

Department of Agriculture

TRINIDAD AND TOBAGO.

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VOL. I.]

[PART I.

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FLORA  
or  
Trinidad and Tobago.

RAÑALES

BY

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Superintendent, Royal Botanic Gardens and Assistant Botanist.

Price One Shilling.



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## PREFACE.

*The preparation of the Flora of a country is almost invariably the work of many persons during many years. That of Trinidad and Tobago, of which this, the first portion, is now issued, is no exception. Several botanists and collectors did yeoman work in the early part of the last century, notably the first three Superintendents of the Botanic Gardens, Lockhart 1816-46, Purdie 1846-57 and Crueger 1857-64 and enthusiastic local amateurs such as Fendler, Bradford, &c., and other botanists, e.g. : Sieber, De Schach and Lane. Much of the results of their work found its place in Grisebach's "FLORA OF THE BRITISH WEST INDIAN ISLANDS" published in 1864. Many additions to our knowledge have been made since those days, but Grisebach's Flora, necessarily incomplete and long out of print, is still the only publication in which information on the native plants of the Colony is readily accessible.*

*After Crueger's time the Herbarium of the Royal Botanic Gardens got into bad condition, as can so easily happen in the tropics without constant attention and to Hart is due the credit of rescuing the valuable collections from destruction. He, together with Broadway, made many further additions to the Herbarium and also generally put it into systematic order. Since that time the Herbarium has been maintained in good condition largely due to the unremitting care of Miss P. McLean, Herbarium Assistant for 35 years. It has grown considerably in size due to the efforts of many collectors principally Williams and the writer.*

*During the last half century or more constant assistance has been received from the Royal Botanic Gardens, Kew, to which great institution our specimens were sent for determination.*

*At the time of the re-organisation of the Department of Agriculture in 1920, much, however, remained to be done, as in the Herbarium were the accumulations of many years, and the realization of the long cherished hope of being able to produce a Flora still seemed very remote.*

At this stage Dr. N. L. Britton, Director-in-Chief of the New York Botanical Garden, decided to come to Trinidad to study our Flora as a part of that of Northern South America, a work on which was contemplated. He and other botanists, including Mrs. Britton, spent two winters here, 1920 and 1921, and not only collected with his extraordinary zeal, but undertook the laborious task of working right through our Herbarium and checking determinations, partly whilst here and with the help of various specialists after return to Bronx. As the outcome he presented a MS. copy of "A PROVISIONAL LIST OF THE PLANTS OF TRINIDAD," which has been of great value.

A start was then made to write up the Flora and with the kind assistance of Dr. Hill, Director of the Royal Botanic Gardens more definite arrangements than heretofore have now been made and the help of a member of the Kew Herbarium Staff obtained to check the manuscript and decide doubtful points. Dr. Hill himself has also given advice and criticism of much value.

It is proposed to publish the work in parts as completed and those now ready are Part I of Vol. I containing the RANALES and Part I of Vol. II containing the RUBIALES.

There is unfortunately no officer of the Department who can devote all or even any considerable portion of his time to the work, desirable as it is to have a Flora, for general information, at times for questions of economic interest, and for the use of the Forestry Department, the staff and students of the Imperial College of Tropical Agriculture and the science pupils in the secondary schools of the Colony.

As an example of the use for economic purposes of the accumulated knowledge of the flora of the Colony it may be stated that in 1926-27 one hundred and nine sets of material were received and dried for the Forestry Department alone. Generic determinations were given them in one hundred and three cases and specific determinations also in eighty-eight. Duplicates of these named specimens were subsequently presented by the Forestry Department to the School of Forestry of Oxford University.

*That so much has been possible is due to the zeal and hard work of Mr. R. O. Williams the present Superintendent of the Gardens and Assistant Botanist, who with the Rubiales and the Malvales (in MS.) has had the valuable co-operation of Professor Cheesman of the Imperial College. The former spent two months in 1926, on this work at Kew, where he received from Mr. T. L. Sprague assistance for which we are greatly indebted.*

*It is to be hoped that now a start has been made of raising the edifice, the foundational work of which has entailed such long and laborious preparation, the completion of the building will not be subject to any undue delays, that it will prove of great utility and that others will be encouraged to add to its completeness.*

W. G. FREEMAN,  
*Director of Agriculture and  
Government Botanist.*

17th June, 1928.

# DICOTYLEDONS.

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## GROUP 1. POLYPETALAE.

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### COHORT 1. RANALES.

BY

R. O. WILLIAMS.

Woody plants, not aquatic.

Lvs. opposite, compound.....1. Ranunculaceae.

Lvs. alternate, simple.

Lvs. pinnately veined.

Sep. 5, imbricate.....2. Dilleniaceae.

Sep. 3, valvate.....3. Annonaceae.

Lvs. palmately veined.....4. Menispermaceae.

Aquatic herbs.

Carps. distinct, not borne on a fleshy receptacle ;

lvs. cauline of two kinds, the submerged ones

finely dissected.....5. Cabombaceae.

Carps. united, immersed in a fleshy receptacle ;

lvs. of one kind, mostly floating, arising

from a stout submerged rootstock.....6. Nymphaeaceae.

## FAMILY 1. RANUNCULACEAE.

Mostly *herbs*, the local species a perennial *climber*. *Lvs.* alternate or opposite, simple or compound, their stalks dilated at the base. *Sep.* often petal-like, usually caducous. *Pet.* often 0. *Stam.* numerous. *Carp.* numerous, 1-celled.

## 1. CLEMATIS L.

*Lvs.* opposite, usually ternate or pinnate. *Fls.* in panicles, dioecious or polygamo-dioecious. *Sep.* 4 or 5, valvate. *Stam.* spreading. *Achenes* numerous, 1-seeded, terminated by long feathery styles.

1. *C. caracasana* DC.

*C. brasiliensis* DC. : *C. caripensis* H.B.K. : *C. dioica* var. *brasiliensis* Eichl.

Gr. Fl. 1 : Mart. Fl. Bras. 13.1.148.

A slender *vine*, the young stems somewhat pubescent ; *lfts.* usually 5, ovate, acuminate, 3.5-6 cm. long, 2.5-4 cm. broad, entire or nearly so, almost glabrous beneath, the hairs above sparse and weak, 3-5 nerved ; *achenes* about 4 mm. long and 1 mm. broad, longitudinally ridged, pubescent ; *style* (on the fruit) up to 6 cm. long, clothed with long, soft, weak hairs.

The Trinidad and Tobago material differs from typical *C. dioica* from Jamaica by the number of leaflets and the somewhat narrow achenes with more spreading pubescence.

Crueger 1848, Laventille, Trinidad in Herb. Kew. Broadway 3028 between Parlatuvier and St. Rose, Tobago, in Herb. Brit. Mus. The only records.

Dominica, Martinique, Venezuela, Colombia and Brazil.

## FAMILY 2. DILLENACEAE.

Low *trees* or *climbing shrubs*, the stems woody. *Lvs.* alternate, often rough, entire or toothed, with parallel lateral veins. *Fls.* white or yellow, in terminal or lateral panicles, or lateral clusters. *Sep.* 5, imbricate, persistent. *Pet.* usually 5, imbricate, deciduous. *Stam.* numerous, the apex of the *filaments* more or less dilated. *Fruit* of 1-5 carpels, globose or triangular-acuminate, free from each other or more or less united, dehiscent or indehiscent. *Seeds* 1 or 2, arillate.

Amongst the introduced plants belonging to this order the best known is *Dillenia indica* L. an ornamental tree.

Sep. the 2 inner large, enclosing the fruit....1. **Davilla.**

Sep. not enclosing the fruit.

Carp. 1 .....2. **Doliocarpus.**

Carp. 2, united, globose.

Stems round; lvs. rough; anths. introrse...3. **Curatella.**

Stems conspicuously angled; lvs. smooth;

anths. extrorse.....4. **Pinzona.**

Carp. 3-5, free, triangular-cuspidate.....5. **Tetracera.**

### 1. **DAVILLA** Vand.

*Climbing shrubs. Lvs. rough. Fls. yellow, numerous, in terminal or axillary panicles. Sep. 5, unequal, the two inner much larger than the outer and enclosing the fruit. Pet. 5. Carp. 1-seeded (by abortion of a second ovule, Gr.) Seed completely enclosed in a membranous aril.*

#### 1. **D. aspera** (Aubl.) R. Benoist.

*D. lucida* Eichl., not Presl., excluding synonyms.

Mart. Fl. Bras. 13.1.104.

*Stems glabrous or nearly so; lvs. mostly elliptical, sometimes oblong, 5-16 cm. long, 3.5-6.5 cm. broad, entire or somewhat undulate, the apex rounded or acute, slightly rough on both sides, glabrous and pitted above, the mid-rib pubescent, mid-rib and veins beneath appressed pilose or pubescent, the veins very prominent; panicle up to 12 cm. broad, many fld., the branches minutely hairy; sep. silky, the hairs appressed, the two inner concave, forming a globose, leathery covering to the fruit, the margin of the larger overlapping that of the smaller, about 5 mm. long on the fruit; pet. bright yellow, oblong, broader at the apex, 4 mm long; fil. and style contorted; stig. capitate; carp. membranous; seed 2.5 mm. long.*

This species has previously been confused with *D. rugosa* Poir. which has stems and the veins of the leaves beneath long spreading pilose, the lvs. smaller and more or less serrate, and fewer and larger flowers.

Eggers 1440 in Herb. Kew and Herb. Trin. 10206 differ from typical *D. aspera* by the longer, coarser and less appressed deep yellow hairs.

Thickets and forest borders in wet and moist districts, Trinidad. Guianas, Brazil.

2. **DOLIOCARPUS** *Rol.*

*Shrubs* or *climbers*, glabrous or hairy. *Lvs.* smooth. *Fls.* white or yellow, produced in many-fl'd. clusters on the sides of the branches. *Sep.* 4-5. *Ovules* 2. *Fruit* a glabrous, dehiscent berry; *carp.* 1, globose, 1-2 seeded. *Aril* membranous, surrounding the seed.

*Lvs.* quite glabrous beneath, margin entire... 1. *D. scandens*.

*Lvs.* more or less hairy beneath, at least on the veins.

*Lvs.* appressed pubescent on the whole lower surface, veins 10-16 on each side 2. *D. dentatus*.

*Lvs.* appressed pubescent only on the veins, veins 7-8 on both sides..... 3. *D. brevipedicellatus*.

1. **D. scandens** (*Aubl.*) *Gilg.*

*Calinea scandens* *Aubl.* : *D. Calinea* *Gmel.*

*Aubl. Pl. Guiana* t. 221 : *Gr. Fl.* 3, excl. synonyms : *Mart. Fl. Bras.* 13.1.80.

*Climbing shrub*; *lvs.* leathery, oblong-lanceolate or elliptical, 8-12 cm. long, 2-4.5 cm. wide, tapering at both ends, sometimes obtuse, glabrous, entire, veins 8-10 on either side, the reticulation prominent above; *pedi.* about 2 mm. long; *sep.* minutely hairy outside, glabrous within; *anths.* suborbicular.

Los Cuevas, Caroni and Aripo Savannah, Trinidad.  
Venezuela, Guiana and Brazil.

2. **D. dentatus** (*Aubl.*) *Standl.*

*Tigarea dentata* *Aubl.* : *D. pubens* *Mart.* : *D. semidentatus* *Garcke.*

*Aubl. Pl. Guiana*, 920, t. 351 : *Gr. Fl.* 3 : *Mart. Fl. Bras.* 13.1.79. (in part) as *D. Rolandri* *Gmel.*

*Climber*, stems glabrous or hairy above; *lvs.* leathery, elliptical or elliptical-oblong, usually narrowing at the base and pointed at the apex, 10-18 cm. long, 4-8 cm. wide, entire except above the middle where it is serrate and mucronate, the mid-rib slightly channelled above, the lateral veins 10-16 on each side, glabrous or with long appressed cottony hairs above, pubescent beneath, more so on the mid-rib and veins; *pedi.* slender, 1-2 cm. long on the fruit; *sep.* membranous, pubescent outside, glabrous within, 4-5 mm. long on the fruit; *ovary* glabrous; *berry* rosy when ripe, 5-7 mm. diam. when fresh, glabrous, one seeded by abortion; *seeds* immersed in pulp, the *aril* white and slightly toothed, almost enveloping the flattish, shiny brown seed.

The name *D. Rolandri* Gmel. was incorrectly applied by Eichler and others to a mixture of *D. major* Gmel. and *D. dentatus* (Aubl.) Standl. It is really synonymous with *D. strictus* Poir. a species which has remained unidentified down to the present day.

General in dry places, Trinidad and Tobago.  
Cuba, Columbia, Guiana and Brazil.

### 3. *D. brevipedicellatus* Garcke.

Gr. Fl. 3 in part under *D. Calinea* Gmel: Mart. Fl. Bras. 13.1.81:

*Climbing shrub*; *lvs.* elliptical or ovate-elliptical, 5-10 cm. long, 3-5 cm. wide, more or less serrate, glabrous above, appressed pilose on the veins beneath, often tufted in the axils; *fls.* densely clustered; *pedi.* 2 mm. long or less, puberulous.

The leaves of Trinidad, Porto Rico and British Guiana specimens are more entire than those from Para.

St. Ann's, Trinidad.  
Porto Rico, Guiana and N. Brazil.

## 3. CURATELLA L.

Small *tree*, rough. *Lvs.* rough, stiff and leathery, more or less covered with minute stellate hairs. *Fls.* white, numerous, borne in lateral panicles on the leafless parts of the older branches. *Sep.* 4-5, the two outer enclosing the remainder. *Pet.* 4-5. *Stam.* persistent on the fruit; *fil.* slightly dilated at the apex. *Styles* sublateral on the inner side. *Carp.* 2, hispid, cohering at the base on the inner side, each 2-seeded.

### 1. *C. americana* L. Chaparro. Rough Leaf.

Mart. Fl. Bras. 13.1.68, t. 15.

A small *tree* of about 4 m. with twisted spreading branches, the bark very scaly, the young stems roughly pubescent; *lvs.* elliptical, 10-15 cm. long, 5-12 cm. wide, very rough, more so above, the veins paler in colour than the leaves and prominent beneath, the margin toothed or wavy, the apex usually notched, the base decurrent along the short petiole; *panicle* pubescent, about 3-5 cm. long; *fls.* fragrant, bracteate, 1-1.5 cm. long; *sep.* 5 mm. long, rounded; *pet.* about 6 mm. long, usually obovate; *carp.* globose, 4-5 mm. diam. in fruit, dehiscing longitudinally; *seeds* oblong, shiny, brown, about 3 mm. long, the *aril* small and membranous.

The leaves are so rough that they are reported as being used for polishing metal.

Dry hillsides and natural savannahs, Trinidad.  
Cuba, Hispaniola, Cent. and S. America.

## 4. PINZONA Mart. and Zucc.

*Climbing shrubs*, stems angular. *Lvs.* glabrous. *Fls.* in axillary panicles. *Sep.* 4. *Pet.* 3-4. *Fil.* filiform, glabrous. *Anth.* orbicular, extrorse. *Styles* terminal. *Carp.* 2, united in the lower half, 1-seeded, sometimes 2-seeded. *Berry* glabrous.

1. *P. calineoides* Eichl.

*Doliocarpus calineoides* Eichl.

Mart. Fl. Bras. 13.1.71. t. 16. f. 2 : Urb. Symb. Ant. 4. 408 :  
Sc. Surv. Porto Rico. 5.577.

*Lvs.* elliptical or somewhat obovate, the apex obtuse or acute, the base rounded or somewhat tapering into the petiole, 14-16 cm. long, 7-7.5 cm. wide, entire or wavy toothed, petioles 1-2.5 cm. long ; *panicles* 3-6 cm. long, minutely pubescent ; *fls.* small ; *pedi.* about 3-5 mm. long ; *sep.* about 2 mm. long, ciliate ; *ovaries* glabrous.

Herb. Trin. 1466, Eggers, Arima and 2643, Cruieger, Guanapo, Trinidad. Porto Rico and Guadeloupe.

## 5. TETRAGERA L.

*Woody climber.* *Lvs.* rough on both sides. *Fls.* numerous in terminal spreading panicles or axillary at the tops of the branches. *Sep.* 5. *Fil.* the apex dilated. *Fruit* of 3-5 follicles, ellipsoid, 3-angled with a sharp cusp, leathery, shiny, brown, bivalved with longitudinal dehiscence, 1-seeded. *Seeds* enclosed in a fringed aril.

1. *T. trinitensis* Sprague and Williams. sp. nov. Chaparillo.

*Stems* somewhat angular, the younger branches densely and minutely stellate pubescent ; *lvs.* elliptical to obovate, 6-16 cm. long, 3-8 cm. broad, shortly cuspidate or apiculate at the apex, rounded or obtuse at the base, somewhat decurrent into the petiole, entire or sometimes minutely toothed towards the apex, puberulous above, soon glabrescent, minutely and densely dotted, the mid rib depressed and puberulous, densely stellate pubescent beneath, the main and lateral veins bearing scattered, long, simple, appressed hairs and deciduous stellate ones, veins 8-10 on each side not joining at the apex, petiole 2.5 cm. long, appressed pilose, somewhat corky ; *fruiting panicle* 10-26 cm. long, thickly and minutely stellate pubescent ; *pedi.* 2.4 mm. long ; *sep.* persistent on the fruit, elliptical, 8-10 mm. long, 6-9 mm. broad, with several parallel raised veins outside, stellate pubescent on both sides, ciliate ; *follicles* 11-12 mm. long, the beak about 2 mm. long ; *seeds* black, about 5 mm. long, oblong-ellipsoid, the *aril* somewhat fleshy, cup-shaped, deeply cut, almost enclosing the seed.

This species has previously been confused with *T. ovalifolia* DC.

Herb. Trin. 751, 2123, 8463 and Dannouse, Aug. 25, 1899.  
St. Ann's and S. and Cent. Forests, Trinidad.

## FAMILY 3. ANNONACEAE.

*Trees* or *shrubs* often aromatic. *Lvs.* alternate, simple, entire, without stipules. *Fls.* hermaphrodite or rarely unisexual, terminal, opposite the leaves or axillary, solitary or clustered. *Sep.* 3, distinct or united, valvate. *Pet.* 6, in two series, usually thick and fleshy, valvate or slightly imbricate, the inner series sometimes small or absent. *Stam.* numerous, closely packed on a thick receptacle. *Fruit* fleshy or somewhat woody, composed of few to numerous, dehiscent or indehiscent carpels, the latter either free or united into a single, large, dry or fleshy fruit. *Seeds* solitary or 2-6, with or without *arils*.

The order is chiefly noted in Trinidad and Tobago for its edible fruits. Those of *Annona muricata* L. the soursop and *A. squamosa* L. the sugar apple are commonly cultivated. The former is principally used for making ice creams and sub-acid drinks, whilst the latter, which thrives best on the dry Bocas Islands, is esteemed as a dessert fruit.

Flowers perfect.

Carpels united in the fruit.

Pet. distinct.....1. *Annona*.

Pet. united at the base.....2. *Rollinia*.

Carpels free in the fruit.

Carpels indehiscent.....3. *Duguetia*.

Carpels dehiscent.

Sep. united, minutely 3-toothed....4. *Xylopia*.

Sep. united at the base.....5. *Anaxagorea*.

Sep. free.....6. *Cymbopetalum*.

Flowers unisexual, trees dioecious.....7. *Alemene*.



1. *ANNONA* L.

*Trees or shrubs.* Fls. solitary or few together, peduncled, terminal or opposite to the leaves. *Sep.* small, valvate. *Pet.* the outer series fleshy, valvate, the inner series either somewhat similar or small or wanting. *Receptacle* hemispherical. *Fruit* large, fleshy, formed of the numerous, united carpels. *Seeds* solitary, erect.

*Pet.* the inner series large.

Fruit with long, curved, fleshy spines...1. *A. muricata.*

Fruit with minute, straight, fleshy spines...2. *A. montana.*

Fruit with rigid, pyramidal protuberances...3. *A. involucreta.*

Fruit smooth.....4. *A. glabra.*

*Pet.* the inner series absent or reduced to minute scales.

Fruit smooth.....5. *A. reticulata.*

Fruit tuberculate.

Fls. usually few clustered.....6. *A. squamosa.*

Fls. solitary.....7. *A. trinitensis.*

1. *A. muricata* L. Soursop.

Macf. Fl. Jam. 7: Fawc. and Rendl. Fl. Jam. 3. 195.

Small tree, 5-8 m. high; *lvs.* obovate-oblong, shortly acuminate, 10-15 cm. long, 3.5-4.5 cm. broad, glabrous; *pet.* greenish-yellow, fleshy, the outer sub-cordate, acute, 3-3.5 cm. long, 2.3 cm. broad, the three inner slightly smaller; *fruit* ovoid, oblong-ovoid or cordate-oblong, 15-20 cm. long or more, 8-10 cm. broad, green, with long, fleshy curved spines, pulp white; *seeds* black or brown, 1.5 cm. long, 1 cm. broad.

Occasionally spontaneous after cultivation.

W. Indies, cultivated in Continental Trop. America and West Africa.

2. *A. montana* Macf. Mountain or Wild Soursop.

Macf. Fl. Jam. 7: Safford. Cont. U.S.A. Nat. Herb. 18.1.

*Tree* 5 m.; *lvs.* oblong, shortly acute, glabrous, the axils of the lateral veins usually pitted and fringed beneath, shiny above, 10-20 cm. long, 5-8.5 cm. broad; *sep.* acute, fringed, about 8 mm. wide; *pet.* pale greenish-yellow, the outer series pubescent, rounded-ovate, acute, thick, leathery, 3-3.5 cm. long, 2-2.5 cm. wide, the inner series pale salmon, somewhat smaller, thinner,

concave and rounded; *fruit* dry, ovate or subglobose, not edible, about 5-15 cm. diam., with small fleshy spines 10-15 mm. apart; *seeds* pale brown, about 18 mm. long and 10 mm. broad.

Diego Martin and Belmont, both populated districts, Trinidad. There is no authentic information that the species is native.  
West Indies and Guiana.

3. **A. involucrata** Baill.

A. Prestoei Hemsl.; Safford Cont. U.S.A. Nat. Herb. 32. t. 1516.

*Tree* up to 18 m.; *lvs.* elliptical to obovate-oblong, 28-30 cm. long, 15-17.5 cm. broad, usually shortly and abruptly pointed, rusty-hairy above at first, at length glabrous, persistently rusty-hairy beneath; *cal.* and outer *pet.* densely and shortly rusty-hairy; *cal.* lobes broadly ovate, 2.5-3 cm. long; *pet.* the 3 outer very thick, ovate-lanceolate, 3.5-6.2 cm. long, 3-3.5 cm. broad, the 3 inner thinner than the outer, suborbicular or broadly rounded; *fruit* spheroidal, 10-12.5 cm. diam., covered with rigid, pyramidal protuberances, more or less 4-cornered, the apex not hooked; *seeds* brown; *pulp* yellow or orange-coloured, fragrant.

Forest, Siparia Quarry, Trinidad.

4. **A. glabra** L. Alligator Apple. Pond Apple. Corkwood.

A. palustris L.

Safford, Cont. U.S.A. Nat. Herb. 18.14; Macf. Fl. Jam. 8.

*Tree*, 5-8 m.; *lvs.* oblong-elliptical, acute, glabrous, 7-15 cm. long, 4-6 cm. wide; *pet.* the 3 outer ones roundish-ovate, subacuminate, concave, thick, leathery, the 3 inner half the size of the outer, acute, externally whitish, internally of a dark blood colour; *fruit* yellow, ovoid, smooth, about 7 cm. long, longer than broad, not edible; *seeds* brown, about 15 mm. long, 10 mm. broad.

The wood is buoyant and said to be used in Jamaica as a substitute for cork.

Maracas Bay, Trinidad.

Many of the W. Indian Islands, S. America and W. Africa.

5. **A. reticulata** L. Cashinar. Coeur de Boeuf. Bullock's Heart, Custard Apple.

Bot. Mag. tt. 2911 and 2912; Macf. Fl. Jam. 11.

Small *tree*, 2-6 m.; *lvs.* oblong or oblong-lanceolate, 10-15 cm. long, 2-5 cm. broad; *pet.* of the outer series, oblong, keeled on the inner side, 2-3 cm. long, purple at the base, the inner series

reduced to minute scales or wanting; *fruit* large, rounded, variable in shape and size, 10 cm. or more in diam., brownish-red, pulp granular, yellowish, edible, very sweet; seeds dark brown, shiny, 12-15 mm. long, 7 mm. broad. The fruit is said to be a remedy for dysentery.

Cultivated. Doubtfully native to Trinidad or Tobago.  
West Indies generally.

6. *A. squamosa* L. Sweet Sop. Sugar Apple. Pomme canelle.

Bot. Mag. 3095: Macf. Fl. Jam. 9.

Small *tree*, 5-6 m.; *lvs.* oblong or lanceolate-oblong, more or less pubescent, 7-15 cm. long, 2.5-6 cm. wide; *fls.* usually few clustered; *pet.* the three outer thick, narrowly oblong, about 2 cm. long and 4 mm. broad, the 3 inner reduced to minute scales; *fruit* globose or ovoid, tuberculate, the tubercles large and rounded, glaucous, 8-9 cm. broad, pulp whitish tinged with yellow, edible, very sweet, popular for dessert purposes.

Cultivated and naturalized in dry places near the sea, doubtfully native, Trinidad and Tobago.  
West Indies.

7. *A. trinitensis* Safford. Silky Annona.

Safford, Cont. U.S.A. Nat. Herb. 16. 268.

*Tree*, 5-6 m., the young branches clothed with rusty hairs; *lvs.* ovate, oblong, elliptical or obovate, obtuse or shortly and rather obtusely acuminate at the apex, wedge shaped or rounded at the base, 9.5-15 cm. long, 5.5-6.5 cm. broad, hairy, more so beneath, petioles 4-10 mm. long, hairy; *cal.* lobes broadly ovate, shortly acute, silky; *pet.* 3, yellowish, ovate, obtuse, 18-20 mm. long, 15 mm. broad, silky on the outside; *fruit* 2.5-3.5 cm. long and about 2 cm. diam., warty; *seeds* 4.5-5 mm. long, 2.5 mm. broad. Closely allied to *A. sericea* Dunal.

Type coll. by Fendler in Trinidad, 1877-80. Herb. Trin. 11273 and 11321, R. O. W. and W. G. F. Sangre Grande, Trinidad.

DOUBTFUL SPECIES.

Herb. Trin. 8704 & 10170 Dade's Rd., Rio Claro, El Corosal, Tabaquite and 11470 Plum Road, Williams. Unmatched but material insufficient for description.

2. **ROLLINIA** *St. Hil.*

Small trees. *Lvs.* membranous or leathery. *Fls.* solitary or in pairs, terminal or opposite to the leaves. *Pet.* the 3 outer fleshy, united at the base, almost covering the central organs, the lobes spreading, the three inner reduced to minute scales or wanting. *Receptacle* convex. *Fruit* globose or ovoid, the *carpels* numerous, united and 1-seeded.

Sep. pouched, 2 mm. broad.....1. *R. multiflora*.

Sep. not pouched, 4 mm. broad.....2. *R. mucosa*.

1. ***R. multiflora*** *Spliz.* Wild Cashimar. Wild Sugar Apple.

Gr. Fl. 6.

Small tree, 5-10 m; *lvs.* oblong, the apex acute or obtuse, rounded or wedge-shaped at the base, somewhat leathery, 8-16 cm. long, 3-6 cm. broad, brownish and minutely hairy beneath, shining and glabrous or with minute scattered hairs above; *fls.* densely cottony and rusty brown in colour; *pedi.* about 2 mm. long; *sep.* pouched and with a terminal point, 2 mm. broad at the base; *pet.* oblong, rounded, 8-12 mm. long; *fruit* small, 1-2 cm. broad, globose, smooth, covered with minute, rusty brown hairs.

General throughout Trinidad.

Trop. S. America.

2. ***R. mucosa*** (*Jacq.*) *Baill.* Wild Sugar Apple.

*R. Sieberi* DC.

Cont. U.S.A. Nat. Herb. 1858: Gr. Fl. 6.

*Tree* 10-15 m.; the young branches hairy; *lvs.* membranous, oblong, ovate-oblong, elliptical or obovate-oblong, the apex usually acute, the base rounded or acute, 10-19 cm. long, 4-7 cm. broad, the veins prominent, hairy beneath, especially on the veins which are also hairy above; *fls.* hairy, the stalks 2-3 cm. long; *sep.* broadly triangular, 4 mm. broad, broader than long, with a terminal point; *pet.* greyish; the 3 outer oblong-ovate with a rounded apex, 10-20 mm. long, densely cottony; *fruit* large, (not seen).

San Fernando Hill; Diego Martin, Trinidad.

West Indies; Mexico.

## DOUBTFUL SPECIES.

Herb. Trin. 6397, without date or locality, differs from the two foregoing species. The *fls.* are larger, the petals being

about 2.5 cm. long; from the imperfect calyx lobes on the specimen they would seem to be somewhat like those of *R. mucosa* (Jacq.) Baill. The leaves also resemble in shape that species but differ in the reddish under-surface.

### 3. DUGUETIA St. Hil.

*Trees*, the young branches scaly. *Lvs.* with stellate scurf beneath. *Fls.* clustered, opposite the leaves. *Pet.* imbricate in the bud, unequal, somewhat leathery. *Fruit* composed of numerous, unequal, very closely packed carpels, somewhat woody when ripe, indehiscent. *Seeds* without arils.

#### 1. *D. lucida* Urb.

Urb. Symb. Ant. 1.308.

*Tree* 6-10 m.; *lvs.* lanceolate to elliptical-oblong, the apex obtuse or acuminate, 8-15 cm. long, 3.5-5 cm. broad, dotted, leathery, shiny above; *fls.* 1 to about 8; *sep.* greenish, ovate, acute, about 1 cm. long, woolly; *pet.* outer series oblong-lanceolate, bluntish, reflexed, yellowish green, about 14 mm. long, the inner series slightly shorter, yellowish green except at the base inside where they are red, concave, glabrous, warty and somewhat fleshy; *fruit* spherical, about 5 cm. diam.; *receptacle* woody, angled, and swollen at the base; *carp.* at length woody, angled and sharply pointed, unequal in size, up to 2 cm. long, many are without seed; *seeds* solitary, brown, obovoid, 14 mm. long.

Urban apparently had not access to a mature fruit when he described the above as the Herbm. No's. referred to by him have only immature fruits.

Chaguanas; Maracas; Caparo; St. Joseph Hill, Trinidad.

### 4. XYLOPIA L.

*Trees.* *Lvs.* leathery. *Fls.* axillary, solitary or clustered, shortly stalked. *Cal.* cup-shaped, formed of 3 united sepals. *Pet.* valvate, the outer series linear, thick, the inner included, 3-angled above. *Styles* joined together, long exerted. *Fruiting carpels* numerous, distinct, at length dehiscent, oblong. *Seeds* 2-6, with a small scale-like aril.

1. *X. cubensis* A. Rich.

*X. grandiflora* Griseb. Fl. 6, partly, not Aug. St. Hil.  
A. Rich. Fl. Cuba 2.12. t. 6.

*Tree* about 14 m.; *lvs.* oblong-lanceolate, glabrous, shining above, glabrous or with minute appressed hairs beneath, 10-14 cm. long, 2.5-4 cm. broad, petioles short, grooved above; *fls.* few in the clusters; *cal.* 4 mm. long, minutely 3-toothed, the base of the tube almost surrounded by a bract; *outer petals* about 13 mm. long; *carp.* when ripe 1-2 cm. long, 4-7 mm. broad, incurved, irregularly cylindrical, arranged on a rounded and somewhat flattened *receptacle* 5-8 mm. broad, the stalks 3-5 mm. long; *seeds* black, shining, about 5 mm. long, sub-cylindrical.

Trinidad material is somewhat more glabrous than that from Cuba and the Isle of Pines and the bract is inserted immediately below the calyx.

Arima Woods and Maracas, Trinidad.  
Cuba and Isle of Pines.

5. *ANAXAGOREA* St. Hil.

*Trees.* *Fls.* axillary, shortly pedicellate, solitary or clustered, small. *Sep.* united at the base. *Pet.* valvate. *Fruit carp.* few to about twelve, tapering at the base into a club-shaped stalk, dehiscent within. *Seeds* erect, flat on one side and rounded on the other, without arils.

1. *A. acuminata* St. Hil.

Gr. Fl. 7.

A small or medium-sized *tree*, the young branches and petioles scurfy; *lvs.* elliptical-oblong, the apex obtuse or acuminate, 10-22 cm. long, 4-8 cm. broad, glabrous and somewhat leathery; *sep.* broadly triangular, united to about the middle; *carp.* when ripe scurfy, about 2.5 cm. long, including the stalk, and 1 cm. broad, with a small point at the apex; *seeds* 4, shiny, rich brown, 10-14 mm. long.

The North Coast and Maraval Valley, Trinidad.  
Guiana.

6. **CYMBOPETALUM** Benth.

Small tree or shrub. *Lvs.* membranous. *Fls.* large, solitary, terminal or lateral on long stalks. *Sep.* ovate. *Pet.* valvate, the inner series larger and much more fleshy than the outer, with the margins rolled inwards and with an inflexed point. *Receptacle* hemispherical or subglobose. *Fruit* oblong, somewhat compressed. *Carp.* numerous, dehiscent. *Seeds* ovoid, with a raised margin, the *aril* very thin, bi-lobed.

1. **C. brasiliense** (Vell.) Benth.

*Uvaria brasiliense* Vell.

Journ. Linn. Soc. 5. 69.

*Lvs.* oblong or obovate-oblong, abruptly pointed, 13-30 cm. long, 5-10 cm. broad, glabrous or nearly so; *pedu.* about 9 cm. long; *sep.* 5 mm. long; *pet.* densely cottony, the three outer ovate, 2.5 cm. long, the three inner 3.2 cm. long; *fruit* crimson and yellow, the *carpels* 3-4 cm. long and about 1.5 cm. broad, the stalks 1.5 cm. long; *seeds* light brown, about 1.2 cm. long; the scarlet *aril* about two-thirds the length of the brownish-black seed, entire.

Fendler 204, Herb. Brit. Mus. and Herb. Trin. 6797.  
Northern Hills and Southern districts, Trinidad.  
Brazil and Peru.

7. **ALCMENE** Urb.

Small tree. *Lvs.* 2-ranked, shortly petioled. *Fls.* unisexual (only the male known), solitary, terminal on dwarf branches, which arise below the insertion of the petioles of the foliage leaves, and are themselves densely crowded with very small leaves. *Sep.* 3, leathery, entirely enclosing the petals in the bud. *Pet.* 6, thick and rigid, outer series ovate, strictly valvate, inner series oblong, slightly narrowed below the middle, with their tips overlapping. *Receptacle* semi-globose, hollowed at the top. *Carp.* in the male flower 6-8, linear with a slightly broader base. *Ovules* wanting. *Styles* linear.

1. **A. tobagensis** Urb.

Fedde, Rep. 17 (1921) 167.

Young branches angled, pubescent with yellow, many-rayed stellate hairs, internodes 0.8-2 cm. long; *lvs.* oval, or rarely obovate, with a produced point, 6-15 cm. long, 3-5.5 cm. wide; very shortly pubescent on the middle vein otherwise glabrous and

shining above, with stellate hairs beneath set thickly on the middle vein and scattered on the laterals, papery or somewhat leathery, petioles 2-4 mm.; *pedi.* 3-4 mm. long; *buds* (so far as seen by Urban) 11 mm. long, 8 mm. diam., covered densely with very short stellate hairs; *sep.* narrowly ovate, ridged on the back, grooved within; exterior *petals* with adpressed stellate hairs without, shortly pubescent at the top within; *styles* as long as the carpels, erect, shortly hairy. *Not seen.*

Broadway 4191, near Easterfield, Tobago, the only record.

#### FAMILY 4. MENISPERMACEAE.

*Trees or climbing shrubs.* *Lvs.* alternate, entire, palmately veined, without stipules. *Fls.* small, in axillary panicles, unisexual, the male and female being borne on different plants. *Sep.* and *Pet.* minute. *Stam.* united into a column. *Carp.* solitary. *Fruit* a succulent, 1-seeded drupe.

##### 1. CISSAMPELOS L.

*Climbing shrubs.* *Fls.* yellowish-green, minute, the *male* in spreading, cymose panicles, bracteate. *Sep.* 4. *Pet.* united, entire, about half the length of the sepals, the apex of the staminal column peltate with four sessile anthers on the margin. *Female fls.* clustered in the axils of roundish, leafy bracts on more or less elongated panicles. *Sep.* 1. obovate. *Pet.* 1, broader and shorter than the sepal, and opposite to it. *Style* 3-lobed. *Drupe* subglobose, hairy.

1. *C. Pareira* L. Velvet leaf.

Gr. Fl. 10: Fawc. & Rendl. Fl. Jam. 3. 193.

*Branches* slender; *lvs.* roundish to heart-shaped, often peltate, 3-12 cm. broad, variously hairy, from sparsely so to densely felty beneath; the *male infl.* 2-10 cm. long, the *female* usually longer and less spreading than the male, both hairy; *drupe* scarlet, 4-5 mm. broad; *seed* horse-shoe shaped, corrugated.

The *roots* are reported by Grisebach to be employed against various diseases and especially as an antidote to the bite of serpents.

General; Trinidad and Tobago.  
Tropics generally.

## FAMILY 5. CABOMBACEÆ.

Perennial aquatic *herbs*, with slimy stems. *Lvs.* floating or immersed. *Fls.* solitary, axillary. *Sep.* 3, rarely 4. *Stam.* 3-18. *Carp.* 2-18, distinct. *Ovules* 2 or 3. *Fruits* indehiscent, leathery, separate. *Seeds* 1-3.

1. CABOMBA *Aubl.*

Aquatic *herb*, rooting in mud, the stems slender. *Lvs.* of two forms, the submerged ones finely divided, the floating ones peltate. *Fls.* small, on long stalks, solitary in the leaf axils. *Sep.* 3, petaloid. *Pet.* 3. *Stam.* 6. *Carp.* 1-3 (usually 3), distinct, superior. *Ovules* 2-3, pendulous.

1. *C. Piahyensis* *Gardn.*

Hook. *Icones Pl. t.* 641.

*Stems* long, often rooting at the joints; *lvs.* the submerged ones usually in whorls of three, circular in outline, 4-5 cm. diam., primarily cut into 5-7 divisions which are again divided into green, thread-like segments, petiole about 1.5 cm. long, floating leaves simple, linear, about 1.5 cm. long; *fls.* mauve with a yellow centre, on stalks rising 1-2 cm. above the water, opening at noon, closing at dusk, about 1 cm. diam.; *sep.* oblong, rounded at the apex, about 8 mm. long; *pet.* oblong, clawed, eared on either side, the ears yellow; *carp.* spindle-shaped, about 5 mm. long, when ripe each containing 2-3 minute, rounded, brown seeds, marked with crimson and black dots.

Shady stream, Caroni Old Road, Trinidad.  
Cuba, Porto Rico, Brazil.

## FAMILY 6. NYMPHÆACEÆ.

*Aquatic herbs* with submersed rhizomes, rooting in mud. *Lvs.* floating, entire or toothed. *Fls.* solitary, large and showy, on long stalks, usually opening above water. *Sep.* usually 4. *Pet.* and *Stam.* numerous, the *filaments* often petaloid, inserted on the receptacle. *Carp.* numerous, free or united. *Ovules* numerous, pendulous. *Fruit* submerged when mature.

Of the cultivated plants of this order the water lilies (*Castalia*) are best known; there are several introduced species with rosy, red, white or blue flowers, opening by night or day.

*Nelumbium speciosum* Willd., the sacred Lotus, an aquatic with peltate leaves and large, pink flowers, both borne high above the water, occurs in some plant collections.

*Victoria regia* Lindl. with its immense floating leaves with up-turned edges and spiny under surfaces, is occasionally grown in the St. Clair Experiment Station.

### 1. CASTALIA Salisb.

*Rhizomes* thick, perennial. *Lvs.* floating, the petioles very long, the blade cleft nearly to the centre. *Fls.* floating or borne above the water, large and showy. *Sep.* 4, inserted at the base of the receptacle. *Pet.* numerous, in many series, passing gradually into stamens, both inserted on the receptacle. *Stam.* numerous, the *filaments* petaloid, the outer broad with small anthers, the inner narrow with longer anthers. *Carp.* immersed in the fleshy receptacle, and united with it into a many-celled, half inferior ovary. *Ovules* numerous. *Berry* spongy, ripening under water, breaking irregularly. *Seeds* immersed in pulp with a sack-like *aril*, open at the apex.

Fls. diurnal, connective appendaged .....1. *C. ampla*.

Fls. nocturnal, connective not appendaged.

Petioles glabrous at the top .....2. *G. Rudgeana*.

Petioles encircled at the top with a ring  
of hairs.....3. *C. amazonum*.

#### 1. *C. ampla* Salisb.

*Nymphaea ampla* DC.

Fawc. & Rendl. Fl. Jam. 3. 183: Gr. Fl. II: Conard  
Water-lilies, t. 5.

*Lvs.* 15-40 cm. broad, roundish, peltate, wavy-toothed or nearly entire, under surface red-purple; *fls.* white, 7-18 cm. broad, diurnal, raised above the water; *sep.* oblong-lanceolate, outer surface green, marked with blackish lines; *pet.* 7-21, oblong-lanceolate, the outer tinged yellowish green; *stam.* yellow; *anths.* having the connective of those of the outer series produced into an appendage; *carp.* 14-23, free from one another at the sides; *style* short, conical, narrowed to the apex, stiff and fleshy.

(Fendler 207 ex Conard) Trinidad.  
Cent. America and West Indies.

2. *C. Rudgeana* (Meyer) Britt. & Wilson.

*Nymphaea Rudgeana* G. F. W. Meyer.

Fawc. & Rendl. Fl. Jam. 3. 184: Gr. Fl. II: Conard l.c. t. 20.

*Lvs.* rounded, about 30 cm. broad, deeply and irregularly toothed, green above, reddish on the margins beneath, prominently veined beneath, the petioles brownish, glabrous; *fls.* pure white, greenish-yellow with age, strongly odorous, opening at dusk and closing at daylight; *sep.* oblong-ovate, 6 cm. long, 2.5 cm. wide, green without, white within; *pet.* in series of fours, the outer expanding, elliptical to ovate, similar in size to the sepals, the inner erect, smaller and tapering; *anths.* without an appendage; *stig.* funnel-shaped; *styles* yellow, with enlarged club-shaped tips; *fruit* 5-6 cm. diam., round, bearing the persistent sepals, petals and stamens; the *petals* change to a rosy-red colour and expand nocturnally when the fruit is mature; *carp.* about 23.

Ponds near Piarco and Caroni, Trinidad.  
Jamaica to Brazil.

3. *C. amazonum* (Mart. and Zucc.) Britt. & Wilson.

*Nymphaea amazonum* Mart. & Zucc.

*N. Rudgeana* var. *amazonum*. Gr. Fl. 12.

Fawc. & Rendl. Fl. Jam. 3. 184: Urb. Symb. Ant. 4. 235:  
Conard l.c. t. 19.

*Lvs.* rounded, the margin red, entire, the under surface brownish-red, 18 cm. diam. or less, a little longer than broad, the petiole having a thick ring of long hairs at the top; *fls.* nocturnal, creamy white, floating, strongly odorous; *sep.* 4, green, marked on the exterior with dark broken lines, rosy at the base, ovate-oblong to ovate-pointed, about 6 cm. long and 2.5 cm. broad; *pet.* in series of fours, the outer ones marked on the exterior with broken red lines, ovate-oblong, pointed; *anths.* without an appendage; *styles* red, with enlarged club-shaped tips; *fruit* rounded, about 4 cm. diam. bearing the persistent sepals and petals, the apex flattish, funnel-shaped; *carps.* 34 in the fruit examined.

Caroni, Trinidad. Studley Park, Tobago. Broadway 4560 in Kew Herbarium.

West Indies to Brazil.