or shrubs with extremely hard resinous wood; the branches often with swollen nodes. *Lvs.* opposite, abruptly pinnate, *lfts.* in 2-14 pairs, unequal. *Stip.* minute. *Pedu.* 1-flowered, solitary or clustered, with minute deciduous bracts at

the base. *Sep.* unequal. *Pet.* blue or purple, obovate. *Ovary* shortly stalked, 2-5-lobed and 2-5 celled; *style* awl-shaped; *stig.* entire or 2-5 toothed. *Ovules* 8-10 in each cell, pendulous. *Fruit* smooth, somewhat fleshy outside, of 2-5 cocci; *cocci* angled or winged on the back, separating when ripe. *Seeds* solitary in the cells.

1. *G. officinale* L. Lignum Vitae.

Gr. Fl. 134: Fawc. and Rendl. Fl. Jam. 4.163: Kew Bull. 1924, 279: Urb. Symb. Ant. 8.318.

Small evergreen tree, 3-10 mm. high with crowded branches; *lvs.* with 2-3 pairs of leaflets, the latter sessile, usually elliptical or obovate-elliptical, rounded at the apex, obtuse at the base, 1-5 cm. long, 1-2.5 cm. broad, somewhat unequal and leathery, glabrous, the veins prominent on both sides; *stip.* about 1 mm. long, puberulous, falling early; *fls.* usually in axillary clusters at the tops of the branches, the *pedu.* pubescent; *sep.* 5, whitish-woolly on both sides, 4-6 mm. long; *pet.* 5, blue changing to white, obovate, 12-15 mm. long, puberulous at the apex, sometimes on both sides; *stam.* 10, 7-10 mm. long; *fil.* blue; *ovary* compressed; *style* 3 mm. long; *fruit* usually 2-celled, orange, about 2 cm. long, compressed, somewhat obcordate, with a persistent pointed style; *seeds* ellipsoidal, about 12 mm. long.

The brownish green heart wood is extremely hard and tough and is used for pulley-blocks, balls for bowls, pestles and mortars, &c. The tree yields a resin of medicinal value as a local stimulant and for gout and rheumatism. Record and Mell in, *Timbers of Tropical America* state:—

"The most important as well as the most exacting use for lignum-vitae is for bearings or bushing-blocks; for lining the stern tubes of propeller shafts of steamships. The great strength and tenacity of the wood, combined with the self-lubricating properties due to the resin content, make this wood especially adapted for bearings under water. Other uses are mallets, pulley sheaves, caster wheels, bowling balls, mast-head trucks, stencil and chisel blocks, and turned novelties; it is used to a limited extent for brush backs."

Herb. Trin. 10711, Williams, Patos: Lockhart, Trinidad. 3664.
Broadway, Plymouth, Tobago ("A cultivated tree").
West Indies, Northern South America.

2. KALLSTROEMIA Scop.

Diffuse and branching *herbs*, with ascending or procumbent stems. *Lvs.* abruptly pinnate the opposite one of each pair either smaller than the other or wanting. *Stip.* awl-shaped. *Fls.* solitary in the axils. *Pedu.* stouter at the top. *Sep.* 5 or 6, persistent. *Pet.* 4-6, obovate. *Stam.* 10 or 12, those opposite the petals more or less united to their base, the alternate stamens smaller with a stalked gland at the base outside. *Ovary* sessile, 8-12 celled; *ovules* one in each cell, pendulous; *stig.* capitate. *Fruit* of 1-2 cocci, separating when ripe leaving a thick central axis; *cocci* 1-seeded, warty. *Seeds* obovate.

1. *K. caribaea* Rydberg.

N. Amer. Fl. 25.III.

Low somewhat procumbent *herb*, 3-5 dm. long, sparingly hairy; *lvs.* 3-5 cm. long, usually composed of 3 pairs of leaflets; *lfts.* unequal, elliptical, oblong or obovate, rounded or minutely pointed at the apex, the base rounded often only on one side, 10-22 mm. long, sparsely adpressed pubescent on both sides; *pedu.* 1-3 cm. long; *sep.* linear-lanceolate, 5-6 mm. long, with long, white, stiffish hairs; *pet.* pale yellow, obovate, truncate at the apex, 6-7 mm. long; *stam.* 10; *stig.* green; *fruit* pyramidal, about 5 mm. diam., beaked with the persistent style, covered with stiffish greyish hairs, *beak* 2-3 mm. long.

Scarborough and Sandy Point, Tobago.

Lesser Antilles, Costa Rica, Honduras, Colombia and Venezuela.

FAMILY 3. OCHNACEAE.

Herbs, shrubs or trees. *Lvs.* alternate, simple, stipulate. *Fls.* hermaphrodite, usually in terminal racemes or panicles. *Sep.* 4-5, rarely 10, free, imbricate. *Pet.* 5, rarely 4-10 free, imbricate or contorted. *Stam.* 4, 5, 8, 10 or numerous, with or without staminodes; *anths.* linear, opening longitudinally or by a terminal pore. *Ovary* entire or deeply lobed, 1-10-celled; *style*, simple, rarely lobed at the apex. *Ovules* 1 to numerous, ascending or rarely pendulous. *Fruit* various. *Seeds* solitary, few or numerous.

Shrubs or trees; stip. entire.....1. *Ouratea*.

Herbs or sub-shrubs stip. conspicuously
fringed2. *Sauvagesia*.

1. OURATEA Aubl.

Shrubs or trees, glabrous. Lvs. persistent, leathery, shining, usually with numerous sharp teeth on the margin. Stip. free in the local spp. Panicles or racemes terminal, or terminal and axillary. Fls. yellow. Pedi. with a scarious bract and 2 bracteoles at the base, these either deciduous before flowering or persistent and conspicuous until the fruit forms. Sep. 5, usually coloured, imbricate. Pet. 5, imbricate, obovate, clawed. Receptacle thick and elongated. Stam. 10, inserted at the base of the receptacle; fil. very short; anths. opening by pores at the apex. Ovary 5-6 lobed, the lobes inserted obliquely on the disc; styles united; stig. simple. Ovules solitary in each cell, ascending. Drupes 5 or less, on the enlarged receptacle.

- Panicle pubescent; bracts and bracteoles deciduous.....1. *O. Guildingi*.
 Panicles glabrous, bracts and bracteoles conspicuous and persistent during flowering.....2. *O. Purdieana*.

1. *O. Guildingi* (Planch.) Urb.

Gomphia pyrifolia Griseb. Fl. 105.

Urb. Symb. Ant. 1. 364.

Tree 3-10 m. with stubby branches; lvs. lanceolate or elliptical-oblong, tapering at both ends, or sometimes rounded at the apex, 4-9 cm. long, 1.5-3.5 cm. broad, the margin minutely spiny-toothed, petioles 2-4 mm. long; stip. lanceolate to awl-shaped, 3-5 mm. long; fls. primrose-scented, 1.5 cm. diam., in short terminal pubescent panicles about 5-6 cm. long, often terminating very short lateral branchlets, so as to appear axillary; bracts and bracteoles deciduous; sep. 5, ovate-elliptical, 5-6 mm. long; pet. 5, yellow, broadly spatulate or wedge-shaped, irregularly notched, about 7 mm. long; stam. 3.5-4 mm. long; ovary deeply 5-lobed; drupe shortly obovate, inserted upon an obconical fleshy receptacle; receptacle red, about 6 mm. long.

Chacachacare, Monos, N. W. Point and Gasparillo, Trinidad; 5337, Broadway, Rockley Vale, near Scarborough, Tobago. West Indies and Venezuela.

2. *O. Purdieana* van Tiegh.

O. nitida Engl. in Mart. Fl. Bras. 12.2.310 ex parte: *Gomphia nitida* of Gr. Fl. 105.

Lvs. lanceolate or lanceolate-oblong, the apex acute or acuminate, the base wedge-shaped or rounded, 10-25 cm. long, 3.5-8 cm. broad, the margin coarsely spinous toothed, the nerves

conspicuously sculptured on the lower surface, *petioles* about 1 cm. long; *fls.* in large, terminal, glabrous panicles; *bracts* and *bracteoles* conspicuous and persistent during flowering, *bracts* 3-4 mm. long, *bracteoles* shorter, usually 2-3 mm.; *sep.* ovate-lanceolate, acuminate, 5-7 mm. long, persistent, erect; *drupes* ovoid or ellipsoid, tapered at the base, borne separate on the fleshy depressed globose receptacle; *receptacle* in fruit 6-12 mm. diam. and 4-7 mm. long.

Very closely allied to *O. Hilaircana* van Tiegh. and *O. castaneifolia* (DC.) Engl. of S. America and differing mainly in characters of the leaf venation.

Herb, Trin. 3102, Road to Maracas and 6739, Dannouse, Tucuche. Apparently endemic, Trinidad.

DOUBTFUL SPECIES.

O. Finlayi (van Tiegh.) Urb.

Trinidad ex Urb. Symb. Ant. 5. 430. Otherwise unknown from Trinidad. Imperfectly described.

2. SAUVAGESIA L.

Herbs or *subshrubs*, glabrous. *Lvs.* rigid, entire or toothed. *Stip.* fringed. *Fls.* axillary or in terminal racemes. *Sep.* equal or unequal. *Pet.* equal, convolute. *Staminodes* in two series, the outer either 5 alternate with the petals or numerous, thread-like, the inner 5 petaloid, opposite the petals and enclosing the stamens and ovary. *Stam.* with very short filaments, alternate with the inner staminodes; *anths.* linear, laterally dehiscent. *Ovary* 1-celled with 3 placentas; *style* simple; *stigma* obtuse. *Caps.* septicidally 3-valved. *Seeds* numerous, minute.

Fls. axillary. *Sep.* lanceolate, acuminate,
of equal length.....1. *S. erecta*.

Fls. in a distinct terminal raceme. *Sep.*
ovate-lanceolate, obtuse or acute, of
unequal length2. *S. Sprengelii*.

1. *S. erecta* L.

Gr. Fl. 112: Britt. and Wils. Sc. Surv. Porto Rico 5.578.

Low herb, stems erect or procumbent; *lvs.* lanceolate, elliptical or oblong-lanceolate, the apex acute, the base wedge-shaped, 1-3.5 cm. long, 3-10 mm. broad, the margin toothed, sessile or

shortly petioled; *stip.* lanceolate, 5-6 mm. long, fringed with long weak hairs; *fls.* usually solitary or 2 together in the axils of the leaves; *pedi.* 5-10 mm. long; *sep.* lanceolate, acuminate, bristle-like at the apex, about 6 mm. long; *pet.* rose-purple, obovate, 5-6 mm. long, 3-4 mm. broad; *staminodes* of the outer series numerous; *petaloid staminodes* 3.5 mm. long, oblong, obtuse; *anth.* 1.5 mm. long; *style* 2 mm. long; *caps.* about 6 mm. long; *seeds* minutely pitted.

Savannahs and grassy places, Trinidad.
West Indies and Continental Trop. America.

2. *S. Sprengelii* St. Hil.

Low herb, stems erect or somewhat procumbent; *lvs.* lanceolate, narrowed at both ends, 2-10 mm. long, 0.5-1.5 mm. broad, the margin slightly toothed; *stip.* linear, 2-3 mm. long, fringed with long weak hairs; *fls.* in terminal racemes; *sep.* unequal, ovate-lanceolate, obtuse or acute with a minute bristle at the apex, 3.5-4.5 mm. long; *pet.* obovate, about 5 mm. long; *staminodes* of the outer series numerous, *petaloid staminodes* 3.5 mm. long, obtuse at the apex; *anths.* 1.5 mm. long; *style* 2 mm. long; *caps.* acuminate, 5 mm. long; *seeds* minutely pitted.

Aripo and Piarco Savannahs, Trinidad.
Venezuela to South Brazil.

FAMILY 4. ERYTHROXYLACEAE.

Shrubs or *trees*, glabrous. *Lvs.* alternate, rarely opposite, simple, entire. *Stip.* often imbricate on the young shoots. *Fls.* white, small, regular, often heterostyled, solitary or in axillary clusters. *Cal.* persistent, 5-lobed, imbricate. *Pet.* 5, free, deciduous, usually with a 2-lobed ligule on the inside. *Stam.* 10, in 2 series, united below into a cup; *anths.* ellipsoidal, 2-celled, longitudinally dehiscent. *Ovary* 3-celled; *ovules* 1, rarely 2 in each cell, pendulous; *styles* 3, usually distinct; *stigmas* capitate. *Fruit* a drupe, usually 1-celled and 1-seeded.

ERYTHROXYLUM P. Br.

Shrubs or trees. *Lvs.* alternate. *Cal.* lobes triangular. *Ped.* short clawed with a ligule inside. *Drupe* 1-celled and 1-seeded.

The plants in this genus are known locally as wild Cocaine or Iron Wood.

Lvs. with two distinct parallel lines beneath.

Lvs. thin, less than 5 cm. long and 2.5 cm.

broad 1. *E. novogranatense*.

Lvs. thick, 6.8 cm. long and 2.5-4.5 cm.

broad 2. *E. carthagenense*.

Lvs. without parallel lines beneath.

Stip. large (6-15 mm. long) with prominent longitudinal lines.

Fls. in clusters of 10-25. *Lvs.* coarsely reticulate veined 3. *E. amplum*.

Fls. in clusters of 3-9. *Lvs.* not coarsely reticulate veined 4. *E. amazonicum*.

Stip. small without prominent longitudinal lines.

Lvs. abruptly acuminate at the apex 5. *E. squamatum*.

Lvs. obtuse, acute or rounded at the apex.

Lvs. reddish beneath, the margin revolute 6. *E. impressum*.

Lvs. grey or pale green beneath the margin not revolute 7. *E. ovatum*.

1. ***E. novo granatense*** (Morris) Hieron.

E. coca var. *novogranatense* Morris.

Urb. Symb. Ant. 5. 199-200.

Shrub 1-3 m. *Lvs.* narrowly elliptical, rounded or slightly retuse and mucronate at the apex, acute at the base, 3-4.8 cm. long, 1.5-2 cm. broad, thin, with 2 distinct parallel lines beneath; *petiole* 3-6 mm. long; *stip.* triangular, persistent, 1.5-3 mm. long; *fls.* 3-15 in the axils of the leaves; *pedi.* 4.5-7.5 mm. long; *cal.* about 1.5 mm. long, the lobes broadly lanceolate; *pet.* oblong, 4-6 mm. long; *drupe* red, obovate, obtuse, 6-10 mm. long, 4.5-6.5 mm. diam.

This species is not wild in Trinidad, but cultivated.

Var. *b. tobagense* O.E. Schulz.

Lvs. shortly ovate, 25-32 mm. long, 18-22 mm. broad, the 2 parallel lines hardly visible on the lower surface, yet definitely present; *fls.* 1-3 in the axils; *pedi.* 3-3.5 mm. long.

Eggers, 5831, Morne d'Or, Tobago. Spontaneous as well as cultivated.

Colombia and Venezuela.

2. *E. carthagenense* Jacq.

E. obtusum Griseb. Fl. 114. not DC.; *E. areolatum* in Herb. List p. 8, Trinidad: Urb. Symb. Ant. 5. 201-202.

Small tree up to 5 m.; *lvs.* obovate, the apex rounded or slightly notched, the base more or less acute, 5-8 cm. long, 3-4.6 cm. broad, somewhat rusty-coloured and distinctly glaucous beneath, and with two distinct lines parallel with the mid-rib beneath, somewhat leathery; *petiole* 3-5 mm. long; *stip.* persistent, 1-1.5 mm. long, thick, triangular; *fls.* in clusters of 3-6; *pedi.* 1.5-2.5 mm. long, thick; *cal.* nearly 2 mm. long, divided to about the middle; *pet.* oblong, 3.8-4.5 mm. long, the ligule about half as long; *drupe* ellipsoidal, 10-11 mm. long, 4-4.5 mm. diam., grooved.

181. Crueger and Herb. Trin. 1036, no locality. Fendler. 493, in Herb. Kew. Trinidad, Colombia.

3. *E. amplum* Benth.

N. Amer. Fl. 25.65.

Shrub; *lvs.* oblong-elliptical, the apex acuminate, the base narrowed or somewhat rounded, 15-30 cm. long, 4-10 cm. wide, coarsely veined; *petioles* 6-12 mm. long; *stip.* triangular-lanceolate; acuminate, with prominent lines about as long as the petioles; *fls.* in clusters of 10-25; *pedi.* about 2 mm. long; *cal.* 1.5-2 mm. long, deeply divided, the lobes ovate, acute; *pet.* oblong, 4-5 mm. long, the ligule about half as long.

Not seen. Forests in wet districts, ex Britton Hand List of Trinidad Flora, ined.

Panama to Northern Brazil.

4. *E. amazonicum* Peyritsch.

Urb. Symb. Ant. 5. 190.

A slender tree up to 7.5 m. high; *lvs.* obovate, oblong-obovate; or oblong-elliptical, acute or shortly acuminate at the apex, wedge-shaped at the base, up to 12 cm. long and 6 cm. broad, brownish, with the lateral nerves barely prominent beneath, leathery; *stip.* lanceolate, 6-15 mm. long, with prominent longitudinal lines, the apex obtuse and terminated by 3 bristles about 2 mm. long, persistent or tardily deciduous; *fls.* in clusters of 3-9; *pedi.* 1.5-5 mm. long, thickened towards the apex; *cal.* 1-2 mm. long, deeply lobed; *pet.* oblong, 3-4 mm. long, the ligule nearly half as long; *drupe* oblong, obtuse, 12-16 mm. long, 5.5-6 mm. diam.

Herb. Trin. 5873, Baptiste, Maraval and 8897, Dannouse, Guapo, Trinidad.

Guiana, Brazil.

5. *E. squamatum* Sw.

Urb. Symb. Ant. 5. 191-192 : N. Amer. Fl. 25.60.

Shrub or *tree*; *lvs.* elliptical, elliptical-oblong, or obovate-oblong, abruptly acuminate at the apex, more or less narrowed at the base, up to 15 cm. long and 6 cm. broad, somewhat leathery, the mid-rib and lateral veins prominent beneath; *petioles* 4-7 mm. long; *stip.* triangular, acute, 2-4 mm. long, persistent and crowded on the twigs; *pedi.* slender, angled, 6-10 mm. long, slightly increasing on the fruit; *cal.* 1.5 mm. long, divided to about the middle, the lobes ovate, acute; *pet.* oblong, obtuse, 5-5.5 mm. long, the ligule about one-third as long as the blade; *drupe* oblong, blunt, 10-15 mm. long and 4-6 mm. diam.

Tucuche and Arima, Trinidad.
West Indies, Guiana.

6. *E. impressum* O.E. Schulz.

Urb. Symb. Ant. 5. 202.

Shrub or small *tree*; *lvs.* elliptical, the apex obtuse or with a minute point, the base wedge-shaped, 4-6 cm. long, 2-4 cm. broad; papery, rusty beneath, the margin revolute, *petioles* 4 mm. long; *stip.* triangular, persistent, 1.5-2 mm. long; *fls.* axillary in clusters of 2-5; *pedi.* 3-4.5 mm. long; *cal.* divided to about the middle, the segments about 1 mm. long, narrowly triangular acute; *pet.* oblong, ligulate, 3-3.5 mm. long; *staminal cup* shorter than the calyx; *drupe* ovoid, acute, 6.5 mm. long, 3.5 mm. diam.

Herb. Trin. 917 and 1798 Crueger, Gasparillo, Trinidad.
Venezuela.

7. *E. ovatum* Cav.

Urb. Symb. Ant. 5. 207-208 : N. Amer. Fl. 25.65.

Shrub or small *tree* up to 9 m; *lvs.* ovate-oblong, elliptical or obovate, the apex obtuse slightly notched or somewhat acute, the base narrowed, up to 9 cm. long and 5 cm. broad, membranous, *petioles* 2-4 mm. long; *stip.* ovate, acute, about 2 mm. long; *fls.* in clusters of 1-8; *pedi.* threadlike, 5-8 mm. long; *cal.* 2 mm. long, divided to about the middle, the lobes ovate, acute; *pet.* oblong, obtuse, 2.5-4 mm. long, the ligule about one-third as long; *drupe* oblong, blunt or acutish, about 9 mm. long.

Herb. Trin. 2115, 5954 and 10158. Bocas Islands and other dry districts, Trinidad and Tobago.
Lesser Antilles.

FAMILY 5. DICHAPETALACEAE.

Small trees or shrubs, sometimes climbing. *Lvs.* alternate, simple, stipulate. *Fls.* axillary, in cymose-umbels often joined to the petiole, small, hermaphrodite or unisexual. *Sep.* 5, free or partly united, imbricate. *Pet.* 5, usually 2-lobed, free or united into a tube. *Stam.* 5, free, or united with the tube of the corolla; *anths.* 2-celled, longitudinally dehiscent, the connective thickened on the back. *Glands* hypogynous, free or united. *Ovary* superior or inferior, 2-3 celled; *style* mostly simple, 2-3 fid at the apex. *Ovules* 2 in each cell, pendulous. *Fruit* a drupe, usually dry and sometimes splitting. *Seeds* 1 in each cell.

1. DICHAPETALUM Thouars.

Shrubs, erect or climbing. *Lvs.* shortly petioled, entire. *Stip.* 2 to each leaf. *Infl.* joined to the petiole. *Fls.* numerous, usually white. *Sep.* glabrous within. *Pet.* free. *Glands* opposite the petals. *Ovary* subglobose. *Styles* 1-3, free or united.

1. *D. pedunculatum* Baill.

Chaillètia pedunculata DC.

Climbing shrub, the twigs pubescent; *lvs.* elliptical-oblong, or somewhat obovate-oblong, the apex rather abruptly acuminate, the base unequal rounded or obtuse, 5.5-15 cm. long, 3.5-7 cm. broad, puberulous on both sides when young especially on the nerves, becoming more or less glabrous, the lateral nerves prominent beneath, *petioles* 5-10 mm. long, densely pubescent; *stip.* linear, densely pubescent, 5-10 mm. long; *infl.* much shorter than the leaves, densely yellowish or whitish woolly; (*fls.* white, fragrant, ex Broadway); *pedu.* united almost to the top of the petiole; *sep.* ovate, 1.5-2 mm. long, imbricate, densely whitish or yellowish woolly outside; *pet.* puberulous outside; *stam.* about 1 mm. long; *styles* distinct, 0.75-1 mm. long; *ovary* densely woolly.

St. Ann's, Aripo Hills, San Fernando Hill and Irois Forest, Trinidad, Guiana.

FAMILY 6. MALPIGHIACEAE.

Climbing or trailing shrubs or trees. *Lvs.* usually opposite, simple and entire, often glandular either on the petioles or leaf margin. *Stip.* mostly present, sometimes inserted on the petioles. *Infl.* various, axillary or terminal. *Fls.* hermaphrodite. *Cal.* 5-lobed, the lobes often with 2 glands outside. *Pet.* 5, unequal,

distinctly clawed, the blade wavy-toothed, fringed or lobed, often concave. *Disk* small. *Stam.* 10, sometimes some without anthers, hypogynous or nearly so; *fil.* united at the base; *anths.* opening longitudinally, the connective often enlarged. *Ovary* of 3 carpels, free or more or less united into a 3-celled ovary; *ovules* one in each cell ascending from a broad pendulous funicle; *styles* 3, usually distinct, slender throughout or enlarged and dilated at the apex. *Fruit* a drupe, nut-like, capsular or variously winged or crested.

Climbing or trailing plants, fruit winged or crested.

Samara with a dorsal wing or crest but no lateral wings.

Samara wing stout, beak-like.....1. *Brachypterys*.

Samara wing membranous, not beak-like.

Samara wings thickened on the upper margin.

Stam. 10, only 6 perfect, style tips foot-like or foliaceous.2. *Stigmaphyllon*.

Stam. 10, all perfect, style tips clavate or truncate.3. *Banisteriopsis*.

Samara wings thickened on the lower margin; *stam.* 10, all perfect.....4. *Banisteria*.

Samara with a dorsal wing or crest and lateral wings.

Lateral wings one on either side sometimes united.

Lvs. with stip. at the base of the petiole.5. *Mascagnia*.

Lvs. with stip. on the petiole.....6. *Hiraea*.

Lateral wings two on either side.

Wings all longitudinally parallel, the lateral pairs united above and below; infl. axillary.7. *Diplopterys*.

Wings 2 above and 2 below forming an X; infl. terminal.8. *Tetrapteryx*.

Erect shrubs or trees, fruit a drupe or nut.

Fil. hairy at the base.

Fruit a drupe9. *Byrsonima*.

Fruit separating into 2 or 3 carpels or capsules.10. *Spachea*.

Fil. glabrous.

Styles free, stones crested11. *Malpighia*.

Styles united, stones not crested.....12. *Bunchosia*.

1. BRACHYPTERYS A. Juss.

Shrubs erect, trailing or twining. *Lvs.* with 2 glands at the apex of the petiole. *Stip.* minute. *Fls.* solitary in the axils or in stalked, large-bracted, umbel-like corymbs. *Cal.* with 8 glands. *Pet.* yellow; *Stam.* 10, all perfect, glabrous, united at the base. *Ovary* 3-lobed; *styles* 3, free, with the stigmatic surface on the inside. *Fruit* a samara, solitary or 2 or 3 together, the body nut-like, warty, the wing beaked.

1. *B. ovata* (Cav.) Small.

B. borealis A. Juss.: *Stigmatophyllum ovatum* Ndz.

N. Amer. Fl. 25. 138-139: Fawc. and Rendl. Fl. Jam. 4. 235.

Low scandent *shrub* 1-1.5 m., the branches trailing; *lvs.* lanceolate, ovate-lanceolate or oblong-lanceolate, the apex acute or obtuse, the base rounded or acute, 4-11 cm. long, 2.5 cm. broad, glabrous above, minutely pubescent beneath; *petiole* 1-1.5 cm. long; *umbels* 2-4 flowered; the *pedu.* up to 6 cm. long; *fls.* 3.5 cm. diam.; *bracts* leafy, ovate or roundish, 1.5-4 cm. long; *pedi.* 1.5-3 cm. long; *sep.* 3.5-4 mm. long, the glands about 3 mm.; *pet.* 11-13 mm. long; *samara* about 12 mm. diam. with warty ridges, the beak woody, triangular, acute, 3-7 mm. long.

Lagoons and seashores, Trinidad and Tobago.

West Indies, Cent. and Northern South America to Brazil.

2. STIGMAPHYLLON A. Juss.

Woody climbing or trailing *vines*. *Lvs.* often variable in shape on the same plant with 2 glands near the junction of the petiole and mid rib, sometimes with marginal glands. *Stip.* minute. *Fls.* in axillary, stalked, umbel-like corymbs. *Cal.* persistent with 8 glands. *Pet.* yellow. *Stam.* 10, unequal, 6 perfect, 4 imperfect and opposite the glandular sepals; *fil.* more or less united below. *Ovary* 3-lobed; *styles* 3, free, unequal, the apex either foot-like, hook-like or foliaceous. *Samaras* 1-3, the wing thickened on the upper margin, the body smooth.

Lvs. heartshaped.

Lvs. with a deep closed sinus (overlapping lobes) conspicuously glandular fringed.....1. *S. ciliatum*.

Lvs. with a shallow, open sinus (often hardly cordate), a few sessile glands on the margin.

Wing of samara (very broad) about as long as the large nut.....2. *S. grenadense*.

Wing of samara (constricted above base) several times longer than the small nut and spatulate.

Lvs. glabrescent or quite glabrous below at maturity.....3. *S. convolvulifolium*.

Lvs. conspicuously greyish and adpressed pilose below at maturity.....4. *S. Humboldtianum*.

Lvs. not heart-shaped, usually ovate, oblong or elliptical.

Style tips foliaceous.....5. *S. puberum*.

Style tips hook-like or foot-like...6. *S. cordifolium*.

1. *S. ciliatum* (Lam.) Juss.

Banisteria ciliata Lam.

N. Amer. Fl. 25.145.

Climber; lvs. heart-shaped, or rounded heart-shaped, the apex rounded to somewhat acuminate, deeply heart-shaped at the base, 4-8 cm. long, glabrous or nearly so, the margin glandular fringed, *petioles* 1.5-4.5 cm. long, puberulous; *pedu.* and *pedi.* puberulous; *sep.* 4-5 mm. long, puberulous, the glands about half as long; *pet.* up to 25 mm. long, distinctly fimbriate; *styles* with a foliaceous appendage; *samaras* (not seen) about 2.5 cm. long, very broad.

Herb. Trin. 7267. Broadway, Irois to Cedros sea shore, Trinidad. St. Thomas to Southern Brazil and Uruguay.

2. *S. grenadense* Ndz.

N. Amer. Fl. 25.145.

Scandent shrub, velvety; lvs. ovate to suborbicular, or sometimes kidney-shaped, the apex shortly acuminate, the base heart-shaped, up to 9 cm. long, glabrous or nearly so above, finely pubescent beneath, with a few sessile inconspicuous glands on the margin, *petioles* long; *sep.* 3.5-4 mm. long, the glands about

half as long; *pet.* yellow, up to 13 mm. long, obscurely crenulate; *samara* nearly 3.5 cm. long, the nut 1.5 cm. diam., large and subspheroid, the wing a little longer than the body, very broad, up to 2.3 cm.

Eggers, 5726, Calder Hall, Tobago: Herb. Trin. 2363, Chaguanas, Trinidad is probably this species.
Grenada.

3. *S. convolvulifolium* (Cav.) Juss.

Banisteria convolvulifolia Cav.

Climber; *lvs.* mostly broadly heart-shaped, the apex acute, apiculate or long acuminate, the base usually heart-shaped, up to 13 cm. long by 10 cm. broad; glabrous above, pubescent beneath when young, becoming almost or quite glabrous, usually with a few sessile glands on the leaf margin, *petioles* up to 9 cm. long, puberulous; *pedu.* and *pedi.* finely pubescent; *sep.* pubescent, glandular; *pet.* yellow; *styles* with a foliaceous appendage; *samaras* 4-5 cm. long, puberulous, the upper side of the wing with a rounded, shallow lobe at the base.

General in dry places, Trinidad.

Lesser Antilles and Northern South America.

4. *S. Humboldtianum* A. Juss.

S. tiliifolium (H.B.K.) Ndz.: *S. adenodon* Juss.

Gr. Fl. 118: N. Amer. Fl. 25.143-144.

Lvs. ovate to suborbicular or heart-shaped, acute or rounded and mucronate at the apex, truncate, rounded or somewhat heart-shaped at the base, about 5-11 cm. long, pubescent beneath, becoming glabrous above, with sessile glands on the margin; *petioles* long; *pedu.* and *pedi.* finely pubescent; *sep.* 3-3.5 mm. long, the glands about half as long; *pet.* up to 9 mm. long; *samara* 3.5-4 cm. long, the inner edge broadly eared at the base, the body crested.

Not seen. Finlay and de Schach ex Niedenzu. Trinidad. Eggers, 5726, Tobago.

Nicaragua, Mexico, Panama, Northern and Eastern S. America.

5. *S. puberum* (Rich.) Juss.

Banisteria pubera Rich.

N. Amer. Fl. 25.144: Fawc. & Rendl. Fl. Jam. 4.237-238:

Urb. Symb. Ant. 8.337.

Climbing plant; *lvs.* oblong, elliptical, ovate or lanceolate, the apex long acuminate, the base rounded, truncate or obtuse, up to 14 cm. long, membranous, glabrous above, except for the

mid rib, finely appressed pubescent beneath, *petioles* up to 4 cm. long, appressed pubescent; *lvs.* on the flowering branches lanceolate or bract-like; (*fls.* red and yellow, fragrant, ex Broadway); *pedu.* and *pedi.* pubescent; *sep.* ovate, appressed pubescent, 3-3.5 mm. long the glands about half as long; *pet.* up to 11 mm. long; *styles* each with a foliaceous appendage; *samaras* not seen, oblong to oblong-lanceolate, wing up to 3.5 cm. long and 1.5 cm. broad at the base.

Herb. Trin. 7618, Broadway, Moruga, Trinidad. Tobago, ex Urban. West Indies, Panama and Northern South America to Rio and Peru.

6. *S. cordifolium* Ndz.

S. diversifolium Gr. not H.B.K.

N. Amer. Fl. 25.141: Britt. & Wils. Sc. Surv. Porto Rico 5.440.

Slender vine; *lvs.* oblong-ovate to ovate or orbicular-ovate, the apex abruptly pointed or rounded, mucronate, the base rounded or heart-shaped, 2.5-8 cm. long, 1.5-4.7 cm. broad, reticulate veined and shining above, densely pubescent beneath, *petioles* 4-10 mm. long; *sep.* 3-4 mm. long, the glands about half as long; *pet.* up to 13 mm. long; *styles* hook-like or foot-like; *samara* 1.5-2 cm. long, the inner edge of the wing with an obliquely rounded ear at the base.

Sieber 135, Lockhart, in Herb. Kew. Trinidad. Lesser Antilles.

3. *BANISTERIOPSIS* C. B. Robinson.

Climbing shrubs. *Lvs.* opposite, leathery, entire. *Cal.* with 8 or 10 glands, or glandless; *sep.* 5, broad, somewhat unequal, persistent. *Pet.* 5, the blades broad, denticulate to lacerate. *Stam.* 10; *fil.* unequal in length; *anths.* often with large connectives. *Ov.* 3-lobed; *styles* 3, terminal; *stig.* terminal, covering the clavate or truncate end of the style. *Samaras* 3 together, or fewer, each with an ascending or spreading dorsal wing, the wing thickened along the ventral margin.

Lvs. glandular on the margin; *fls.* in a conspicuous axillary or terminal thyrsus 1. *B. leptocarpa*.

Lvs. not glandular on the margin; *fls.* in fasciculate axillary umbels.... 2. *B. lucida*.

1. *B. leptocarpa* (Benth.) comb. nov.

Banisteria leptocarpa Benth. in Hook. Lond. Journ. Bot. 7.130.

Vine, the young stems rusty woolly, becoming glabrate; *lvs.* ovate or oblong-elliptical, the apex acute or acuminate, the

base obtuse or somewhat heart-shaped, 10 cm. long and 5.5 cm. broad or less, leathery, glabrous or with a few scattered hairs above, glabrous or rarely pubescent beneath, the margin minutely and remotely glandular-toothed; *fls.* in a conspicuous, many-fl. axillary or terminal thyrus; *sep.* about 2.5 mm. long, puberulous, glands, when present, about half as long; *pet.* yellow, fringed; *samara* pubescent, about 2.5 cm. long, the nut 3 mm. diam., the wing spatulate, up to 7 mm. broad near the apex, not conspicuously lobed as in *B. lucida* (Rich) Small.

Herb. Trin. 10265 and 10174, Broadway, Aripo Savannah. Trinidad. Guiana.

2. *B. lucida* (Rich) Small.

N. Amer. Fl. 25. 133.

Vine 20 m.; *lvs.* ovate-oblong or ovate-elliptical, or obovate, the apex long acuminate, the base more or less wedge-shaped or rounded, about 11 cm. long and 4.5 cm. broad, glabrous on both sides except for a few minute adpressed hairs beneath; *petioles* 4-8 mm. long; *sep.* 2.5-3 mm. long, the glands about half as long; *larger petals* 11-13 mm. long; *styles* not foliaceous; *samaras* densely pubescent, 4.5-6.5 cm. long, 16-18 mm. broad at the top, gradually narrowing to 4.5 mm. near the crested body, the inner edge of the wing with an acuminate ear about 12 mm. long, body about 9 mm. diam.

Britton Hazen and Mendelson 603, Forest, East of Arima; Herb. Trin. 2358, Crueger, Guanapo Road and 6615, Santa Cruz, Trinidad. Porto Rico, St. Vincent. Northern South America.

4. BANISTERIA L.

Shrubs trailing or climbing on trees. *Fls.* small, usually on leafy-bracted panicles. *Cal.* with 8 glands or sometimes none, the sepals often recurved at the tips, persistent. *Pet.* usually yellow. *Stam.* 10, unequal, all perfect; *fil.* united at the base. *Ovary* 3-lobed; *styles* 3, distinct, somewhat unequal, pointed on the back. *Samaras* 1-3, the wing thickened on the lower margin.

Sep. with recurved tips.

Samara wings broad, not constricted

above the body 1. *B. reticulata*.

Samara wings relatively narrow,

constricted above the body 2. *B. nervosa*.

Sep. with erect tips.

Lvs. large, silky pubescent beneath;

cor. yellow 3. *B. apiculata*.

Lvs. small, glabrous; cor. purple 4. *B. purpurea*.

1. *B. reticulata* C. B. Robinson.*Malpighia reticulata* Poir.

Lvs. oblong, oblong-lanceolate or elliptical-oblong, more or less abruptly acuminate at the apex, rounded at the base, up to 28 cm. long and 13 cm. broad, glabrous on both sides or sometimes with scattered hairs beneath, leathery, shining above, the reticulation prominent on both sides but more so beneath, *petioles* stout, about 1 cm. long; *fls.* yellow, fragrant, in rusty-woolly panicles; *bracteoles* ovate, leafy, 0.5-1 cm. long; *sep.* lanceolate or ovate-lanceolate, recurved at the tips, 3.5-5 mm. long, the glands about half as long; *samara* 2.5 cm. long, about 2 cm. broad, the wing suborbicular on the upper side, where it is developed above the body, leathery, puberulous.

Sea coast, Irois to Cedros, Trinidad.
Northern South America.

2. *B. nervosa* (Juss.) comb. nov.*Heteropterys nervosa* Juss.*H. suberosa* Gr. var. *B. Candolleana* (Juss.) Ndz.*Banisteria suberosa* C. B. Robinson in N. Amer. Fl.*Heteropterys Lessertiana* Juss.*H. suberosa* Gr. var. *Lessertiana* (Gr.) Ndz.

N. Amer. Fl. 25. 137.

Lvs. oblong-lanceolate or ovate, mostly acuminate or acute at the apex, rounded or obtuse at the base, 3.5-12 cm. long, 1.8-4.5 cm. broad, glabrous or nearly so, shining above, prominently reticulate on both sides, *petiole* short; *infl.* corymbose, rusty-pubescent; *bracteoles* ovate or elliptical, 2-4 mm. long; *sep.* ovate, lanceolate or oblong, 3-4 mm. long, with or without glands, the tips recurved; *samaras* 3-3.5 cm. long, usually solitary, the wing pubescent, relatively narrow, more or less constricted at the base, and eared near the base.

There are two known varieties based on the presence or absence of glands on the calyx.

Var. A Lessertiana (Juss.) Gr. has a calyx bearing glands.

Sieb. 322 ex Ndz. Trinidad.

Var. B. Candolleana (Juss.) Ndz. has a glandless calyx.

Herb. Trin. 2366, 2367, 5766 and 1587.

Bocas Islands, Trinidad.

Lesser Antilles, Panama, Northern South America.

3. *B. apiculata* (Miq.) C. B. Robinson.

H. macrostachya Juss.

Gr. Fl. 121: N. Amer. Fl. 25. 136.

Lvs. broadly ovate-oblong, elliptical or obovate, the apex obtuse, rounded or shortly pointed, sometimes apiculate, the base obtuse or somewhat heart-shaped, up to 16 cm. long and 9 cm. broad, glabrous or nearly so and shining above, rusty or yellowish lustrous silky-pubescent beneath, glandular within the margin beneath, *petioles* about 1 cm. long; *panicles* elongated, thyrs-like, rusty-silky, mostly longer than the leaves; *sep.* ovate, with erect tips, 3-5 mm. long, the glands nearly as long; *cor.* yellow; *samara* 6-6.5 cm. long, the wing oblong or somewhat obovate, rusty pubescent.

Bocas Islands. Coastal and dry places, Trinidad.
Lesser Antilles and Northern South America.

4. *B. purpurea* L.

Fawc. and Rendl. Fl. Jam. 4. 234: N. Amer. Fl. 25. 136.

Lvs. lanceolate, ovate, ovate-oblong, or elliptical, acute, rounded or obtuse at the apex, 1.5-5 cm. long, 2-3 cm. broad, membranous, glabrous, or puberulous, *petiole* with 2 glands at about the middle; *fls.* in terminal or axillary corymbs, sparingly pubescent; *bracts* and *bracteoles* minute; *pedi.* jointed near the base; *cal.* 8 glandular, *sep.* oblong to ovate-oblong with erect tips, about 2.5 mm. long; *pet.* purple; *samaras* 2-3 cm. long, obliquely obovate-oblong, with a slight projection on the upper margin near the base, sparingly pubescent.

Ndz. places the Trinidad plant under var. *B. antillana* Ndz. differing from his var. *A. puberula* in having mature leaves quite glabrous; *infl.* 3-10 fld. instead of up to 30-fld.; *samara* wing up to 2 cm. long and 9 mm. broad instead of up to 3 cm. long and 11 mm. broad. He gives two forms of the variety from Trinidad.

f. *oblonga* Ndz. *lvs.* lanceolate or ovate-oblong, acute at the apex, up to 5.5 cm. long and a little more than 2 cm. broad. Sieb. 276.

f. *typica* Ndz. *lvs.* ovate or oval or subrotund up to 5 cm. long and 3 cm. broad. Sieb. 276.

No Trinidad specimen seen. Not known from Trinidad except by Sieber's collections.

West Indies, Venezuela and Colombia.

5. MASCAGNIA Bertero.

Climbing or trailing shrubs. *Lvs.* membranous or leathery. *Stip.* at the base of the petiole. *Cal.* with 8, or rarely 10 glands; *sep.* broad, persistent. *Cor.* variously coloured. *Stam.* 10, all perfect. *Ovary* 3-lobed; *styles* 3, distinct, unequal. *Samaras* 3 together, with distinct or united lateral wings, the dorsal wing smaller than the lateral wings or obsolete.

Lateral wings of samara encircling the fruit.

Styles about equal, not twisted; infl.

short, with rufous pubescence1. *M. sepium*.

Styles unequal, the 2 posterior ones

longer and twisted; infl. long with

greyish-white pubescence2. *M. ovatifolia*.

Lateral wings of samara distinct3. *M. volubilis*.

1. *M. sepium* sub-species *bierosa* (Moric. ex Juss.) Gr.

Branchlets dark reddish-brown with a short dark pubescence; *vs.* ovate, shortly acuminate, almost cuspidate at the apex, rounded or heart-shaped at the base, 7-12.5 cm. long, 3.5-7.5 cm. broad, somewhat leathery and shining, glabrous above, glabrous or with brownish scattered appressed hairs beneath, rather conspicuously reticulate veined, *petiole* about 1 cm. long; *fls.* in short (up to 7 cm.) axillary panicles, conspicuously rufous-pubescent; *styles* about equal, not twisted; *samaras* wing up to 3.3 cm. diam., the dorsal erect up to 1 cm. long and 4 mm. broad.

Ndz. cites Anderson, Trinidad and Broadway 4465, Tobago, under *M. sepium* sub-species *bierosa* var. *aequatorialis* Ndz. which has leaves hispid below.

Santa Cruz, Balandra, Trinidad. Tobago ex Ndz.

Honduras, S. America to Bolivia and Argentina.

2. *M. ovatifolia* (H.B.K.) Griseb.

Hiraea ovatifolia H.B.K.

Gr. Fl. 121: N. Amer. Fl. 25. 120.

Branchlets glabrescent or clothed with very short, whitish down; *lvs.* ovate, conspicuously acuminate at the apex, the base rounded or somewhat heart-shaped, 7-14 cm. long, 3.5-9 cm. wide, glabrous on both sides, somewhat leathery and shining, very strongly and conspicuously reticulate veined on both sides; *petiole* about 1 cm. long; *infl.* a long pyramidal thyrsus (compound panicles) whitish pubescent; *styles* unequal, the two posterior ones longer and twisted; *samaras* inconspicuously keeled on the back, the keel up to 7 mm. long, rarely reaching 2 mm. broad, the lateral wings rounded and united above and below, heart-shaped at the base, membranous, 2-3.3 cm. diam., encircling the fruit.

The leaves of the Trinidad material agree exactly with those of Smith 344 from Colombia which is cited by Ndz. as *M. nervosa* Ndz. It is probable that the latter species is therefore synonymous.

Herb. Trin. 756 : Crueger, Maraval : Lockhart 232 : 2361 Circular, Road, St. Joseph Village, San Fernando, Trinidad.
Salvador, Panama and Northern South America.

3. *M. volubilis* (Sims) Ndz.

M. Simsiana Griseb.

N. Amer. Fl. 25. 119.

Branches rough with warty lenticels; *lvs.* ovate, ovate-lanceolate or oblong-lanceolate, the apex somewhat acuminate or bluntish, the base abruptly narrowed or rounded, 6-14 cm. long, glabrous, *petioles* stout, the glands inconspicuous or obsolete; *sep.* 3.5-4.5 mm. long, the glands about half as long; *pet.* yellow, mostly 9-11 mm. long, the margin jagged and with sharp basal ears; *samaras* 3-4.5 cm. wide, the lateral wings fan-shaped or wedge-fan-shaped, distinct from each other, thickly pubescent, deeply jagged or incised.

Herb. Trin. 6045, Lunt, Chatham Woods, Trinidad. Eggers, 5618 and 5714 Tobago.

Guatemala, St. Vincent, Grenada, Guiana.

6. *HIRAEA* Jacq.

Climbing *shrubs*. *Lvs.* mostly leathery; *petioles* short with slender stipules borne upon them. *Cal.* with or without glands. *Sep.* oblong-deltoid, persistent. *Cor.* usually yellow. *Stam.* 10, all perfect; *anths.* subglobose, oblong or ovoid. *Ovary* 3-lobed; *styles* 3, distinct, more or less unequal. *Samaras* 3 together, crested on the back and with distinct lateral wings.

Lvs. with lateral veins deeply impressed

above.....1. *H. reclinata*.

Lvs. with lateral veins not or barely impressed above.

Lvs. glabrous beneath except on the midrib.....2. *H. fagifolia*.

Lvs. whitish or yellow-sericeous

beneath.....3. *H. faginea*.

1. *H. reclinata* Jacq.

Gr. Fl. 121.

Climbing *shrub* about 6 m.; *lvs.* obovate or obovate-oblong, rounded or acute and apiculate at the apex, narrowed to the obtuse, truncate or slightly lobed base, hairy when young becoming glabrous except for the mid rib which is whitish pubescent beneath, the

lateral veins deeply impressed above, *petioles* stout, 5-15 mm. long, whitish pubescent, with 2 glands at about the middle and two *stipules* near the base within; *infl.* densely hairy, the hairs long appressed; *fls.* yellow; *cal.* without glands, densely hairy; *samara* keel short, wings one on each side, distinct, roundish, about 23 mm. long and 16 mm. broad, membranous.

Thickets and woodlands, Trinidad and Tobago.
Colombia and Venezuela.

2. *H. fagifolia* (DC.) Juss.

H. Riedleyana Juss.

Gr. Fl. 121: N. Amer. Fl. 25.123.

Lvs. obovate, obovate-oblong or elliptical, acute or abruptly shortly acuminate at the apex, narrowed to the obtuse base, up to 14 cm. long and 6.5 cm. broad, glabrous, with the mid-rib whitish pubescent beneath, *petiole* 5-11 mm. long, stout, pubescent, with 2 glands and 2 awl-shaped *stipules* near the leaf blade; *fls.* in short stalked clusters, the *pedi.* longer than the *pedu.*, pubescent; *sep.* 3-4 mm. long, puberulous, 8-glandular; *samaras* rounded or kidney-shaped, the wings about 2.5 cm. long and 1.5 cm. wide, membranous, finely puberulous.

The Trinidad plant is var. *Candolleana* Ndz. f. *Riedleyana* (Juss.) Ndz.

Herb. Trin. 2359: 1773 (Feb. 1848), Crueger, Caroni: Fendler, 249, Trinidad, and 1595 and 670, no locality.
Honduras, Guatemala to Northern South America.

3. *H. faginea* (Sw.) Ndz.

Malpighia faginea Sw.

Sw. Fl. Ind. Occ. 3. 850.

Lvs. obovate-oblong to elliptical, the apex abruptly and shortly acuminate or acute, apiculate, narrowed to the obtuse base, up to 14 cm. long and 6.5 cm. broad, glabrous or nearly so above, whitish-yellowish silky pubescent beneath, *petioles* about 7 mm. long, pubescent, with 2 glands and 2 awl-shaped *stipules* near the leaf blade; *stip.* 4-7 mm. long; *infl.* 3-branched, pubescent; *cal.* 2-3 mm. long, pubescent, without glands, the lobes triangular acute; *pet.* glabrous; *fruit* not seen (according to Ndz., the *samaras* are subglabrous, the lateral wings more than 1.5 cm. high and 1 cm. broad, the dorsal crest 0.75 cm. high and 3 mm. broad, wings rather thick and coriaceous).

Herb. Trin. 8087, Dannouse, Laventille, Trinidad.
Lesser Antilles, Northern South America.

7. DIPLOPTERYS A. Juss.

Scandent shrub. *Lvs.* opposite, entire, the margin with obscure thickened glands. *Stip.* none. *Fls.* yellow, in axillary branched umbels, the branches short, 4-flowered. *Pedu.* very short with bracts and 2 bracteoles. *Cal.* 5-lobed with 8 glands. *Pet.* clawed, fringed. *Stam.* 10, all perfect; *fil.* glabrous, united below, the connective thickened and glandular. *Ovary* 3-lobed; *styles* 3, truncate. *Samaras* 3, longitudinally and shortly 5-winged or 5-keeled, the dorsal one woody, the lateral ones in pairs, longitudinally parallel, joined at the apex and base.

1. D. Marshalliana Riley.

Kew Bull. 1925. p. 135.

Scandent shrub; *lvs.* ovate, the apex acuminate, the base wedge-shaped or obtuse, 13.5-15 cm. long, 5.5-6.5 cm. broad, glabrous and with the reticulation prominent and raised on both sides, pallid beneath, *petiole* 7-10 mm. long; *pedu.* in clusters of 3-4, 7-8 mm. long, appressed reddish-pubescent; basal bracts 0.5 mm. long; bracteoles 2, at about the middle of the *pedu.*, triangular-ovate, 1 mm. long; *pedi.* in clusters, 15-17 mm. long, surrounded by bracteoles; *cal.* 2 mm. long, the lobes rounded; *pet.* yellow, fringed, densely villous outside, glabrous within, the blade of the larger 12 mm. long, 9 mm. broad, the claw 2.5 mm. long; *fil.* unequal, 1.5-2.5 mm. long, slightly united at the base; *anths.* 1.5 mm. long, minutely and sparsely setose; *ovary* 3-angled, densely villous; *styles* unequal, 3-5 mm. long, awl-shaped, incurved, truncate, glabrous; *stigma* minutely scale-like; *fruit* unknown.

Riley 94 in Herb. Kew and Mus. Brit., Arena Reserve: Herb. Trin. 6627, Dannouse, Guapo; 8299, Caracciolo, Caura; 11624 Marshall, Arima-Blanchisseuse Rd. and unnumbered, Dannouse, Tabaguite. Endemic, Trinidad.

8. TETRAPTERYS Cav.

Climbing or trailing shrubs. *Lvs.* without or rarely glandular. *Stip.* inconspicuous, deciduous. *Fls.* usually in panicked umbels or racemes, terminal. *Cal.* 8-glandular. *Pet.* yellow. *Stam.* 10, all perfect; *fil.* united at the base. *Ovary* 3-lobed, the lobes crested on the back and with two appendages on each side; *styles* 3, distinct, equal or nearly so, the apex slightly enlarged. *Samaras* 1-3, crested on the back, each 4-winged, X-shaped, the two upper usually larger than the two lower.

Dorsal and intermediate crests of samara conspicuous, wing-like. 1. *T. discolor.*

Dorsal and intermediate crests of samara reduced, barely visible. 2. *T. citrifolia.*

1. **T. discolor** (G. F. W. Meyer) DC.

Triopteris discolor G. F. W. Meyer.

Gr. Fl. 121.

Climbing *shrub*; *lvs.* elliptical or elliptical-oblong, the apex acute or obtuse, the base wedge-shaped or obtuse, up to 13.5 cm. long and 5.5 cm. broad, somewhat leathery, glabrous on both sides, *petioles* 5-10 mm. long, glabrous; *stip.* interpetiolar, about 2 mm. long, deciduous; *fls.* in terminal leafy-bracted panicles longer than the leaves, the *bracts* 8-20 mm. long; *pedi.* hoary appressed pubescent, jointed at about the middle; *sep.* puberulous, rounded or truncate, about 3 mm. long, the glands more than half as long; *samara* wings unequal, the upper 16-20 mm. long, the lower about 10 mm., membranous, appressed pubescent, dorsal crest somewhat semi-orbicular, 4 mm. long, intermediate crests many, obovate or linear, 2-8 mm. long.

Ndz. gives two varieties from Trinidad and Tobago:

(1) var. *typica* Ndz., the normal plant.

(2) var. *trinitensis* (Juss.) Ndz.: *T. trinitensis* Juss. *Lvs.* oval or obovate up to 12.5 cm. long and 6 cm. broad.

A form with shorter, broadly ovate and shortly suddenly acuminate leaves.

Herb. Trin. 666, Crueger: Eggers, 1135, Caroni: Herb. Trin. 9792, Broadway, heights of Aripo. General in thickets and forest borders in wet or moist districts, Trinidad and Tobago.

Costa Rica, Guatemala, Haiti, St. Vincent, N. S. America down to Bolivia and Matto Grosso in Brazil.

2. **T. citrifolia** (Sw.) Pers.*T. inaequalis* Cav.

Ndz. Pflanzenreich 4. 141. 207. (1928).

Climbing *shrubs*; *lvs.* ovate, oval, obovate or even more or less oblong or lanceolate, rounded or cordate at the base, acute or acutely acuminate at the apex, up to 17.5 cm. long and 7 cm. broad, chartaceous, glabrate when fully developed, and more or less shining; *petioles* puberulous or at length glabrate, 1-1.3 cm. long; *stip.* broadly ovate, 1-1.5 mm. long; *floral leaves* reduced, roundish-cordate, 1-5 cm. long; *infl.* similar to that of *T. discolor*; *bracts* ovate-acute or lanceolate, 1.5-3 mm. long; *bracteoles* semiorbicular or round, about 1 mm. long; *glands* on sepals 2.5-3 mm. long, the *sepals* themselves exceeding the glands by 1.5-2 mm., oval; *fls.* 1.3-1.5 cm. in diameter; *samara* woolly, nut about 6 mm. in diameter, 2 upper wings 2-2.75 cm. long, 0.7-1 cm. wide; 2 lower wings up to 1.3 cm. by 4-5 mm.; dorsal crest reduced to 1-2.5 mm. broad, intermediate crests very often reduced to an inconspicuous slightly tuberculate wart.

4302, Broadway, ex Nz. Tobago.

West Indies.

9. BYRSONIMA Rich.

Trees or shrubs. Lvs. opposite with glands, and with united persistent stipules in the axils. *Fls.* in terminal panicles or racemes. *Cal.* persistent with 10 conspicuous glands. *Pet.* the blades rounded or kidney-shaped. *Stam.* 10, all perfect; *fil.* hairy and lightly united at the base. *Ovary* 3-celled; *styles* 3; *stig.* awl-shaped. *Drupe* ovoid to globose, 3-celled, the endocarp bony or woody with sharp angles outside.

- Low shrub, the stems gnarled 1. *B. verbascifolia*.
 Trees, the stems not gnarled.
 Lvs. glabrous 2. *B. trinitensis*.
 Lvs. variously hairy often becoming
 glabrous with age.
 Lvs. mostly broadly elliptical and
 usually rusty-woolly beneath. 3. *B. crassifolia*.
 Lvs. lanceolate or oblong, minutely
 pubescent to glabrous beneath.
 Anth. cells glabrous. *Cal.*
 glands 2 mm. long on
 the fruit. 4. *B. spicata*.
 Anth. cells pilose. *Cal.* glands,
 when present, 4-5 mm. long
 on the fruit. 5. *B. gymnocalycina*.

1. *B. verbascifolia* (L.) Rich.

N. Amer. Fl. 25. 170.

Low shrub, the stems gnarled and woody; *lvs.* oblanceolate to broadly obovate, acute, rounded or notched at the apex, wedge-shaped at the base, up to 26 cm. long and 13 cm. broad including the petiole, thickly or thinly pubescent above, becoming glabrous with age, woolly beneath; *fls.* in rusty-woolly panicles rather longer than the leaves; *bracteoles* lanceolate with a thread-like apex, woolly; *pedi.* 6-10 mm. long, woolly; *sep.* ovate, acute, about 3 mm. long, the glands about 1.5 mm.; *pet.* yellow up to 12 mm. long; *anths.* cells with weak-hairs; *drupes* not seen.

Ndz. places Crueger's Trinidad plant under var. *villosa* Gr. forma *spathulata* Ndz.

Piarco Savannah, Trinidad.

Isle of Pines, Northern South America.

2. *B. trinitensis* Juss.

N. Amer. Fl. 25. 170.

Tree of about 6 m. high; *lvs.* oblong-elliptical, obovate, obtuse or sometimes emarginate at the apex, abruptly narrowed or wedge-shaped at the base; up to 10 cm. long and 6 cm. broad, glabrous on both sides, somewhat shiny above, *petioles* 1-1.5 cm. long; *panicles* shorter than the leaves, puberulous or becoming glabrous; *sep.* broadly ovate to deltoid, 3-5 mm. long, increasing on the fruit, the glands about half as long; *pet.* white; *anths.* cells with long weak hairs; *drupe* globose-ovoid about 1 cm. diam.

Tucuche, Trinidad.

Dominica, Martinique.

3. *B. crassifolia* H. B. K.

N. Amer. Fl. 25. 168.

Small tree; *lvs.* very variable in size and shape, mostly broadly elliptical, acute or obtuse at the apex, wedge-shaped or rounded at the base, 20 cm. long and 12 cm. broad or less, at first woolly above becoming glabrous with age, usually densely woolly beneath, becoming glabrous, *petioles* 5-18 mm. long, usually woolly; *panicle* thickly reddish woolly; *sep.* ovate, 3.5-4.5 mm. long, the glands about 2 mm. long; *pet.* yellow up to 10 mm. long; *anths.* cells with long weak hairs; *drupe* globose up to 12 mm. diam.

Ndz. records the following forms from Trinidad:

var. *typica* Ndz.:—forma *Kunthiana* Ndz. and forma *cubensis* (Juss.) Ndz.

var. *jamaicensis* Urb. and Ndz. Under this he cites Herb. Trin. 2354; *lvs.* ovate, ovate-lanceolate or lanceolate from an acute base and with an elongated very acute apex.

General in savannahs and dry places, Trinidad.

West Indies, Cent. and Northern S. America.

4. *B. spicata* Rich. Serrette.

Gr. Fl. 115: N. Amer. Fl. 25. 168.

Large tree; *lvs.* lanceolate or oblong-lanceolate, sometimes elliptical, the apex obtuse, acute or acuminate, the base wedge-shaped, up to 18 cm. long and 5.5 cm. broad, minutely pubescent when young, usually becoming glabrous; *petioles* 5-12 mm. long, pubescent; *sep.* ovate, 2.5-3 mm. long, the glands about 1.5 mm. long; *pet.* yellow, up to 8 mm. long; *anths.* cells glabrous; *drupe* yellow, globose up to 12 mm. diam.

General on poor soils. Trinidad and Tobago.

West Indies. Central and Northern S. America.

5. *B. gymnocalycina* Juss.*B. ceranthera* Benth.

Lvs. oblong-elliptical, the apex obtuse or acute, the base wedge-shaped, up to 14.5 cm. long and 5 cm. broad, glabrous above except for the mid-rib which is sometimes puberulous, minutely pubescent to glabrous beneath, the mid-rib with longer hairs or glabrous, *petioles* 1-2 cm. long; *panicle* rusty-woolly; *sep.* usually glandular; *pet.* 4; *anths.* pilose, the appendage glabrous; *drupe* 3-2 celled (*ex* Crueger); *cal.* glands 4.5 mm. long on the fruit.

The Trinidad plant with its glandular sepals is the form described by Benthams as *B. ceranthera*. *B. gymnocalycina* Juss. has no glands. Otherwise the two plants are identical.

Herb. Trin. 667, no locality, according to Britt. in Prov. List. Trin. Plants (ined.); Herb. Trin. 1596. ? locality.

Guiana. Venezuela (*fide* Ndz.)

10. *SPACHEA* A. Juss.

Small trees. *Lvs.* opposite, oblong or lanceolate, entire, often with transparent dots, petioled. *Fls.* in terminal, racemose panicles, rusty hairy. *Cal.* 5-lobed with 8-10 glands, persistent. *Pet.* 5, clawed, glabrous. *Stam.* 10, sometimes some of them abortive; *fil.* slender, hairy below. *Ovary* 2-3 lobed; *styles* 2-3, free. *Caps.* nut-like, 2-celled, rarely 3-celled, at length dehiscent.

1. *S. elegans* (G. F. W. Meyer) Juss.*Malpighia elegans* G. F. W. Meyer.

Small tree, *lvs.* oblong-lanceolate, oblong-elliptical or even obovate and cuspidate, the apex obtuse or acute, the base narrowed, up to 13 cm. long by 6.5 cm. broad, minutely transparently dotted, minutely pitted above, glabrous or with scattered hairs on both sides except for the mid rib beneath; *panicles* about 10 cm. long; *fls.* pinkish; *bracteoles* in pairs, one transformed into a large gland; *sep.* rounded, fringed, about 2 mm. long, the glands about half as long; *pet.* toothed; *styles* usually 2; *carpels* ovoid, glabrous, 5 mm. long, 3 mm. diam.

S. perforata Juss. recorded from St. Vincent and cultivated in the Royal Botanic Gardens, Trinidad, appears to be the same species.

Caroni, Chaguanas, Moruga, La Brea to Irois, Trinidad.
Guiana. Colombia (*fide* Ndz.)

11. MALPIGHIA L.

Shrubs or small *trees*. *Lvs.* opposite, shortly petioled, glabrous or hairy, the hairs sometimes stinging, entire or spiny-toothed. *Stip.* minute, deciduous. *Fls.* in axillary or terminal clusters or corymbs. *Cal.* 5-lobed, with 6-10 glands. *Pet.* red, pink or white, the limb roundish, toothed or fringed. *Stam.* 10, all perfect; *fil.* united below, glabrous throughout; *anths.* short, the connective usually inconspicuous. *Styles* 3, free, often thickened above. *Drupe* red or orange, the stones with 3-5 dorsal crests.

M. glabra L. native of Jamaica, other West Indian Islands and Cont. Trop. America is not known to be native of Trinidad. It is in cultivation and the fruits are used for preserves.

M. coccigera L. Trinidad ex Urb. Symb. Ant. 8. 340 is only known in cultivation.

1. *M. puniceifolia* L. West Indian Cherry.

N. Amer. Fl. 25. 156: Fawc. and Rendl. Fl. Jam. 4. 226.

Tree up to 8 m., *lvs.* variable in shape, obtuse, rounded or notched at the apex, more or less wedge-shaped at the base, 2-8 cm. long, 1-4 cm. broad, glabrous, subsessile; *fls.* in sessile or subsessile clusters of 1-4; *pedi.* threadlike, 5-9 mm. long, puberulous or glabrous; *sep.* ovate, more or less pubescent; *pet.* pink, 16-21 mm. wide, the larger 7-9 mm. long, slightly keeled; *drupe* scarlet, ovoid or subglobose, 10-15 mm. diam. the stone roundish, 3-crested.

The Trinidad plant is var. *vulgaris* Ndz. Sieb. 261.

Chacachacare, Trinidad.

West Indies and Northern South America.

12. BUNCHOSIA Rich.

Trees or *shrubs*. *Lvs.* usually with 2 glands near the base. *Fls.* in axillary racemes. *Cal.* 8-10 glandular. *Fil.* glabrous at the base. *Ovary* 2-3 celled; *styles* wholly or partly united. *Fruit* a drupe with 2-3 stones, the stones without crests.

1. *B. glandulifera* (Jacq.) H.B.K.

N. Amer. Fl. 25. 162.

Shrub; *lvs.* broadly-ovate or elliptical, acute or short acuminate at the apex, obtuse or rounded at the base, up to 15 cm. long and 9.5 cm. wide, glabrous above, sparsely pubescent beneath,

papery, *petioles* 5-7 mm. long, pubescent; *racemes* about 10 cm. long or less; *pedi.* pubescent; *sep.* almost entirely covered by the glands; *pet.* up to 8 mm. long; *ovary* and style pubescent; *drupe* 2-lobed, about 2 cm. long.

Herb. Trin. 1370, 1947 and 308 Crueger, Trinidad: Herb. Trin. 11911, Marshall, Tobago.

Porto Rico, Montserrat, Martinique, Guadeloupe, Venezuela.

DOUBTFUL SPECIES.

2. ***B. nitida*** (Jacq.) DC. a West Indian plant is recorded by Gr. p. 116, under *B. polystachya* DC. as collected by Anderson in Trinidad. "*Lvs.* large, elliptical-oblong, pointed at both ends, glabrous, biglandular near the base; *pedi.* articulated near the middle."

It is not cited by Ndz. from Trinidad and there is no other record of its occurrence in the island.

FAMILY 7. RUTACEAE.

Shrubs or *trees*. *Lvs.* mostly compound, generally opposite and glandular dotted, without stipules. *Fls.* usually hermaphrodite sometimes polygamous or dioecious. *Sep.* 3-5, imbricate, free or united. *Pet.* 3-5, imbricate, rarely valvate, usually free. *Stam.* as many as the petals or twice as many; *fil.* free or united below; *anths.* 2-celled, turned inwards, opening longitudinally, the connective often glandular at the apex. *Disk* usually present. *Ovary* superior, of 1-5, sometimes more, sessile or stalked, free or united carpels; *styles* free or united; *ovules* usually 2 in each cell. *Fruit* of 1 or several cocci, a capsule, berry or drupe.

The most important economic products of this order grown in the Colony are the orange, the grapefruit and the lime. *Murraya exotica* L. an Asiatic plant is very suitable for hedges.

Ovary 2-5 lobed.

Fls. with a conspicuous disk. 1. ***Esenbeckia***.

Fls. with an inconspicuous disk. 2. ***Zanthoxylum***.

Ovary not lobed. 3. ***Amyris***.

1. **ESENBECKIA** Kunth.

Shrubs or trees. Lvs. alternate or rarely opposite with 1 to 3 leaflets, entire, with transparent dots. *Fls.* hermaphrodite, in terminal or axillary panicles. *Cal.* 4-5 lobed or *sep.* 4-5, imbricate. *Pet.* 4-5, imbricate or slightly valvate. *Disk* conspicuous, round and flat or cup-shaped, entire or 8-10 lobed. *Stam.* 4-5, inserted between the lobes of the disk. *Ovary* sessile on the disk or immersed in it, deeply 4-5 lobed, 4-5 celled, often densely warty or somewhat prickly; *style* basal, short; *stig.* simple, capitate or 4-5 lobed; *ovules* 2 in each cell, collateral. *Caps.* subglobose, warty, prickly or coarsely wrinkled, dividing septicidally into 5 carpels. *Carp.* loculicidally 2-valved. *Seeds* 1 in each cell enclosed in elastic horny or papery endocarp dividing in two at dehiscence.

Lvs. abruptly pointed, fruit warty 1. *E. pilocarpoides*.
Lvs. obtuse, capsule with woody prickles 2. *E. attenuata*.

1. **E. pilocarpoides** H. B. K. Gasparce.

E. castanocarpa Gr.

Gr. Fl. 135: N. Amer. Fl. 25. 202.

Tree 5-20 m.; *lvs.* alternate with 1 or rarely 3 leaflets, oblong to obovate-oblong, the apex rather abruptly acuminate, the base rounded or wedge-shaped, up to 23 cm. long and 8.5 cm. broad, membranous, glabrous on both sides, *petioles* slightly margined, 2-4.5 cm. long, glabrous; *fls.* in terminal, pubescent panicles, shorter than the leaves, shortly branched; *sep.* ovate to rounded, obtuse, glabrous, barely fringed; *pet.* yellow, ovate-roundish, about 4 mm. long; *disk* 3-4 mm. diam., forming a broad flat ring around the ovary; *fil.* short, inserted near the margin of the disk; *ovary* depressed, warty; *stig.* club-shaped, capitate, *caps.* 5-lobed, bursting within and at the top, 1 cm. long, 2-3 cm. broad after bursting, warty outside; *seeds* ovoid, 9 mm. long with a shining black spot near the base.

Forest, Talparo and Chaguanas, Trinidad: Broadway, 3843.
The Widow, near Easterfield, Tobago.
Martinique and Northern South America.

2. **E. attenuata** Griseb.

Gr. Fl. 135.

Tree; *lvs.* opposite or subalternate with one leaflet, oblong-lanceolate, the apex obtuse, the base wedge-shaped, up to 15 cm. long and 5 cm. broad, somewhat leathery, glabrous on both sides; *petioles* 1-1.5 cm. long; *infl.* a raceme of cymes, shorter than the

leaves, puberulous; *sep.* roundish, fringed, pubescent, about 2 mm. long; *pet.* ovate, obtuse, about 5 mm. long, pubescent outside; *disk* shallowly cupshaped, as long as the ovary; *caps.* globose, 1.5-3 cm. diam., thickly covered with woody spines, more or less separating into 5 2-valved cocci.

Tucuche, Trinidad. Endemic.

2. ZANTHOXYLUM Linn.

Shrubs or *trees*, sometimes prickly. *Lvs.* alternate, pinnate, with or without an odd terminal leaflet, sometimes with only one leaflet, transparently dotted. *Infl.* various. *Fls.* hermaphrodite or unisexual. *Sep.* 3-5, more or less united. *Pet.* 3-5, imbricate or valvate. *Male fls.*: *Disk* inconspicuous. *Stam.* 3-5, hypogynous. *Female fls.*: *Stam.* none or scale-like. *Disk* inconspicuous. *Carp.* 1-5, one-celled; *styles* sublateral; *ovules* 2 in each cell, collateral. *Fruit* of 1-5 cocci. *Seeds* one in each cell, pendulous.

Flower clusters axillary, small.

Leaf rhachis wingless; *sep.*, *pet.* and *stam.* 3.....1. *Z. punctatum.*

Leaf rhachis winged; *sep.*, *pet.* and *stam.* 4.....2. *Z. Fagara.*

Flower clusters terminal, usually large;
sep., *pet.* and *stam.* usually 5.

Leaflet 1.....3. *Z. monophyllum.*

Leaflets 5 or more.

Hairs on the young growth and
branches of the inflorescence
simple.

Rhachis of the leaves hispidulous....4. *Z. martinicense.*

Rhachis of the leaves glabrous....5. *Z. trinitense.*

Hairs on the young growth and
branches of the inflorescence

star-like.....6. *Z. microcarpum.*

1. *Z. punctatum* Vahl.

Z. trifoliatum Wright not of L.

Tobinia punctata Griseb.

Gr. Fl. 137: Fawc. and Rendl. Fl. Jam. 4. 177: Urb. Symb.
Ant. 8. 321: N. Amer. Fl. 25. 182.

Shrub 2-9 m., the leafy branches usually prickly, the flowering ones usually without prickles; leaf rhachis wingless, *lfts.* usually 3, sometimes as many as 13, obovate-elliptical to elliptical-lanceolate.

2-8 cm. long, 1-4 cm. broad, the apex various, the margin slightly toothed, black glandular dots beneath rarely with a few transparent ones; *fls.* in small axillary clusters, shorter than the petioles 1.5 cm. long; *sep.* 3, less than 1 mm. long; *pet.* 3, white or yellowish white, 1.8-2.3 mm. long; *stam.* 3; *carps.* 2; *cocci* 2 or 1, globular, 3.5-4 mm. long.

Not seen. (314 Sieber ex Urb.) Not otherwise known from Trinidad.

West Indies.

2. **Z. Fagara** Sarg.

Fagara lentiscifolia H.B.K.

Fawc. and Rendl. Fl. Jam. 4. 175: N. Amer. Fl. 25. 190.

Shrub or small *tree*, the stems with recurved stipular prickles; *lvs.* 3-10 cm. long, *lfts.* 5-13, obovate to roundish or elliptical, 8-20 mm. long, the terminal one larger, the margin slightly toothed and with transparent dots mostly below the teeth, petiole and rhachis winged; *fls.* in spike-like racemes, solitary or few in the axils; *fls.* dioecious; *male fls.*: *sep.* 4, triangular above, about 1 mm. long; *pet.* 4, oblong or oblong-obovate, about 3 mm. long; *stam.* 4, longer than the petals; *pistil* about 1.5 mm. long; *female fls.*: *sep.* 4; *pet.* smaller than in the male, whitish; *carps.* 2, raised on a two-branched column; *cocci* 1 or 2, subglobose, 3-4 mm. diam., minutely glandular dotted; *seeds* globose, shining black, 2-3 mm. diam.

Monos and Chacachacare, Gasparee, Cedros and Erin. Trinidad. Bahamas, Cuba, Jamaica, tropical and subtropical, continental America.

3. **Z. monophyllum** (Lam.) P. Wilson.

Z. ochroxylum DC.

N. Amer. Fl. 25. 192: Urb.Symb. Ant. 8. 320.

Shrub or *tree* up to 10 m., *branches* unarmed or prickly; *lvs.* with only 1 leaflet, elliptical, acute, obtuse or shortly acuminate, acute or sometimes rounded at the base, 3-14 cm. long, 1.5-5.4 cm. broad, glabrous, with numerous transparent glands, *petioles* 5-15 mm. long, grooved, glandular; *fls.* dioecious, in terminal panicles 2-5 cm. long; *male fls.*: *sep.* 5, rarely 4, triangular; *pet.* white, 5, rarely 4, ovate or ovate-oblong, 2-2.6 mm. long; *stam.* 5, rarely 4, as long as the petals; *female fls.*: *sep.* rather smaller; *pet.* about the same size; *carps.* 2 or 3, subsessile; *styles* short; *cocci* globose or globose-ovoid, 3.5-4.5 mm. long; *seeds* 3-4 mm. long, shining black.

Not seen (286 Sieber, ex Urb.) Not otherwise known from Trinidad; Hispaniola to Trinidad. Costa Rica. Northern South America.

4. *Z. martinicense* (Lam.) DC. L'Epinet.

Z. Clava-herculis Sw. not L. : *Z. juglandifolium* Willd.

N. Amer. Fl. 25. 194 : Fawc. and Rendl. Fl. Jam. 4. 172 :
Urb. Symb. Ant. 8. 320.

Tree 10-20 m. high, the trunk 1 m. or more diam., bearing corky spiny knobs ; *stems* puberulous with simple hairs, armed with straight or somewhat curved prickles or unarmed ; *lvs.* 1-3 dm. long ; *lfts.* 5-19, the terminal one present or absent, sessile or nearly so, oblong, oblong-elliptical, oblong-lanceolate or oblanceolate, 3-13 cm. long, the apex obtuse to shortly acuminate, unequal, rounded or acute at the base, entire or slightly notched, with scattered hairs on both surfaces and glandular dots in the notches on the margin and scattered on the leaves ; *petioles* and *rhachis* hispidulous, usually armed with brownish prickles sometimes with a prickly also on the mid rib beneath ; *fls.* white, dioecious, subsessile, in terminal, rarely lateral panicles 6-15 cm. long ; *sep.* 5, triangular, about 0.5 mm. long ; *pet.* 5, 1.5-2 mm. long ; *carp.* 5 ; *male fls.* : *stam.* 5, exceeding the petals ; *fruit* of 2-5 cocci, ovoid to globose, 5 mm. long ; *seeds* shining black, 3-4 mm. long.

Record and Mell. in "Timbers Trop. America" p. 319 state :
"It is one of the largest trees of the genus sometimes 75 feet high and over 2 feet in diam. with a reddish-yellow, somewhat streaked wood useful for furniture, cabinet work and building construction."

Herb. Trin. 3065, Cedros and 8703 Tabaguite, Trinidad.
West Indies and Northern S. America.

5. *Z. trinitense* sp. nov.

A tree, *branches* unarmed ; young *twigs* and *branches* of the panicles puberulent, the hairs simple ; *lvs.* 18-28 cm. long, with or without an odd terminal leaflet ; *petioles* and *rhachis* glabrous, *lfts.* 7-11, ovate-lanceolate to oblong-lanceolate, 5.5-10 cm. long, 2.7-4 cm. broad, more or less inequilateral and rounded at the base, long-acuminate at the apex, entire, glabrous and lustrous on both surfaces ; *infl.* terminal, about 6-9 cm. long and about as broad ; *fls.* not seen ; *sep.* from under follicles 5, broadly triangular, about 0.5 mm. long ; *follicles* 2 or 3, sometimes 4, crowded together ; *seeds* oval or ovoid, 4 mm. long, black, shining.

Herb. Trin. 12244 (type) Russell, Southern Watershed Reserve, Trinidad.

6. *Z. microcarpum* Griseb. L'Epinet.

Gr. Fl. 138 : N. Amer. Fl. 25. 196.

Tree up to 13 m., the trunk armed with large prickles, the young *stems* stellate pubescent ; *lvs.* 1-3 dm. long, *lfts.* 11-20, sometimes more, the terminal one present or absent, mostly oblong

or lanceolate-oblong, acute or acuminate at the apex, acute or obtuse at base, 2.5-9 cm. long, 10-25 mm. broad, somewhat unequal sided, the margin slightly toothed, stellate pubescent on both sides sparsely so above, densely so on the mid-rib beneath, transparent dots scattered and in the notches on the margin, petiole and *rhachis* puberulous, unarmed or occasionally with an odd prickle; *fls.* dioecious, small, in terminal stellate pubescent panicles 10-20 cm. long; *sep.* and *pet.* 5; *carp.* 2-3; *cocci* usually by abortion solitary or two together, subglobose, 4-5 mm. diam. with conspicuous raised glands; *seeds* roundish, shining black, about 3 mm. diam.

Woodlands and hillsides in moist districts, Trinidad.

Guadeloupe to St. Vincent, Costa Rica, Brazil.

DOUBTFUL SPECIES.

Two apparently additional species of *Zanthoxylum* are represented in the Trinidad herbarium by leaves only. In their sterile condition it is not possible to refer them to any described species.

(a) Herb. Trin. 3066, Maracas, Nov., 1861, ex Herb. Crueger and 12246, Sept., 1929, Central Range Reserve, Trinidad; *lfts.* about 7-11, 10-23 cm. long, 5.5-8.5 cm. broad, the margin only slightly and distantly indented or almost entire, glabrous.

(b) Herb. Trin. 12245, Southern Watershed Reserve, Sept. 1929; *lfts.* apparently 13, 14-23 cm. long, 7-8.5 cm. broad, distinctly notched on the margin, glabrous.

3. AMYRIS L.

Shrubs or *trees*, resinous. *Lvs.* alternate or opposite and alternate with an odd terminal leaflet; *lfts.* 1-3 or more with numerous transparent dots. *Fls.* hermaphrodite, numerous, usually in threes, in axillary and terminal panicles. *Cal.* urn-shaped, 4-toothed, persistent. *Pet.* 4. *Stam.* 8. *Ovary* not lobed, one-celled; *ovules* 2, pendulous. *Drupe* globose or ellipsoid, black or reddish, one-seeded.

Lvs. with one leaflet. 1. *A. simplicifolia.*

Lvs. with several leaflets. 2. *A. Elemifera.*

1. *A. simplicifolia* Karst. Torchwood.

A. maritima of Griseb. Fl. 174. in part: N. Amer. Fl. 25. 217.

Shrub or small *tree* up to 5 m., glabrous; *lvs.* alternate or the upper ones nearly opposite, with only one leaflet; *lfts.* ovate, often broadly so, the apex obtusely and shortly acuminate, acute

or somewhat rounded, the base more or less rounded or wedge-shaped, 3-9 cm. long, 2-6 cm. broad, the margin very slightly notched, glabrous and with the veins prominent on both sides and with transparent dots; *infl.* many fld.; *cal.* lobes triangular, about 0.5 mm. long, glabrous; *pet.* white, oblong to obovate, about 3 mm. long, glandular dotted; *receptacle* red; *ovary* ovoid, glabrous; *style* short; *stig.* capitate; *drupe* globose, about 5 mm. diam.

The wood is used for fuel and torches.

Bocas Islands and dry places. Trinidad.
Curacao and Northern South America.

2. *A. Elemifera* L.

A. sylvatica Jacq.

N. Amer. Fl. 25. 218: Fawc. and Rendl. Fl. Jam. 4. 191.

Shrub or *tree* up to 17 m. high and 3 dm. diam., glabrous or minutely hairy; *lvs.* opposite, with 3-5 lfts; *lfts.* lanceolate to broadly ovate or roundish, the apex acute to long acuminate or sometimes rounded, wedge-shaped to rounded at the base, about 3-4 cm. long, 15-25 mm. wide, slightly toothed or entire, somewhat leathery; *cal.* about 0.5 mm. long, the lobes triangular; *pet.* obovate to obovate-elliptical, 2-3 mm. long, glandular dotted; *gynophore* wanting or more or less developed; *ovary* glabrous; *drupe* usually globose, about 5-8 mm. long.

Not seen. Sieber 29, ex Urb. Not otherwise known from Trinidad. Florida, Bahamas, West Indies and Cont. America.

FAMILY 8. HUMIRIACEAE.

Shrubs or *trees*. *Lvs.* alternate, simple, without stipules. *Fls.* regular. *Sep.* 5, imbricate, united partly or entirely. *Pet.* 5, free, soon falling, slightly contorted. *Stam.* 10 to numerous, hypogynous, more or less united below; *anths.* versatile, 2-4 celled, opening lengthwise. *Ovary* free, sessile, 5-7 celled, surrounded at the base by a disk which is often toothed or of separate glands; *style* simple, thread-like; *stig.* entire or minutely toothed; *ovules* 1-3, pendulous. *Fruit* a drupe, the pericarp thin and fleshy, the endocarp hard, sometimes with numerous resin filled cavities. *Seeds* 1-2 in each cell.

1. *SACOGLOTTIS* Mart.

Trees. *Fls.* small, in axillary or lateral stalked cymes. *Stam.* 10; *fil.* shortly united at the base, the connective drawn out into a ligule. *Disk* 5-lobed or 5-parted, the lobes often 2-fid. *Ovary* 5-celled; *ovules* solitary in the cells.

1. *S. amazonica* Mart. Ceret. Cojon de burro.

Large tree with straight trunks; *lvs.* ovate-oblong to elliptical-oblong, abruptly acuminate at the apex, narrowed or rounded at the base, up to 16 cm. long by 6.5 cm. wide, the margin slightly wavy toothed, somewhat leathery, glabrous, the veins prominent on both sides, *petioles* 8-12 mm. long; *infl.* about as long as the petiole; *sep.* about 1 mm. long and 2 mm. broad, minutely fringed; *pet.* oblong, acute or obtuse, 4 mm. long; *staminal cup.* 1 mm. long; *fil.* 5 long and 5 short (2.5 mm. and 1.5 mm.), the connective 1 mm. long, triangular, acute; *style* equal to the longest filaments; (*fruit* dark purplish, ex Broadway), ovate or ellipsoidal, 3.5-5.5 cm. long, 3-4 cm. diam., the *endocarp* with numerous resin-filled cavities; *seeds* about 3 cm. long.

(Circumference of one of the largest trees seen at the time, measured at 4 ft. from the ground 7 ft. 5 in. Boards are made from the trees for house purposes. Somewhat gregarious in Irois Forest. ex Broadway.)

A common drift fruit.

Irois and Chatham, Trinidad.
St. Vincent, Guiana and Brazil.

FAMILY 9. BURSERACEAE.

Shrubs or *trees*, resinous or aromatic. *Lvs.* alternate, imparipinnate, rarely with one leaflet, without stipules. *Fls.* small, hermaphrodite or polygamous-dioecious, usually in panicles or racemes. *Sep.* 3-5, united into a short tube. *Pet.* 3-5, imbricate or valvate. *Disk* free or united to the calyx tube. *Stam.* equalling in number the petals or usually twice as many; *fil.* free; *anths.* 2-celled. *Ovary* superior, 2-5-celled. *Ovules* 2 in each cell, rarely 1. *Fruit* drupaceous, tardily dehiscent, containing 1-5 stones.

Cal. and pet. 4-5 parted.

Stig. 4-5-lobed. *Lvs.* leathery
in the local spp. 1. *Protium*.

Stig. 3-lobed. *Lvs.* membranous
in the local spp. 2. *Bursera*.

Cal. and pet. 3 parted. 3. *Trattinickia*.

1. **PROTIUM** *Burm.*

Trees with balsam-like resin. *Lvs.* pinnate with an odd terminal leaflet; *lfts.* leathery, entire, often with numerous minute transparent dots. *Fls.* in axillary panicles or corymbs, perfect or polygamous. *Cal.* 4-5 lobed. *Pet.* 4 or 5, free, valvate in the bud. *Stam.* 8 or 10. *Ovary* 4-5 celled; *stig.* 4-5 lobed. *Drupe* of 1-5 cocci, each 1-celled and 1-seeded.

- Ovary glabrous; *lfts.* without transparent dots or veins 1. *P. guianense*.
 Ovary pilose; *lfts.* with closely set minute transparent dots, the tertiary veins not transparent 2. *P. insigne*.

1. **P. guianense** (Aubl.) March. White Incense. Incense Wood. Bois d'encens.

Icica guianensis Aubl. Pl. Guiana 340. t. 131.
I. heptaphylla Griseb. in part, not Aubl.
 Urb. Symb. Ant. 7. 241.

Tall forest tree; *lvs.* up to 25 cm. long; *lfts.* 3-7, rarely 9, the lateral ones opposite, ovate, ovate-oblong, or elliptical, the apex acuminate, the base more or less rounded, unequal sided, up to 12 cm. long and 5.5 cm. broad, glabrous, the reticulation not prominent on either side; *fls.* in congested clusters in the axils of the leaves, the clusters much shorter than the petiole; *cal.* shallowly cup-shaped, subentire, puberulous; *pet.* valvate, oblong, acute, 2 mm. long, puberulous; *stam.* 8, shorter than the petals; *fls.* glabrous; *ovary* glabrous, the lobes rather inconspicuous; *style* simple, less than 1 mm. long; *drupe* ovate, acute, of 1-4 cocci, 10-15 mm. long, shortly beaked, glabrous.

A white fragrant resin exudes from cuts made in the bark.

Forests, Trinidad.
 St. Vincent, Guiana.

2. **P. insigne** Engl. Gommier.

Icica insignis Tr. and Pl.
Icicopsis insignis Engl.

Tree 30 m.; *lvs.* up to 50 or more cm. long; *lfts.* usually 9-11, the lateral ones opposite, oblong, abruptly long and narrowly acuminate at the apex, wedge shaped to rounded and unequal at the base, 7-20 or more cm. long, 3-6.5 cm. broad, glabrous, the reticulation fairly prominent on both sides; *fls.* sessile in

spreading panicles 5-18 cm. long, the *panicles* longer than the petiole; *cal.* 1.5 mm. long, cup-shaped, with 5 triangular teeth; *pet.* valvate, lanceolate-oblong, about 2 mm. long; *ovary* brownish pilose; *fruit* of 1-3 cocci, 10-16 mm. long, glabrous or with a few hairs at the base. Heartwood reddish, somewhat similar to that of Crappo, *Carapa guianensis* Aubl.

General in Forests, Trinidad.
Colombia.

2. BURSERA L.

Trees with balsam-like resin. *Lvs.* simple or imparipinnate. *Fls.* small, polygamous, in axillary panicles or racemes, sometimes solitary or few together. *Cal.* small, 4-5 lobed. *Pet.* 4-5, valvate in the bud. *Stam.* twice as many as the petals, inserted at the base of the ring-like disk. *Ovary* 3-celled; *stig.* 3-lobed. *Drupe* more or less 3-angled, splitting into 2-3 valves and containing 3 or sometimes one, bony stones covered with pulp.

Lvs. compound.....1. *B. Simaruba.*

Lvs. simple2. *B. trinitensis.*

1. **B. Simaruba** (L). Sarg. Dry land Gommier, Red Birch,
West Indian Birch, Turpentine Tree.

B. gummiifera L.

Pistacia Simaruba L.

Fawc. and Rendl. Fl. Jam. 4. 205-206.

Tree up to 20 m. high and 1 m. diam., the bark shining reddish-brown and peeling off in thin papery layers; *lvs.* pinnate, 1-2 dm. long composed of 3-7, sometimes more, leaflets; *lfts.* ovate-oblong to elliptical, acuminate at the apex, more or less rounded at the base, unequal sided, up to 13 cm. long, papery, glabrous or nearly so; *infl.* 2.5-10 cm. long; *fls.* white; *cal.* 5-lobed, the lobes about 1 mm. long; *pet.* 5, 2-3 mm. long; *drupe* 5-12 mm. long; *seeds* white, 5-7 mm. long and about the same in diam., 3-angled.

Dry islands or coastal districts, Trinidad.
Florida to Northern S. America.

2. **B. trinitensis** (Rose) *comb. nov.*

Elaphrium trinitense Rose.

Bull. Torr. Bot. Club. 48. 333.

Gnarled *tree*, 5 m. high, fragrant, branches glabrous often short and spur-like with brownish bark; *lvs.* simple borne at the ends of stubby branches, broadly ovate, rounded at both

ends, often minutely apiculate at the apex, 2.5 cm. long or less, entire, glabrous, petiole not winged, 12 mm. long or less; *fls.* solitary or in small panicles, sometimes only 3 or 4 flowered; *pedi.* 3-5 mm. long, glabrous; *fruit* 3-angled, glabrous, 8-10 mm. long; *stone* white, 3-angled.

2739, Britton, Britton and Brown, Rocky Point, Western end of Monos Island, Trinidad.

3. TRATTINICKIA Willd.

Trees with balsam-like resin. *Lvs.* alternate, pinnate, with an odd terminal leaflet; *lfts.* opposite, entire, hard and leathery. *Fls.* polygamous, shortly pedicellate. *Cal.* cup-shaped, 3-lobed, imbricate. *Cor.* tubular, 3-lobed, the lobes valvate. *Disk* perigynous, ring-like. *Stam.* 6, inserted on the base of the disk, very short. *Ov.* ovoid, 2-celled, acute; *style* very short; *stig.* capitate, 2-lobed; *ovules* 2 in each cell. *Drup:* 2-celled, globose-ovoid, not valved, very hard.

1. *T. rhoifolia* Willd.

Tree: *lvs.* 2.5-3.5 dm. long, the rhachis angled, petiole semiterete, flattened above; *lfts.* about 9, the pairs distant, oblong-elliptical, 10-15 cm. long, 3.5-5.5 cm. broad, truncate, rounded or somewhat narrowed at the base, narrowed towards the apex and rather abruptly acuminate, the point 1-2 cm. long, glabrous, the lateral veins very prominent beneath, *petiolules* 5-10 cm. long, transversely wrinkled; *panicles*, 10-20 cm. long, the main, secondary and tertiary branches angular and pubescent; *fls.* numerous, congested; *cal.* lobes narrow, 1.5 mm. long; *cor.* leathery, the tube 1.5 mm. long, the lobes 1.5 mm. long and broad, concave at the apex; *anths.* obtuse; *disk* 1 mm. broad, deeply grooved; *ovary* 1 mm. long, glabrous; *fruit* bony, about 1.5 mm. long, globose-ovoid, acute, irregularly warty.

Herb. Trin. 2656, La Brea (1866), Trinidad.
Brazil.

FAMILY 10. SIMAROUBACEAE.

Shrubs or trees, the bark usually bitter. *Lvs.* alternate, pinnate. *Stip.* none. *Fls.* small, monoecious, dioecious or polygamous, axillary, solitary or in panicles or racemes. *Cal.* 3-5 lobed or parted, imbricate. *Pet.* 3-7, rarely none, imbricate or valvate. *Stam.* free, inserted at the base of the disk, as many as the petals, or twice as many, rarely numerous; *anths.* turned inwards with longitudinal dehiscence. *Carps.* 2-5, free or united; *styles* free, united or wanting. *Ovules* usually 1 or 2 in each cell. *Stig.* scarcely lobed. *Fruit* a drupe, berry, capsule or samara. *Seeds* usually solitary.

- Petioles and leaf rhachis prominently winged.....1. *Quassia*.
 Petioles not winged.
 Ovary deeply lobed or parted.
 Stigmas united.....2. *Simaba*.
 Stigmas free.....3. *Simarouba*.
 Ovary entire.....4. *Picramnia*.

1. QUASSIA L.

Trees, the wood bitter. *Lvs.* alternate, pinnate, with or without a terminal leaflet. *Fls.* red, perfect, in terminal racemes or panicles. *Sep.* 5, free, deciduous. *Pet.* 5, free, much longer than the sepals. *Stam.* 10, inserted at the base of the disk; *fil.* long and slender with short appendages. *Ovary* deeply 5-lobed, immersed in the disk; *styles* united. *Drupe* 5, spreading, short.

1. *Q. amara* L. Quassia. Bitterwood.

N. Amer. Fl. 25. 299.

Small tree; *lvs.* 1.5-3 dm. long, with usually 5 leaflets, the petiole, rhachis and mid-rib of the leaflets red, the petiole and rhachis prominently winged; *lfts.* oblanceolate, obovate or elliptical, the apex acuminate, the base more or less wedge-shaped, 7-16 cm. long, 2-6.5 cm. broad, membranous, glabrous; *fls.* in racemes 1-3 dm. long, the rhachis red; *sep.* red, about 2 mm. long, ovate, obtuse, minutely fringed; *pet.* red outside, pale within, linear or linear-lanceolate, about 3.5 cm. long, glabrous; *stam.* all longer than the corolla, the 5 long about 4.5 mm. long, the 5 short 4 mm. long; *fil.* red with a small, white, hairy appendage

at the base; disk 2 mm. long; style 4.3 cm. long; drupes ellipsoid or obovoid, 1-1.5 cm. long, quite free from each other on the fleshy red disk.

The wood is of value medicinally, being one of the sources of Quassia chips used for medicine and insecticides.

Hillsides in moist districts, Trinidad.

Northern South America: cultivated and naturalized in Mexico Central America and the West Indies.

2. *SIMABA* Aubl.

Shrubs or trees. Lvs. with a terminal leaflet, entire, leathery. Fls. hermaphrodite, in panicles. Cal. small, 4-5 lobed. Pet. 4-5, much longer than the calyx, slightly united at the base, the lobes narrow, valvate. Disk erect, 4-5 lobed. Stam. 8 or 10, inserted at the base of the disk; fil. with appendages. Ovary 4-5 lobed, the carpels more or less united; ovules solitary; styles united above; stig. slightly lobed. Drupes 4-5.

Simaba Cedron Planch, the Cedron, native of Costa Rica, Colombia and Guiana, the wood and bark of which has bitter and tonic properties is sometimes seen as a cultivated plant.

1. *S. multiflora* Juss.

S. foetida Benth.: *S. orinocensis* Gr. Fl. 139, non H.B.K.: *S. guianensis* var. *Schomburgkiana* Engl.

Kew Bull. 1929. pp. 79-81.

Tree; lvs. about 2 dm. long with 3-7 leaflets; lfts. distant, spatulate, obtuse at the apex, usually very shortly cuspidate, sometimes emarginate, gradually narrowed to the base, 4-9 cm. long, 15-30 cm. wide, glabrous and with lateral veins impressed on both sides, glaucous beneath; panicles usually long and conspicuous; pet. becoming reflexed; appendage of filaments triangular-obcordate, villous-hairy at the top, less than 1 mm. long, and about one-third as long as the glabrous filament; disk conspicuous, strongly whitish-pubescent, more than 1 mm. long and broad; fruit somewhat oblong-ovoid, developed more on one side than on the other, 15 mm. long, 12 mm. broad (? mature).

This species was confused by Grisebach with *S. orinocensis* H.B.K., which has a glabrous gynophore and different fruit, and by Engler in the *Flora Brasiliensis* with *S. guianensis* Aubl. Aublet's types have been examined at the British Museum, and prove to represent a totally different plant, at present known only from French Guiana. *S. multiflora* occurs over wide areas in Guiana

and Brazil. The obovate leaflets are usually very shortly cuspidate at the apex, but they are frequently rounded, and sometimes even emarginate (*S. foetida* Benth.)

Herb. Trin. 6943, Dannouse, Aripo, Forests in wet or moist districts, Trinidad.

St. Vincent, Trinidad, Guiana, Brazil.

3. SIMAROUBA Aubl.

Trees. *Lvs.* alternate, pinnate, with or without an odd terminal leaflet. *Fls.* small, dioecious or monoecious, in axillary and terminal, long, much branched panicles. *Cal.* 5-lobed. *Pet.* 5-lobed, imbricate. *Male fls.*: *Stam.* 10, inserted at the base of the disk, shorter than the petals; *fil.* provided with a short scale at the base within. *Female fls.*: *Staminodes* scale-like. *Ovary* deeply 5-lobed; *styles* united; *stigma* spreading or recurved; *ovules* solitary in the cells, pendulous. *Drupe* 1-5.

1. *S. amara* Aubl. Marouba.

Aubl. Pl. Guiana 2. p. 859, t. 331, 332: Gr. Fl. 139.

Lfts. usually oblong and mucronate at the apex, 4.5-12 cm. long, 2.3-5 cm. broad, glabrous, the lateral veins numerous and united near the margin; *panicles* 3 dm. long or more; *fls.* numerous, mostly clustered on the branches of the panicles; *cal.* 0.5-1 mm. long, the lobes somewhat rounded or triangular, acute, minutely fringed; *pet.* ovate to lanceolate, about 2.5 mm. long; *male fls.*: *stam.* about 1.5 mm. long, the scales densely villous; *ovary* sterile, rounded, depressed, grooved vertically, covered with the scales of the filaments; *style* and *stigma* wanting; *female fls.* not seen.

The wood is used in Grenada for boards and shingles.

Dannouse, Guapo, Aug. 1904. D. Alexander, Arima, 1918, Trinidad.

Herb. Trin. 12278, Tobago.

Lesser Antilles, Guiana, Brazil.

4. PICRAMNIA Sw.

Shrubs or *trees* often very bitter. *Lvs.* alternate, pinnate with an odd terminal leaflet. *Fls.* small, dioecious, in spikes or racemes opposite the leaves, pendulous. *Cal.* 3-5 lobed. *Pet.* 3-5, rarely none, linear, imbricate. *Male fls.*: *Stam.* 3-5, opposite the petals, inserted under the disk. *Female fls.*: *Stam.* reduced to staminodes. *Ovary* 2-3 celled; *ovules* 2 in each cell, pendulous; *stigmas* 2-3, spreading. *Fruit* a berry, 1-2 celled, the cells 1-seeded.

Berries obovoid. 1. *P. antidesmoides*.

Berries oblong-ovoid or ovoid. 2. *P. pentandra*.

1. *P. antidesmoides* Gr.

Gr. Fl. 140.

Twigs pubescent; *lvs.* about 20 cm. long, *lfts.* 5-7, lanceolate-elliptical, acuminate at the apex, 5-10 cm. long, 2.5-4 cm. broad, papery, glabrous, the nerves and reticulation conspicuous on both sides; *petioles*, *rhachis* and *petiolules* pubescent; *fls.* in pendulous slender racemes or panicles 15-20 cm. long; *sep.* linear or lanceolate, about 1 mm. long, puberulous; *pet.* 5, linear; *berries* obovoid, rounded at the top, tapering to the base, 10-15 mm. long, smooth, shining, glabrous; *seeds* 6-8 mm. long, wrinkled or warty.

This species is regarded by Small in N. Amer. Fl. and Fawc. and Rendl. in Fl. Jam. as conspecific with *P. pentandra* Sw. There is, however, a very striking distinction in the shape of the fruit.

Forests in moist districts Trinidad. Endemic.

2. *P. pentandra* Sw.

Britt. and Wils. Sc. Surv. Porto Rico, 5. 461: Urb. Symb. Ant. 8. 327.

Small tree; the *branches* pubescent; *lvs.* up to 23 cm. long, *lfts.* 5-9, ovate, oblong or elliptical, obtuse, acute or acuminate at the apex, rounded or more or less wedge-shaped at the base, 12 cm. long and 5.5 cm. broad or less, papery, glabrous or minutely puberulous when young, the nerves and reticulation prominent on both sides, the *petioles*, *rhachis* and short *petiolules* pubescent; *fls.* in pendulous panicles, up to 30 cm. long, loosely branched; *sep.* 5, triangular, acute, about 1.5-2 mm. long, puberulous; *pet.* linear-lanceolate, about 2 mm. long; *stam.* 5; *berries* red, oblong, or ovoid-oblong, 8-16 mm. long, 6-10 mm. broad, smooth, shining, glabrous; *seeds* about 6-8 mm. long, warty.

The wood is said to be hard, fine-grained and heavy. Trinidad, ex Urb.: Hillsides in moist districts, Tobago. Florida, West Indies.

FAMILY 11. MELIACEAE.

Trees or *shrubs* often having hard coloured, durable, sometimes sweetly scented timber. *Lvs.* alternate, without *stipules* and usually without transparent dots or lines, pinnate or palmately compound; *lfts.* entire. *Fls.* small, in axillary or terminal panicles or racemes, hermaphrodite or rarely polygamo-dioecious, regular. *Sep.* 4-5, united or free, imbricate, rarely valvate. *Pet.* 4-5, rarely 3-7, imbricate or valvate, free or sometimes united to the lower part of the staminal tube. *Stam.* 8-10 (in *Cedrela* 5),

the *filaments* inserted outside the base of the disk, united into a tube, or, in *Cedrela*, to the columnar disk; *anths.* sessile or shortly stalked. *Disk* various, ring-like or columnar, free or united to the ovary or staminal tube. *Ovary* 2-5 celled; *ovules* 2-numerous in each cell; *styles* united. *Fruit* a capsule in the local spp. *Seeds* solitary or numerous, sometimes winged, with or without *arils*.

Swietenia mahagoni Jacq. the West Indian Mahogany and *S. macrophylla* G. King, the British Honduras Mahogany, are both planted in Trinidad and Tobago for timber purposes.

Melia Azedarach L. the West Indian lilac, is also cultivated as an ornamental tree.

Seeds winged. 1. *Cedrela*.

Seeds not winged.

Seeds with arils.

Capsule usually 3-valved. 2. *Trichilia*.

Capsule 4-valved. 3. *Guarea*.

Seeds without arils. 4. *Carapa*.

1. CEDRELA L.

Tall trees with soft, coloured wood. *Lvs.* pinnate with many pairs of opposite or subopposite leaflets and without a terminal leaflet. *Fls.* small, in large terminal panicles. *Cal.* small, 5-lobed. *Pet.* 5, erect, imbricate, more or less keeled inside by which means they are attached to the column. *Disk* thick or elevated and columnar, 4-6 lobed. *Stam.* 4-6; *fil.* joined to the columnar disk below, free above, inserted on the edge of the disk, sometimes alternating with staminodes. *Ovary* 5-celled, sessile on the top of the disk; *stig.* disk-like; *ovules* pendulous, in two series, 8-12 in each cell. *Caps.* leathery, 5-celled, septicidally 5-valved from the apex, the valves in two layers, separating from the persisting 5-winged axis. *Seeds* pendulous, winged.

1. *C. mexicana* Roem. West Indian Cedar. Red Cedar. Acajou.

N. Amer. Fl. 25. 293.

Tree 27-40 m. high and up to 3 m. diam. with soft and porous, reddish-brown, scented wood; *lvs.* 4-6 dm. long, with about 10 pairs of leaflets; *lfts.* unequal-sided, lanceolate, ovate-lanceolate or oblong, acuminate at the apex, more or less rounded at the base, up to 16 cm. long and 6 cm. broad, glabrous, membranous; *panicles* loosely branched, 2-3 dm. long; *cal.* 1.5 to 2 mm. long, puberulous, shallowly lobed, the lobes mostly triangular; *pet.* oblong, 5-6 mm. long, 1.5-2 mm. broad, densely pubescent outside, puberulous with longer hairs inside; *fil.* slender, glabrous; *ovary*

and *style* glabrous or nearly so; *style* 1-1.5 cm. long; *caps.* oblong to elliptical-oblong, 4 cm. long, 2 cm. broad; *seeds* samara-like, 12-25 mm. long including the wing.

The wood of this tree is much used for boards, furniture and cigar boxes as it is immune to insect damage.

This species has been confused with *C. odorata* L. a Jamaican tree.

Hillsides, roadsides and cultivated land, Trinidad. Tobago.
Mexico, Central America, West Indies and Venezuela.

2. *TRICHILIA* L.

Trees or *shrubs*. *Lvs.* alternate, pinnate with or without a terminal leaflet, palmately 3-foliolate or rarely with one leaflet. *Lfts.* opposite or alternate, usually with minute transparent dots. *Fls.* hermaphrodite. *Sep.* 4-5, free or united, small, valvate. *Pet.* 4-5, imbricate or valvate. *Stam.* 8-10; fil. broad, more or less united into a tube; *anths.* exerted. *Disk* annular. *Ovary* 2-3 celled, more or less immersed in the disk. *Ovules* 2 in each cell, sometimes one; *stig.* capitate, 2-3 lobed. *Fruit* a sub-globose, leathery capsule, 2-3 celled and 2-3 valved, loculicidally dehiscent from the apex. *Seeds* 1-2 in each cell, enclosed in a fleshy aril.

Fls. in short congested panicles shorter than the petiole.

Lvs. palmately 3-foliolate.....1. *T. trifolia*.

Lvs. pinnate usually with a terminal leaflet.

Lfts. glabrous.....2. *T. simplicifolia*.

Lfts. hairy at least on the mid-rib beneath.....3. *T. trinitensis*.

Fls. in elongated panicles exceeding the petiole.

Ovary yellowish woolly.....4. *T. oblanceolata*.

Ovary glabrous.....5. *T. voraiana*.

1. *T. trifolia* L.

N. Amer. Fl. 25. 279.

Shrubs or *trees* 3-7 m.; *lvs.* palmately 3-foliolate, 3-10 cm. long; *lfts.* broadly obovate to elliptical, rounded or obtuse at the apex, more or less wedge-shaped at the base, 2-6 cm. long, 1-4 cm. broad, the terminal leaflet usually much larger than the lateral ones, glabrous, papery; *panicles* axillary, congested, shorter than the petiole; *fls.* subsessile; *cal.* cup-shaped, 1-2 mm. long with 4 or 5 teeth; *pet.* white, elliptical-oblong to oblong-obovate; 4-5 mm. long, 1-2 mm. broad, erect, glabrous; *stam.* 2.5 mm. long, united to about the middle, woolly inside, puberulous outside;

ovary covered with long straight hairs; style 1.5 mm. long; caps. ovoid or subglobose, 6-8 mm. long, glabrous or somewhat hairy; seeds yellowish brown, 3.5-5 mm. long, aril scarlet.

Chacachacare and Patos. Leeward, Tobago.
Cuba, Mexico, Nicaragua, Curacao and Venezuela.

2. *T. simplicifolia* Spreng.

Pholacilia diversifolia (A. Juss.) Griseb.

Gr. Fl. 130: N. Amer. Fl. 25. 282.

Small medium-sized tree; *lvs.* 15-28 cm. long, pinnate with 3-5 leaflets, rarely only 1; *lfts.* elliptical or broadly obovate, the apex acuminate, the base unequal, wedge-shaped or somewhat rounded, 9-24 cm. long, 4-13 cm. broad, *petioles* and *rhachis* pubescent; *infl.* axillary; *pedi.* long, jointed at the top; *cal.* puberulous, the lobes triangular; *pet.* elliptical, 4.5-5 mm. long, puberulous outside; *fil.* oblong, distinct to the base, hirsute above especially within; *anths.* more or less hirsute; *ovary* hirsute; *caps.* 10-14 mm. long, velvety to nearly glabrous.

Not seen. Mountain woods, Purdie, ex Griseb. Otherwise unknown from Trinidad.

Martinique, Guadeloupe, Dominica; Haiti ex Griseb.

3. *T. trinitensis* Juss. Obie.

Pholacilia trinitensis Griseb.: *T. brachystachya* Kl. ex C. DC.
Fedde Rep. 17. 159. (1921).

Small tree, 3.3 m. high; *lvs.* 10-24 cm. long, pinnate with an odd terminal leaflet, the 1-3 pairs of lateral leaflets opposite or subopposite; *lfts.* ovate, elliptical, elliptical-oblong or obovate, the apex abruptly and obtusely pointed, the base unequal, wedge-shaped to rounded, 2.5-18 cm. long, 1.5-6 cm. broad, the terminal one largest, the mid-rib pubescent above, and with spreading hairs at least on the mid-rib beneath, papery; the *petiole* and *leaf-rhachis* almost woolly; *fls.* green, fragrant, in short congested panicles 1.5-2 cm. long, much shorter than the *petiole*; *sep.* ovate or triangular, about 1 mm. long, woolly outside; *pet.* oblong or elliptical, 3-4 mm. long, puberulous outside; *stam.* 2.5 mm. long, united to about the middle with long whitish wool within; *ovary* and *style* with stiff long erect hairs; *caps.* ovoid or ellipsoidal, 7-10 mm. long, woolly and densely covered with soft prickles.

Maraval, St. Ann's, Guanapo, Common in Southern Watershed Reserve, Trinidad.

Venezuela, B. Guiana, Surinam.

4. *T. oblanceolata* Rusby. Acurel, Mori Cyp.*T. Cruegeriana* Urb.

Three hundred new species of S. Amer. Plants p. 36. (1920): Fedde. Rep. 17. 158 (1921).

Tree; lfts. 7-9, alternate, ovate, ovate-elliptical to elliptical-oblong, the apex acuminate, the base somewhat or scarcely narrowed, 7-17 cm. long, 2.5-6.5 cm. wide, leathery with age; *panicles* axillary, up to 20 cm. long, including the peduncle, puberulous; *petio.* flattened; *sep.* more or less truncate, minutely apiculate; *pet.* ovate-oblong, somewhat obtuse at the apex, 4.5 mm. long, powdery hairy on the back; *staminal tube* about 1 mm. long, shortly pilose within; *anths.* usually 10, subsessile, alternating with as many filiform teeth; *ovary* subglobose, broadest at the base, yellowish woolly; *style* thick, 0.5 mm. diam.; *stig.* peltate; *fruit* ovoid-acute, up to 2.8 cm. long and about 1.5-2 cm. diam., 3-valved, nearly smooth and glabrous except near the torus; *seeds* 1 (in those examined), about 2 cm. long, surrounded by a red aril.

The wood is of fine grain and pinkish when first cut. It takes a good polish and is suitable for furniture and cabinet work.

T. oblanceolata has frequently been confused with *T. moschata* Sw = *Moschoxylum Swartzii* Juss. a Jamaican plant. The latter species, however, apart from different floral characters, has a woolly fruit.

General in forests, Trinidad.
Colombia.

5. *T. roraimana* C.DC.

Small tree, lvs. about 45 cm. long; lfts. elliptical or elliptical-oblong, or the terminal one obovate, the apex acuminate, the base more or less wedge-shaped, 10-18 cm. long, 3.5-7.5 cm. broad, glabrous on both sides, very thin; the *petioles* and *rhachis* angled; *panicles* at the tops of the branches, pubescent, up to 18 cm. long; *fls.* sessile or subsessile; *sep.* triangular, about 1 mm. long, puberulous, minutely fringed; *pet.* ovate, acute or obtuse, 2 mm. long, minutely puberulous outside; *stam.* 1.5 mm. long; *fil.* flattened, densely whitish woolly above; *ovary* pyramidal, 1 mm. long, glabrous; *stig.* sessile or subsessile; *fruit* 1.5 cm. long, adpressed yellowish-silky, 3-valved; *seeds* black, ovoid, 12 mm. long, surrounded by a red aril.

Herb. Trin. 9063, Freeman and Britton, Tucuche: Herb. Trin. 11243, R. O. W., W. G. F. and E. E. C., Road to Maracas Bay, Trinidad.
British Guiana.

3. GUAREA L.

Trees or shrubs. Lvs. pinnate without an odd terminal leaflet; *lfts.* usually opposite or subopposite with minute transparent dots or lines. *Fls.* hermaphrodite, in axillary panicles. *Cal.* cup-shaped, 4-5 toothed. *Pet.* 4 or 5. *Staminal tube* cylindrical or angled, entire or 8-12 lobed; *anths.* 8-12, included in the tube or barely exerted. *Disk* obsolete or stalk-like. *Ovary* usually 4-celled, sessile or stalked with the disk; *stig.* rounded; *ovules* 1 or 2 in each cell. *Caps.* leathery or woody, 4-celled, loculicidally and tardily dehiscent from the apex. *Seeds* 1 or 2 in each cell, each enclosed with an aril.

Lvs. puberulous on the nerves beneath

and bearded in the axils of the nerves 1. *G. glabra.*

Lvs. glabrous beneath. 2. *G. trichilioides.*

1. *G. glabra* Vahl. Redwood. Karimbo.

G. Swartzii DC. of Griseb. and Fawc. and Rendl., not of N. Am. Fl.

Fawc. and Rendl. Fl. Jam. 4. 214: N. Amer. Fl. 25. 267.

Tree, lvs. up to 4 dm. or more long with 2-5 pairs of leaflets, *lfts.* usually elliptical or oblong, the apex usually abruptly acuminate, 10-20 cm. long or sometimes 30 cm., glabrous above, puberulous on the nerves and bearded in the axils of the nerves beneath; *panicles* about 10-15 cm. long, loosely flowered, the branches hairy; *pedi.* 2-4 mm. long; *cal.* 1-2.5 mm. long, minutely 4-toothed, puberulous; *pet.* white, 4 or 5, oblong, obtuse at the apex, 5-7 mm. long; *staminal tube* glabrous or puberulous, 4 mm. long the *stamens* inserted within, not or barely exceeding it; *ovary* glabrous; *style* glabrous, about 2 mm. long; *caps.* globose, 1-2 cm. diam., roughened when dry, *aril* scarlet.

The Jamaican plant is separated by P. Wilson in N. Amer. Flora as a distinct species, *G. Swartzii* DC., although Fawc. and Rendl. have not regarded it as distinguishable from Vahl's plant.

Maracas, Long Stretch, Monkey Town, Chaguanas, Rio Claro, Siparia, Trinidad.

Lesser Antilles and N. South America.

2. *G. trichilioides* L. Redwood.

Guarea Guara (Jacq.) P. Wilson.

Melia Guara Jacq.

Tree, lvs. 1-5 dm. long, with 4-10 pairs of opposite leaflets; *lfts.* usually elliptical or oblong, the apex obtuse, acute or abruptly and obtusely pointed, wedge-shaped and unequal at the base, 8-24 cm. long, 2.5-7.5 cm. broad, glabrous on both sides; *panicles*

10-40 cm. long, or even longer; *cal.* minutely toothed; *pet.* oblong, 5-7.5 mm. long, densely pubescent; *staminal tube* glabrous or puberulous, entire or slightly lobed; *ovary* sessile on a raised disk, pubescent; *caps.* broadly obovoid, 1-2 cm. diam., glabrous, thickly marked with lenticellate dots.

Diego Martin, Maraval, Arima, Siparia, Trinidad.
Cuba, Hispaniola, Porto Rico, Cont. Trop. America.

4. CARAPA Aubl.

Trees. *Lvs.* alternate, pinnate usually without an odd terminal leaflet. *Fls.* small, hermaphrodite, in terminal or axillary panicles. *Sep.* 4-5, imbricate. *Pet.* 4-5, free, reflexed, contorted. *Staminal tube* urn-shaped, 8-10 lobed, lobes entire or bifid; *anths.* sessile within the tube. *Disk* fleshy. *Ovary* 4-5 celled, 4-5 grooved or ribbed, sessile on the disk; *style* short; *stig.* disk-like; *ovules* in two series, 2-8 in each cell. *Caps.* large, subglobose or ovoid, woody or fleshy, the cells 1-5 seeded. *Seeds* large, angled.

1. *C. guianensis* Aubl. Crappo. Crabwood. Crapeau. Crapaud.
Carap.

Aubl. Pl. Guiana, Supp. 32 t. 387; N. Amer. Fl. 25, 289.

Trees up to 30 m. high and 1 m. diam.; *lvs.* very large, 3-5 dm. or more long, with 4 to 7 pairs of opposite or subopposite leaflets; *lfts.* oblong, ovate-oblong or elliptical-oblong, the apex acute and often mucronate, the base unequal, wedge-shaped to rounded, 12-25 cm. long, 5-8 mm. broad, shining above, glabrous on both sides, leathery; *panicle* 3 dm. or more long, glabrous; *fls.* subsessile; *sep.* 4, rounded, about 1 mm. long, glabrous; *pet.* 4, white, broadly obovate or elliptical, about 5 mm. long, glabrous; *staminal tube* about 3 mm. long; *ovary* 4-celled, glabrous; *style* about 1 mm. long, glabrous; *stig.* about 1 mm. broad; *fruit* 4-angled, 7-10 cm. broad, *seeds* about 12, 3.5-5 cm. diam.

The wood is reddish, durable, easily worked and is suitable for furniture, house construction, &c. The seeds yield over 50 per cent. of a bitter dirty brown oil which may be obtained by crushing and exposing to the sun on an inclined tray. The oil is useful medicinally for skin diseases, wounds, &c., for treating wood to repel insect attacks, for burning, and for soap and candle manufacture.

Forests in wet or moist districts. Trinidad.

Santo Domingo, Martinique, Guadeloupe, Dominica, St. Vincent, Northern South America.