STUDIES IN THE GENUS COCCOLOBA, III. THE JAMAICAN SPECIES

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IN A REVISION of any West Indian genus of plants having wide-ranging species, the taxonomist invariably must center part of his study on the vegetation of the island of Jamaica. The specimens and the writings of the early botanists and naturalists in Jamaica, men like Hans Sloane and Patrick Browne and Olaf Swartz were accepted by Linnaeus and became the types and starting points for study of important taxa in the Caribbean vegetation. In the difficult genus *Coccoloba*, it has been necessary to spend a disproportionate amount of time on the few wide-ranging species and the great variety of names and applications given them. The lack of consistency in the successive publications of Lindau as the most recent monographer of the genus, Grisebach, Eggers, Britton and others has increased the task of assigning the proper name to each taxon. The failure of these writers to understand the normal and abnormal variations of these plants as seen in herbarium sheets has added to the difficulties of modern identification and definition.

Fawcett & Rendle, in preparing a treatment of the genus for the Flora of Jamaica, examined the Linnaean species of *Coccoloba* and published a note on these in the Journal of Botany in 1913. This was followed in 1914 with a treatment of the genus as it occurs in Jamaica and in this work eighteen species were recognized and defined in addition to one species which was recorded as "insufficiently known." Since that time only one species has been described as new to the flora of Jamaica and no species have been added to the flora by published extensions of ranges, although many erroneous herbarium identifications might have been so considered.

Fawcett & Rendle's treatment of the genus in the Flora of Jamaica is unfortunately based on an inadequate knowledge of the genus as indicated at the beginning in the generic description. The functionally unisexual flowers; the occurrence of pistillate flowers singly and the staminate flowers in multiples at the nodes of the inflorescence; the variation between adventitious and normal growth in pubescence, leaf size and leaf shape; the ability of the plants to flower in juvenile or adventitious leaf condition; the phenomenal morphological variation following injury and the frequent occurrence of hybrids, particularly those involving *Coccoloba uvifera*, are characteristics which only careful field experience could evaluate and which have not been taken into account in the generic treatment in the Flora of Jamaica.

In preparation for this paper, I have had the unusual opportunity of field work expressly for the study of *Coccoloba* populations, as well as trips which permitted attention to species of this genus. I am indebted to the American Philosophical Society for a grant from the Penrose Fund which

made possible an extended field trip in 1950 and a study of this genus from Trinidad to Cuba in the West Indies. More recently, with the aid of grants from the Institute of Jamaica and the support of both the Reynolds Jamaica Mines Company and the Kaiser Bauxite Company, I have made several field trips to Jamaica in order to study plants growing on bauxite soils, among them species of *Coccoloba*. I am grateful to the directors of these organizations for the support and cooperation offered during my visits. In the summer of 1955 while in Europe to attend the International Horticultural Congress, it was possible to visit many herbaria and gardens where the species of *Coccoloba* in the herbaria and under cultivation were studied. In addition, I have borrowed herbarium material from many botanical organizations and am appreciative of the use of material from the following herbaria cited in this paper: Arnold Arboretum (A), Berlin Botanical Garden (B), British Museum (BM), Copenhagen (C), Chicago Natural History Museum (F), University of Göttingen (Gott.), Gray Herbarium (GH), University College of the West Indies (J), Institute of Jamaica (IJ), Kew (K), Linnaean Society of London (L), Missouri Botanical Garden (MO), New York Botanical Garden (NY), Naturhistoriska Riksmuseum, Stockholm (S), U.S. National Herbarium (US). Only the basic synonymy and most important references are given for each species. The older references for these species are published in Lindau's monograph.

Coccoloba P. Br. ex L. Syst. Nat. ed. 10, 1007, 1367. 1759. Taxon 3: 114, 156, 233. 1954, nom. conserv.

Guaiabara Miller, Gart. Dict. ed. 4, 2: 1754.
Coccolobis P. Br. Civ. Hist. Jam. 209, *pl. 14, f. 3.* 1756.

Shrubs or trees, often with scandent branches or vines; branches terete, often geniculate, or arranged in one plane, short shoots commonly developed laterally or the terminal shoots of limited growth becoming long shoots; nodes commonly tumid; ochreae characteristically developed, membranaceous or coriaceous, deciduous or persistent, or so in part, glabrous, puberulent or pilose; leaves alternate, minute to large, membranaceous, chartaceous or coriaceous, the margin entire to undulate, flat or revolute, the primary veins straight to the margin, much branched at the apex becoming reticulate or arcuate and anastomosing or arcuate and bifurcate-anastomosing, the secondary venation obscure or coarsely to minutely reticulate, the upper leaf surface commonly pitted, rarely pubescent, the lower leaf surface glabrous to pilose, short multicellular glands present or the glands depressed in the lamina producing resinous secretions; petioles terete to stout, broadly and shallowly canaliculate above, pilose to glabrous, the base often tumid, attached at the base of the ochreae or above the base to two-thirds the length of the ochreae; plants dioecious or monoecious; inflorescence racemose or sub-spicate, spicate or paniculate, terminal on the primary or lateral branches, few-flowered and short to many-

flowered and several times the length of the leaves, the rachis glabrous, puberulent, pilose or with glandular excretions; flowers unisexual or functionally so, the staminate flowers in clusters of two to four at each node of the inflorescence, occasionally solitary, the pistillate flowers solitary; bracts subtending each node, the flowers developing in a membranaceous sheath which ruptures irregularly or regularly to become an ochreola, the ochreolae membranaceous, generally one per flower, occasionally more by abortion of flowers, rarely stalked, the flowering pedicels shorter than the ochreolae to many times as long, the flowers articulated at the apex of the pedicel; perianth campanulate at the base forming a hypanthium, the lobes 5, imbricate, the outer three slightly larger than the inner, the stamens 7 or 8 borne on the hypanthium, the filaments united at the base, the anthers introrse, the stamens in the pistillate flowers rudimentary, the pistil rudimentary in the staminate flowers, trigonous in the pistillate flowers, the styles 3, dilated at the apices, the ovary 1-celled, the ovule solitary, attached basally; perianth expanding in fruit, the lobes surrounding the achene or the hypanthium expanding surrounding the achene with the perianth lobes appressed against the apex of the achene or coronate on the achene, the achene with a hard shiny outer layer, the inner layer papery; seed with ruminated endosperm, the major lobes 3, the minor lobes and involutions numerous, the embryo centrally located, the cotyledons orbicular, flat, rarely folded, the radicle small, terete.

TYPE SPECIES: *Coccoloba uvifera* L.

KEY TO THE SPECIES FOUND IN JAMAICA

A. Inflorescence paniculate.
  B. Pedicels 0.5 mm. long, shorter than the ochreolae in flower, to 1.5 mm. long, slightly exceeding the ochreolae in fruit; leaves rounded to cordate at the base, deciduous, the tree often barren of leaves for short periods. . . . . 1. *C. plumieri.*
  BB. Pedicels 3–6 mm. long, exceeding the ochreolae in flower and in fruit; leaves broadly cuneate at the base, the tree apparently never devoid of leaves. . . . . 2. *C. proctori.*
AA. Inflorescence racemose, the racemes solitary or rarely with 1 or 2 smaller ones at the base.
  B. Leaves thick, generally broader than long; plants of sea coast. . . . . 3. *C. uvifera.*
  BB. Leaves membranaceous to thinly coriaceous, longer than broad.
    C. Pedicels shorter or only slightly exceeding the ochreolae.
      D. Ochreolae several, persistent, conspicuous; rachis stout; pedicels very short; leaves usually turning black on drying. . . . . 4. *C. swartzii.*
    DD. Ochreolae solitary, deciduous; leaves buff or tan on drying.
      E. Inflorescence shorter than the leaves; the blades ovate, acuminate at the apex, cordate at the base, usually exceeding 7 cm. in length; inflorescence rachis conspicuously angled; with pedicels ascending; fruit ovoid, averaging 9 mm. long and 8 mm. in diameter. . . . . 5. *C. troyana.*

EE. Inflorescence exceeding the leaves; blades ovate-oblong, acute at the apex, obtuse or rounded at the base, usually less than 5 cm. long; inflorescence rachis not angular, the pedicels diverging at right angles; fruit strongly 3-lobed at the base, 5 mm. long and 3 mm. diameter on the average. ..... 6. *C. krugii.*

CC. Pedicels conspicuously exceeding the ochreolae in flower and fruit.

D. Leaves borne above the base of the ochreae, the base of the ochreae at leaf attachment generally conspicuously swollen.

E. Leaves appearing to be clustered on short lateral shoots, membranaceous, ovate-elliptical; inflorescence generally curved or drooping, pedicels thin. ..... 7. *C. tenuifolia.*

EE. Leaves coriaceous, oblong elliptic, generally spaced on the branches which are often wand-like or scrambling; inflorescence stout, generally straight and erect; pedicels stout. ..... 8. *C. longifolia.*

DD. Leaves borne at the base of the ochreae without conspicuous swelling evident.

E. Leaf blades usually oblong-elliptic, rounded at the apex, generally darkening on drying but uniform in color on both sides. ..... 9. *C. diversifolia.*

EE. Leaf blades broadly elliptic to rounded-elliptic, the apex acute or acuminate; blades turning black above on drying, usually lighter below. ..... 10. *C. zebra.*

1. **Coccoloba plumieri** Griseb. Fl. Brit. W.I. 162. 1859; Lindau, Engl. Bot. Jahrb. **13**: 134. 1890, Symb. Antill. 1: 220, 1899; Fawcett & Rendle, Flora Jam. 3: 113. 1914.

Coccoloba polystachya Wedd. var. *jamaicensis* Fawcett & Rendle, Jour. Bot. **51**: 125. 1913, Flora Jam. 3: 112. 1914.

Uvifera plumieri O. Ktze. Rev. Gen. 2: 562. 1891.

Trees to 60 ft. tall, trunk diameter breast height 18 in.; bark scaly; crown dense, branches spreading; the branchlets stout, terete, lightly striate; nodes only slightly enlarged; ochreae large, 10–15 mm. long, obliquely truncate, membranaceous at the apex and deciduous, coriaceous and persistent at the base, puberulent when young, soon glabrate; petioles 3–5 cm. long, attached at the base or below the middle of the ochreae, puberulent or glabrate; leaf blades oblong-elliptic, broadly ovate or oval, membranaceous to subcoriaceous 32 × 20; 27 × 16; 20 × 13, 13 × 7 cm. glabrous; apex obtuse to bluntly acuminate; base cordate, rarely truncate; margin entire, flat or slightly undulate; midrib and primary veins evident above, prominent below, primary veins 7–9 pairs, arcuate ascending, anastomosing near the margin, ultimate venation reticulate, evident but not prominent on both surfaces; inflorescence terminal paniculate, often uniformly branched from the base, the branches 15–25 cm. long and broad, rachises angular, puberulent or glabrate; flower nodes distinct; bracts semiorbicular, minute, less than 0.5 mm. long; ochreolae membranaceous, minute, less than 0.5 mm. long; flowering pedicels minute, less

than 0.5 mm. long; fruiting pedicels to 1.5 mm. long; pistillate flowers always solitary; staminate flowers 1 to few at each node, perianth tube 1.5–2 mm. long, perianth lobes broadly ovate to suborbicular 2–3.5 mm. long and wide, functional stamens with filaments 3 mm. long at anthesis, the anthers 1 mm. long; pistillate flowers with rudimentary stamens 0.5–1 mm. long; functional pistil 2–3 mm. long, the pistil of staminate flower rudimentary 1 mm. long; fruit ovoid, rounded or subtruncate at the base, slightly narrowed at the apex to the subcoronate perianth lobes, 15–17 mm. long, 10–13 mm. thick, the lobes 2–3 mm. long; fruit perianth heavily and coarsely fibrous; achene pale brown, obtusely 3-angled, strongly apiculate at the apex.

Clarendon: Spaldings *Dignum 68* (IJ). **Manchester:** Mandeville, *Britton 3233* (NY); Moorlands Estate, 2 miles NE of Spur Tree, *Howard & Proctor 14439* (A), *Proctor 10593* (IJ). **St. Ann:** Soho, *Harris 12023* (F, MO, NY, US); Lydford Post Office, *Howard & Proctor 13398* (A, IJ), *14247* (A), *Proctor 8637* (IJ), *8687* (A). **St. Elizabeth:** Pepper, *G. S. Miller 1366* (US). **Westmoreland:** *Purdie s.n.* (K, TYPE of *C. polystachya* var. *jamaicensis;* NY, drawing). Without locality: *Alexander*, collected in 1850 (Gott. TYPE; NY, B, G), *March 1941* (B, Gott.).

COMMON NAME: Wild Grape. Collected in flower: January, July. Collected in fruit: December, January and April.

Coccoloba plumieri is the only species of the genus in Jamaica which is completely deciduous. Harris in his field notes reports plants from St. Ann to be in leafless condition in April and May. Proctor and I found plants with very young leaves just developing on plants in St. Ann in late December. As in many tropical trees, the young leaves of *C. plumieri* are limp and hanging when young and increasing in size. They become firm and coriaceous only when fully developed in size. The young leaves seen were often attractively colored red or bronze.

In the original description of *C. plumieri* Grisebach described the inflorescence of these plants as "racemes compounded at the base." His description was based on collections by Prior and March in the herbarium at Göttingen which I have seen. In both of these specimens the central axis of the inflorescence is not well developed. Lindau considered the inflorescence a panicle and placed the species in his section *Eucoccoloba* on this basis. I have now seen the specimens cited above and numerous plants in the field and agree with Lindau and Fawcett & Rendle that the inflorescence should be considered a panicle in that the central axis is dominant in most specimens but can be weak and less conspicuous than the basal branches in others. The dominance of the basal branches seems exaggerated in the fruiting condition with the weight of the mature fruit on the inflorescence diminishing the evidence of the panicle form.

Lindau's elaborate description of *C. plumieri* is confused through his failure to recognize the functionally unisexual condition of the flowers. Both staminate and pistillate flowers have been seen in the field and are represented in the collections cited. Few of the staminate flowers are

clustered and the pistillate flowers are always solitary at the nodes. Flowers of both sexes are articulated to the pedicels. The staminate flowers dehisce from the pedicels after shedding the pollen and the pedicels remain small. The pedicels of the pistillate flowers, however, increase slightly in length and thickness as the fruit develops until at maturity they are several times the length of the ochreolae. Grisebach emphasized with italics in the original description the "pedicels jointed at the base." Examination of the specimens in the Herbarium at Göttingen indicates that Grisebach had confused the scar left by the deciduous ochreolae for an articulation at the base of the fruit-bearing pedicel. While the pedicel bearing the fruit is smaller at the basal end, there is no true articulation present at that point.

Harris has suggested the common name of wild grape for this plant in the vicinity of Soho, St. Ann. I have not found a common name in legitimate use in the areas where I have collected specimens. The few fruits seen in the field were dark purple in color and astringent to taste.

A collection by Gerrit S. Miller was identified as *Coccoloba rugosa*, but should be referred to the present species. The specimen is sterile and was collected apparently from a fast-growing shoot. The single leaf available is suborbicular in shape and 32 × 32 cm. long and broad. Adventitious shoots were seen on several large trees on the Moorlands Estate and younger plants with fast-growing branches and leaders were also abundant. In all of these specimens studied in the field, the shape of the leaves on these fast-growing shoots tended to be broadly ovate to oblong-elliptical. Typical leaves from these shoots reached 40 × 20 cm. in size.

Fawcett & Rendle described a specimen collected by Purdie in 1844 in the interior of Westmoreland as *Coccoloba polystachya* var. *jamaicensis*. The specimen is from a staminate plant and can be referred without hesitation to *C. plumieri* Griseb.

2. Coccoloba proctori, sp. nov.

Frutex, ramulis crassis teretibus; nodis non tumescentibus; ochreis membranaceis, glabris, 10–17 mm. longis, ad basim persistentibus coriaceis, ad apicem obliquis, membranaceis; petiolis crassis, 2–3 cm. longis, glabris; lamina ovata vel elliptici-ovata, 17 × 12 vel 19 × 15 cm. longa et lata, apice obtusa, basi late cuneata vel rotundata, glabra, coriacea, nerviis primariis 4 vel 5, arcuatis inconspicue anastomosantibus; inflorescentibus terminalibus, paniculatis, ♂ ad 15 cm. longis, fructibus ad 25 cm. longis; floribus ♂ 2–4 per nodulum, floribus ♀ 1 per nodulum, rhachi glabra, bracteis 0.5 mm. longis, ochreolis membranaceis 1 mm. longis, pedicellis floriferis 3–4 mm. longis, pedicellis fructiferis 5–6 mm. longis; fructu globoso, 1 cm. diametro, lobis perianthii basi subcoronata, hypanthii 13–15 vascularibus cristis, basim versis rotundata, substipitata. Achenia pallida fulva.

Tree, branches stout terete, nodes not swollen; ochreae 10–17 mm. long, glabrous, membranaceous above and deciduous, coriaceous and persistent

below, oblique and slightly bilobed; petiole inserted at the base, petiole stout, 2–3 cm. long, glabrous, blade ovate to elliptical-ovate 17 × 12, 19 × 15 cm. long and broad, apex obtuse, base broadly cuneate to rounded, glabrous, coriaceous, primary veins 4–5 pairs, arcuate, inconspicuously anastomosing; inflorescence terminal, paniculate, staminate to 15 cm. long, fruiting to 25 cm. long, glabrate, staminate flowers in clusters of 2–4, pistillate flowers solitary, bracts less than 0.5 mm. long, ochreolae less than 1 mm. long; flowering pedicels 3–4 mm. long, glabrate, fruiting pedicels 5–6 mm. long; fruit globose, 1 cm. diameter, fruiting perianth with 13–15 vascular ridges, slightly coronate at the apex, base rounded, very slightly stalked, achene tan.

St. Elizabeth: Wooded area on limestone outcrop near Pit 101 of Kaiser Mines, south of Gutters, *Howard and Proctor 14555* (A, IJ), *15718* fruit (TYPE A), *14719* ♂ (A).

Several plants are known of this new species, but it has been found on only two limestone outcrops in the valley south of Gutters. The two largest trees were 50 and 65 feet tall and three feet in diameter at breast height. One of these has been collected in fruit twice (December and January) and the other has not been found in fertile condition. The collection *14719* was a slender tree 30 feet tall and 6 inches in diameter at breast height. Its perilous position on eroded limestone necessitated felling this tree to collect material and it was the only staminate tree seen. Numerous small trees have been located in this area and vigorous shoots of these, as well as of the larger trees, show the typical larger leaves now expected in this genus on thick shoots. The largest leaves of the adventitious shoots were on petioles of 5 cm. with blades 40 × 25 cm.

This species is named in honor of Mr. George Proctor of the Institute of Jamaica, who has been my companion on many recent field trips in Jamaica. His efforts in collecting have already resulted in making the flora of Jamaica better known.

Coccoloba proctori is similar to *C. plumieri*, differing, however, in the more strict branches of the inflorescence, the globose fruit and the leaves with cuneate bases and fewer veins.

3. **Coccoloba uvifera** L. Syst. Nat. ed. 10, 1007. 1759; Lindau, Engl. Bot. Jahrb. 13: 204. 1890, Symb. Antill. 1: 231. 1899; Fawcett & Rendle, Fl. Jam. 3: 119. 1914.

Polygonum uvifera L. Sp. Pl. 365. 1753.
Guaiabara uvifera (L) House, Am. Midl. Nat. 8: 64. 1922.

Tree of strand areas, 2–15 m. tall; branches terete, stout, papillose to pilose, the nodes not tumid; ochreae rigid, coriaceous at the base, membranaceous at the apex, 3–8 mm. long, puberulent to pilose; petioles stout, 7–10 mm. long, papillose to pilose; leaf blades orbicular to reniform, 6 × 8, 11 × 13, 13 × 18 cm. long and broad, thick and fleshy when fresh, coriaceous when dry, glabrous and minutely punctate on both surfaces, the

midrib and primary veins prominent on both surfaces, frequently brightly colored when fresh, the primary veins 3–5 pairs, usually straight, bifurcate and weakly anastomosing near the margin, commonly barbate in the axils of the basal veins, secondary venation minutely reticulate or obscure; apex rounded, truncate or emarginate, the base rounded to broadly cordate, one lobe often extended around the petiole; leaves of adventitious or fast-growing shoots usually variable in size and shape, but commonly obovate; inflorescence stout, 15–13 cm. long, rachis puberulent; staminate flowers in clusters of 1–7, the pistillate flowers solitary, the bracts ovate, 1–1.5 mm. long, 2 mm. broad, puberulent, the ochreolae membranaceous, 1 mm. long, puberulent, the flowering pedicels 1–2 mm. long, the perianth yellow-white or greenish, the hypanthium 2–3 mm. long, the perianth lobes 4 mm. long, 3–4 mm. wide, the fertile stamens to 4 mm. long; fruiting pedicels 3–4 mm. long, the fruit obpyriform, 1.2–2 cm. long, 8–10 mm. in diameter, narrowed at the base, rounded-truncate at the apex, the perianth lobes appressed against the apex of the achene, perianth rose-purple when mature, the achene black.

DISTRIBUTION: General along beaches of Florida, Bermuda, the Bahamas through the Caribbean area to South America.

Manchester: Alligator Pond, *Miller 1403* (S). **Portland:** Port Antonio, *Fredholm 3039* (US), *Proctor 11884* (IJ), *Shreve 25674* (Wisc.); Bennett Point, *Proctor 11844* (GH); Buff Bay, *Maxon 10337* (S, US). **St. Ann:** *Hunnewell & Griscom 14306* (GH); Runaway Bay, *Pierce 26* (IJ); Dunn's River, *Barkley 22J360* (IJ). **St. James:** Montego Bay, *Maxon & Killip 1639* (A, F, GH, US), *Barry s.n.* (IJ), *Davis s.n.* (Mich.). **St. Mary:** Rio Nuevo, *A. von der Porten s.n.* (IJ). **Westmoreland:** Negril Point, *M. L. Farr s.n.* (IJ). Parish uncertain: Glenwood, *Harris 5978* (F).

LOCAL NAME: Sea Grape, Seaside Grape, Beach Grape. Collected in flower in March. Collected in fruit in September.

As frequently happens with well-known and widely distributed species, *Coccoloba uvifera* has been neglected by collectors in Jamaica and is poorly represented in herbaria. The sea grape, however, is a common and often picturesque component of the strand and beach floras of Jamaica and is probably found in every coastal parish. On the north coast the sea grape has been observed only along the immediate coastline, but on the southern side of the island in the vicinity of Kingston and again on the Lititz savannah in St. Elizabeth, *C. uvifera* has been found growing several miles inland.

4. **Coccoloba swartzii** Meisner, DC. Prodr. 14: 159. 1856; Lindau, Engler Bot. Jahrb. 13: 157. 1890, Symb. Antill. 1: 227. 1899; Howard, Jour. Arnold Arb. 30: 420. 1949, 37: 324. 1956.

Coccoloba barbadensis, authors not Jacq.

Coccoloba diversifolia Fawcett & Rendle, Flora Jam. 3: 115. 1914 and all recent authors not Jacq.

Coccoloba neglecta Fawcett & Rendle, Jour. Bot. **51:** 124. 1913, Flora Jam. **3:** 116. 1914.

Uvifera swartzii Ktze. Rev. Gen. **2:** 562. 1891.

Tree 8 to 20 m. tall; branches terete, the youngest puberulent, becoming glabrate, the nodes slightly tumid; ochreae 10–12 mm. long, the persistent coriaceous basal portion 3–5 mm. long, the upper deciduous portions membranaceous, puberulent or glabrate; petiole attached at the base of the ochreae, glabrous or puberulent becoming glabrate, 10–18 mm. long; leaf blades ovate to elliptic, 7 × 5, 11 × 9, 15 × 7.5 cm. long and broad, coriaceous, usually turning black on drying, glabrous, the apex acute or rounded, the base narrowed, rounded or slightly obliquely cordate; midrib and veins inconspicuous above, prominent to inconspicuous below, the primary veins 6–7 pairs, arcuate, anastomosing, ultimate venation conspicuous reticulate; margin entire, slightly recurved; leaves of adventitious shoots with petioles 1.5–2.5 cm. long, the blades ovate to lanceolate, the apex acute to acuminate, 23 × 8.5 to 45 × 18 cm. long and broad; inflorescence terminal 10–15 cm. long, the rachis glabrous or with glandular exudates, rarely papillose, staminate flowers in clusters of 3–5 with tightly concentric membranaceous ochreolae forming a truncate or flattened cylinder after flowering; pistillate flowers solitary, ochreolae erect in flower, flattened against the rachis in fruit; bracts ovate, 1–1.5 mm. long, ochreolae membranaceous 1–1.5 mm. long, flowering pedicels shorter than the ochreolae, hypanthium 0.5 mm. long, perianth lobes ovate, 1–1.5 mm. long and broad, fertile stamens 1 mm. long; fruit ovoid 8–10 mm. long, 6 mm. in diameter; perianth lobes 1–1.5 mm. long in fruit, coronate; achene dark brown.

DISTRIBUTION: Rare in the Bahamas and Cuba, most abundant in Jamaica and less so in Hispaniola, Puerto Rico, the Virgin Islands, Leeward Islands and Windward Islands south to St. Lucia.

Clarendon: Savoy, *Harris 11639* (C, F, GH, NY, MO, US); Peckham Woods, *Harris 11194* (US, NY); Croft's Mts., *Harris 11219* (F, NY, US). **Hanover:** Quashiba Mt., *Webster & Wilson 5086* (A). **Manchester:** New Green, *Britton 3757* (NY); Mandeville, *Britton 3732* (NY), *3236* (NY). **Portland:** Green Ridge *Eggers 3732* (C); Claverty Cottage, *Harris 5088* (C, US); Mt. Pleasant, Stony Hill, *Harris 11133* (F, NY, US). **St. Andrew:** Long Mt., *Webster 4983* (GH); Hardware Gap near New Castle, *Britton & Hollick 1806* (NY); Clydesdale to Chesterdale, vicinity of Cinchona, *Britton 334* (F, NY); Constant Spring to Bardowie, *Harris 12110* (F, GH, MO, NY, S, US); Port Royal Mts., Content Road, *Harris 5092* (US), *5263* (S, US); Lower Davids Hill, *Harris 5091* (C, US); Liguanea Hills, *Prior s.n.* (NY); Moody's Gap, *Britton 3337* (NY), *3364* (NY); Brandon Hill, *Fawcett 8062* (F, NY). **St. Ann:** Union Hill near Moneaque, *Howard 12031* (GH), *12022* (GH), *12013* (GH), *Prior s.n.* (NY); Mt. Diablo, *Hunnewell 19335* (GH); Lydford P.O., *Howard and Proctor 13536* (A, IJ), *13544* (A, IJ), *14586* (A). **St. Catherine:** Juan de Bolas, *Proctor 7146* (IJ); Holly Mount, *Harris 8901* (NY); Charlton, *Harris 6699* (F, NY); Bogwalk, *Proctor 8185* (IJ). **St. Elizabeth:** Malvern, *Howard & Proctor 13722* (A, IJ), *Britton 1195* (NY); Malvern, Bideford District, *Webster & Proctor 5328* (GH).

St. Thomas: Big Level, John Crow Mts., *Webster & Proctor 5529* (GH); Bath, *Britton 3492* (NY), *Harris 6055* (F, NY); Green Valley, *Harris 5233* (C, NY), *12126* (F, GH, MO, NY, S, US); Mansfield, *Britton 3556* (NY); Blue Mts., *Harris 5274* (US),*5094* (B, BM — TYPE of *C. neglecta*, C, J, US); Without location, *Britton 3656* (NY). **Trelawny:** Oxford, *Britton 430* (NY); Troy, *Britton 919* (NY), *Harris 90994* (F, NY, US), *Howard & Proctor 14119* (A). Parish uncertain: Cedar Hurst, *Harris 5500* (C); "Portland," *Bancroft 11* (US). Without definite location: *Swartz s.n.* (De Candolle Herb., TYPE, S, NY).

COMMON NAME: Wild grape. Collected in flower in July, August and September. Collected in fruit in January, February, March, September and November.

A full discussion of the polymorphic species *Coccoloba swartzii* has been published as the second paper in this series (Jour. Arnold Arb. 37: 317–339. 1956). The Jamaican populations of this taxon are remarkably uniform, although they do grade into the variations found on other islands. The type of the species, a Swartz collection described by Meisner and located in the De Candolle Herbarium, is from Jamaica.

I cannot understand how Fawcett & Rendle, in their comprehensive treatment of the genus for the Flora of Jamaica, overlooked this species and failed to consider it. The specimens recognized here as *Coccoloba swartzii* were called *C. diversifolia* Jacq. in the Flora of Jamaica.

5. **Coccoloba troyana** Urb. Symb. Antill. 6: 8. 1909; Fawcett & Rendle, Flora Jam. 3: 116. 1914.

Tree of inland areas, generally on limestone, 7–15 m. tall, commonly branched from the base with several trunks; ultimate branches terete, glabrous with nodes only slightly enlarged; ochreae cylindrical, 10–13 mm. long, glabrous, membranaceous, almost completely deciduous; petioles attached at the base of the ochreae, 1.5–2 cm. long, glabrous; blades cordate-ovate to ovate-elliptic, 7 × 4.5, 8 × 6, 9 × 6, 10.5 × 8 cm. long and broad; apex short acuminate, the base cordate; margin entire, flat, chartaceous, drying buff or tan; midrib and primary veins inconspicuous to prominent on both surfaces, arcuate, anastomosing; primary veins 6–9 pairs, the secondary venation reticulate on both surfaces, glands few, inconspicuous; inflorescence terminal, 5–9 cm. long, generally shorter than the leaves, the rachis glabrous or with glands, the pedicels decurrent so that the axis is angular, ridged and grooved; bracts broadly ovate, less than 1 mm. long, glabrous, the ochreolae membranaceous, to 1 mm. long, pedicels glabrous, at most 1.5 mm. long in fruit; staminate flowers 1–3, the pistillate flowers usually solitary, the hypanthium 1 mm. long, perianth lobes oblong-ovate, 1.5 mm. long and broad, the functional stamens 1.5 mm. long; fruit ovoid, 8 mm. long and 5 mm. in diameter, stalked at the base, becoming fusiform to fusiform-ovoid; perianth lobes appressed, 4–5 mm. long, not coronate; achene chestnut brown, shiny.

DISTRIBUTION: Endemic to Jamaica.

Portland: 2½ mi. SW of Ecclesdown, *Proctor 11375* (IJ). **St. Thomas:** John Crow Mts., *Harris & Britton 10764* (F, NY, US). **Trelawny:** Troy, *Harris 9439* (TYPE B, F, NY, US), *9474* (B, F, NY, US), *10653* (C, F, NY, US), *Britton 600* (F, NY, US), *639* (NY); Ramgoat Cave, *Howard and Proctor 14142* (A), *14383* (A, IJ), *Howard, Proctor & Stearn 14659* (A), *Proctor 10616* (IJ).

Collected in flower in March. Collected in fruit in September and November.

This species is easily recognized even in sterile condition by the cordate leaf shape, the long, pale buff petioles and the buff or tan blades. The angular inflorescence axes with the decurrent pedicels mark the species in flowering and fruiting condition. Despite these apparent characters, the species appears to be very similar to some specimens of *Coccoloba krugii* and it is possible that further collections will show complete transition between the two. Attempts to germinate the seeds of *C. troyana* and *C. krugii* have not been successful and the cytological relationship of these species is not known. There is a possibility that *C. troyana* may be a polyploid race of *C. krugii*.

Urban's original description has not been significantly altered by Fawcett & Rendle. More recent collections show that Urban examined only a fragment of the ochreae and that his report of ochreae 3 mm. long is erroneous.

I have seen a dozen specimens of *C. troyana* in the field between Troy and Kimloss in the Cockpit country. Each specimen was in an isolated and sparsely populated area and was not cut or injured. There were neither trauma-induced adventitious shoots nor spontaneous ones and the nature of the larger leaves generally characteristic of juvenile and fast-growing shoots is not known for this species.

The collection by Harris and Britton from the John Crow Mountains, presumably the southern shoulder of this range, extends the known range of the species in Jamaica from the center at Troy to the opposite and eastern end of the island. The specimens collected by Harris and Britton are in full bud or young flowers and appear to agree in all characters with the more numerous material from Trelawny. More recent collections by Proctor from the John Crow Mountains above Ecclesdown are sterile. I have seen the plants in this area and believe they are correctly assigned here.

6. **Coccoloba krugii** Lindau, Engl. Bot. Jahrb. 13: 145. 1891, Symb. Antill. 1: 222. 1899; Fawcett & Rendle, Flora Jam. 3: 115. 1914.

Coccoloba børgesenii Schmidt, Fedde Repert Sp. Nov. 24: 75. 1927.
Coccoloba børgesenii forma *ovato-lanceolata* Schmidt, Fedde Repert Sp. Nov. 24: 76. 1927.

Shrub or small tree to 6 m. tall; branches terete, glabrous, slightly nodose; ochreae membranaceous, persistent, 3–5 mm. long, petiole attached at the base of the ochreae, 5–6 mm. long; leaf blade ovate, subor-

bicular, 2 × 1.8, 2.5 × 2.5, 4 × 3.5 cm. long and broad, the apex obtuse or rounded, the base cordate or rounded, thin coriaceous, entire, flat or recurved margin, glabrous or rarely with a few hairs near the attachment of the petiole, the midrib flat above, slightly prominent below, the secondary venation minutely reticulate below, smooth above; adventitious shoots with ochreae to 1 cm. long, petioles on shoots to 1 cm. long, the leaf blades generally elliptic, 6 × 4, 7 × 6 cm. long and broad; inflorescence terminal, 5, 6, 8 cm. long, the rachis glabrous, the bracts broadly ovate, membranaceous, less than 1 mm. long, the ochreolae membranaceous, less than 1 mm. long, the pedicels shorter than the ochreolae; pistillate flowers solitary, the staminate flowers 1 or 2 at a node on the axis, hypanthium 1 mm. long, the perianth lobes ovate, 2 mm. long, the fertile stamens 1–1.5 mm. long; fruit ovoid or fusiform, generally 3-angled, 4–5 mm. long, 3–3.5 mm. in diameter, the perianth lobes appressed, about half the length of the fruit; achene dark brown.

DISTRIBUTION: Bahamas, Hispaniola, Jamaica, Puerto Rico, the Virgin Islands and some of the Leeward Islands.

Clarendon: Portland Ridge, *Lewis 52* (IJ), *80* (IJ), *Webster 5122* (GH). **St. Andrew:** Lower Valley Cave River, *Proctor 10208* (IJ); Long Mt. on road to Wareka, *Harris 10008* (F, NY, US), *10014* (F, NY, US), *Maxon 10521* (GH, NY, S, US), *Webster 5002* (GH); Long Mt., *Howard 12033* (G), *Webster & Wilson 4861* (GH). **St. Catherine:** Great Goat Island, *Harris 9335* (A, F, NY, US). **St. Elizabeth:** Lovers Leap, Santa Cruz Mts., *Britton 1149* (NY); Yardley Chase, *Harris 9667* (B, F, NY, US); Southfield, *Proctor 11337* (IJ). **St. Thomas:** Albion Mt., *Harris 11690* (F, GH, MO, NY, US), *11681* (F, GH, MO, NY, US). **Trelawny:** Ramgoat Cave, *Howard and Proctor 14395* (A, IJ), *Howard, Proctor & Stearn 14683* (A).

COMMON NAME: Big Family, Crabwood. Collected in flower in July. Collected in fruit in February and March, June, July, August, September and November.

A conspicuous taxon easily recognized in the field and in the herbarium by the ashen gray petioles and ochreae, the yellowish brown or tan leaves and the strongly triangular fruit.

The two Harris collections from Albion Mountain, *11680* and *11681,* were presumably made at the same time and place and probably from adjacent trees which looked different. The second collection consists of specimens distinctly short pilose on all parts and with the leaves rounded and emarginate at the apex. This is the most exaggerated pubescent condition seen in the species, although the same leaf shape has been found with all transitions. The Harris collection from Great Goat Island, *9335*, probably showed the greatest variation in the sheets available for study. Other workers had previously and erroneously labelled several of these sheets *C. pyrifolia.*

7. **Coccoloba tenuifolia** L. Syst. Nat. ed. 10, 1007. 1759, Amoen.

5: 397. 1760, Sp. Pl. ed. 2, 524. 1762; Fawcett & Rendle, Flora Jam. 3: 119. 1914, Jour. Bot. **51**: 124. 1913.

Coccoloba leptostachyoides Lindau, Engl. Bot. Jahrb. **13**: 207. 1890.

Coccolobis ? frutescens, foliis subrotundis, fructu minore trigone Brown, Hist. Jam. 210, *t. 14, f. 3.* 1756.

Coccoloba excoriata L. Syst. Nat. ed. 10, 1007. 1759; Fawcett & Rendle, Flora Jam. 3: 121. 1914.

Coccoloba bahamensis Britton, Bull. N.Y. Bot. Gard. **4**: 116. 1905, as *Coccolobis.*

Shrub, rarely a small tree 6 to 15 feet tall; branches terete, light brown in color, glabrous or puberulent; ochreae membranaceous above and deciduous, coriaceous and persistent below, puberulent; the leaves characteristically borne on lateral shoots and crowded, the petioles short persistently puberulent, 6–9 mm. long, arising from a conspicuous base above the base of the ochreae, the blades generally elliptic, occasionally obovate, oval, oblong or sublanceolate, 3.5 × 2, 7 × 4.5, 8 × 6, 9.5 × 6 to 12 × 10 cm. long and broad, membranaceous to subcoriaceous, the apex acute, short acuminate or rarely obtuse, the base narrowed and unequally rounded to subcordate, the margin entire to undulate, the blade often conspicuously umbonate in the field; midrib and veins flat or impressed above, prominent beneath, primary veins 4–6 pairs, arcuate, the ultimate venations finely reticulate, glabrous above, finely puberulent below, generally tomentose in the axils of the veins and extending on to the lamina persisting or evident as clear hair bases; adventitious shoots with leaves evenly distributed, petioles 2–5 cm. long, the blades 7 × 9 to 18 × 16 cm. long and broad; inflorescence terminal from the lateral leafy shoots, to 8 cm. long, weak and hanging generally strongly curved, the rachis puberulent becoming glabrate; staminate flowers 1–4 at the node, the pistillate flowers usually solitary, bracts broadly ovate, to 0.5 mm. long, the ochreolae membranaceous, 0.5 mm. long, the pedicels 1 mm. long, the hypanthium 1–1.5 mm. long with apparent basal stalk more conspicuous in the pistillate flower, the perianth lobes 1–1.5 mm. long and broad, the functional stamens 1–1.5 mm. long, the functional pistil 1.5 mm. long; fruiting pedicels 1–1.5 mm. long, the fruit ovoid 5–6 mm. long and 4 mm. in diameter with a short stalk 0.5 mm. long, the perianth lobes appressed, the achene tan in color.

DISTRIBUTION: Bahamas, Cuba and Jamaica.

Manchester: Spur Tree Hill, *Britton 1064* (NY), *1665* (NY), Marshall's Pen, *Britton 3706* (NY). **St. Andrew:** Green Valley, *Harris 5391* (US), *12129* (F, GH, MO, NY, S, US); Long Mountain, *Harris 8862* (F, NY, US), *Britton 810* (NY), *Howard 12034* (GH), *12035* (GH), *Webster & Wilson 4880* (A), *4890* (A); Mona, *West & Arnold 559* (GH), Berwick Hill, *Harris 5343* (F, US), *6517* (B, F, NY), *Perkins 1194* (A, GH). **St. Ann:** Falls River, *Harris 5228* (Leiden, US). **St. Elizabeth:** Malvern, *Harris 9808* (F, NY, US); Potsdam, *Britton 1264* (NY); Shooters Hill, *Howard & Proctor 14106* (A); Hampton School, *Webster & Proctor 5307* (GH). **St. Thomas:** Blue Mts., *Harris 5272*

(US); Morant Bay, *Barry s.n.* (IJ). **Clarendon:** Portland Ridge, *Howard 12010* (GH). **Trelawny:** Ramgoat Cave, *Howard & Proctor 14143* (A), *14420* (A). Location uncertain: *March 1989* (TYPE of *C. leptostachyoides*, B, Gott.); *Swartz s.n.* (S), *Hart s.n.* (F, NY). Linnaean Herbarium types of *C. tenuifolia* and *C. excoriata* (Patrick Browne).

COMMON NAME: Wild grape. Collected in flower in July, August, September. Collected in fruit in January, February, August, September, October and November.

Fawcett & Rendle have made the greatest contribution in straightening out the nomenclature of this species which has been confused for many years.

Lindau, the earliest monographer of the genus *Coccoloba*, apparently never saw the specimen of *Coccoloba tenuifolia* L. in the Linnaean Herbarium. Lindau refers only to the description in Linnaeus's Amoenitates Academicae 5 in citing this species in a category of uncertain species (Engl. Bot. Jahrb. 13: 220. 1890). The Linnaean specimen is in excellent flowering condition and is easily recognized. Lindau, however, described two species from Jamaica, *C. jamaicensis* and *C. leptostachyoides* which Fawcett & Rendle consider identical and synonymous with *C. tenuifolia*. I agree only in part with this conclusion, as I consider *C. jamaicensis*, as based on a March specimen, a hybrid and the same as *C. litoralis* Urban.

There remains one species, *Coccoloba excoriata* L., to be disposed of properly before the terminology of this taxon can be considered stable. Linnaeus based *C. excoriata* on a Patrick Browne specimen which is today in the Linnaean Herbarium. As Fawcett & Rendle report in reviewing this species (Jour. Bot. 51: 123. 1913 and Flora Jam. 3: 121. 1914), the specimen labelled *C. excoriata* in Linnaeus's handwriting is a "stout shoot, apparently a young sucker 14 cm. long and 0.5 cm. thick with white bark and brown lenticels; leaves 7.5–10 cm. long, 6–7 cm. broad, broadly elliptical, very shortly acuminate, base sometimes unequal, rounded, nerves on both sides prominulous, veins inconspicuous, dark brown on upper surface, light brown beneath; petioles and ochreae puberulous; ochreae dark brown, broadly tubular, 1 cm. long, permanent base 5–7 cm. long, leaf inserted about the middle of the permanent base."

Fawcett & Rendle sought to identify this species through the common name of "The Mountain Grape Tree" supplied by Patrick Browne and, being unsuccessful, left this taxon as "species insufficiently known" in the Flora of Jamaica. Lindau completely misinterpreted the description and considered *C. excoriata* the same as *C. nivea* Jacquin. He placed the species as a synonym in the section *Campderia*. *Coccoloba nivea* Jacquin is now known as *C. venosa* L. and is a very distinct species.

To identify *C. excoriata* L. it is necessary to consider the adventitious shoots of the common species of *Coccoloba* in Jamaica. I have a collection of such shoots made over a period of five years representing most of the species of the genus known from the island. The specimens which agree most closely with Linnaeus's description and the specimen in the Linnaean Herbarium were collected on Long Mountain just outside of Kingston and

are *Howard 12034, 12035, Britton 810* and *West and Arnold 559*. A Harris specimen, *6517*, from Berwick Hill also matches the sterile Patrick Browne specimen. The vegetation on the dry hillsides of Long Mountain is cut with regularity for fuel and the stumps which produced the adventitious shoots here considered are referable in fertile condition to *C. tenuifolia*. There is no doubt that the Patrick Browne specimen of "The Mountain Grape Tree" and the type of *C. excoriata* is an adventitious shoot of *C. tenuifolia*. Both of these names are published on page 1007 of Linnaeus's Systema Natural. edition 10, in 1759. As the Linnaean specimen of *C. tenuifolia* is an excellent flowering specimen, it is desirable to select this as the type and to consider *C. excoriata* based on a sterile adventitious shoot as a synonym.

Coccoloba tenuifolia is distinctive in having tenuous and characteristically curved inflorescence axes. The clustering of the leaves on short lateral branches gives this taxon a distinctive appearance in the field. The swollen ochreae bases, heavily veined near the attachment of the petiole, are also of diagnostic value.

Anomalies have been seen in this species, also, with fasciated and branched inflorescences relatively common. In one specimen the inflorescence axis is thin at the base, becoming flattened and broad about the middle of its length and dividing into ten branches near the apex. The flowers in the Perkins specimen (*1194*) are monstrous in size and the stamens, numbering from four to seven in various flowers examined, are variously united.

8. **Coccoloba longifolia** Fischer ex Lindau, Engl. Bot. Jahrb. **13**: 161. 1890; Ettingschausen, Denkschriften K. Acad. der Wissenschaften, Vienna **15**: *229, tab. 27, fig. 2*. 1858; Fawcett & Rendle, Flora Jam. 3: 117. 1914.

Coccoloba venosa Griseb. ex Lindau, Engl. Bot. Jahrb. **13**: 152. 1890, not Linnaeus.

Coccoloba venosa major Lindau, Engl. Bot. Jahrb. **13**: 152. 1890.

Coccoloba rumicifolia Britton, Bull. Torrey Bot. Club **42**: 514. 1915.

Erect shrub, scrambling shrub or tree to 15 m.; branches often scrambling, terete, striate, the nodes not conspicuously swollen; ochreae 4–6 mm. long, obliquely truncate, sparsely to densely short yellow pubescent or glabrate, membranaceous above and evanescent, coriaceous below and persistent, the petiole arising slightly above the base, 14 mm. long, glabrous, puberulent or pilose on the adaxial surface; leaf blades oblong-ovate to sublanceolate-ovate, 7 × 2.5, 8 × 5, 13 × 5, 17 × 7 cm. long and broad, subcoriaceous, glabrous, the margin slightly recurved, the primary veins 6 pairs, arcuate, anastomosing near the margin, the ultimate venation reticulate and evident on both surfaces, the base rounded, cordate or rarely cuneate, the apex obtusely acuminate to long acuminate; adventitious shoots with internodes to 10 cm. in length, ochreae 2.5–3.5 cm. with petiole attached from near the base to about the middle, the petioles to 2.6

cm. in length, the blades ovate, ovate-lanceolate or ovate-elliptic 13 × 9, 21 × 8, 26 × 11, 32 × 12, 40 × 19 cm. long and broad; inflorescence racemose, generally exceeding the leaves, 6, 10, 18, 26 cm. in length, basal ochreae to 6 mm. long, the axis puberulent or glabrate, the bracts triangular, obtuse to 0.5 mm. long, the ochreolae membranaceous generally flaring slightly truncate or obliquely truncate, about 1 mm. long, the pedicels in flower 2 mm. long; staminate flowers 1–4 at each node, the pistillate flowers normally single, rarely 2 at each node, the pedicels and perianth puberulent, the hypanthium campanulate 1–2 mm. long, perianth lobes ovate, generally 2 mm. long and broad; fertile stamens to 2 mm. long; functional pistil 2–3 mm. long; fruiting pedicels 2.5–4 mm. long, fruit bright red, ovoid 10–12 mm. long, 6–7 mm. in diameter, apex slightly turbinate, the base contracted to a short stipe, fruiting perianth conspicuously vascular; achene dark brown or black.

DISTRIBUTION: Endemic to Jamaica.

Clarendon: Leicesterfield, *Harris 10840* (F, GH, NY, US); Peckham Woods, *Harris 10873* (F, GH, NY, US), *11174* (F, MO, NY, US), *12785* (F, MO, NY, US); *Proctor 8227* (IJ). **Hanover:** Kempshot, *Britton 2437* (NY). **Manchester:** Martins Hill near Mandeville, *Harris & Britton 10617* (F, NY, US); New Green near Mandeville, *Harris & Britton 10597* (NY, US), *Harris 6317* (B); Mandeville, *S. Brown 241* (NY). **Portland:** 1.5 mi. SW of Ecclesdown, *Howard, Proctor & Stearn 14778* (A); Swift River District, West Hope Bay, *Harris 6009* (F, NY). **St. Ann:** Union Hill near Moneague, *Britton & Hollick 2736* (NY), *2773* (F, NY), *2777* (NY), *Howard 12029* (GH); Grierfield near Moneague, *Britton 2665* (NY), *2667* (NY); Soho, *Harris 11984* (F, NY, US), *11986* (F, GH, MO, NY, US); Liberty Hill, St. Anns Bay, *Britton 2502* (NY), Mt. Diablo, *Maxon 2219* (NY, US), *Webster & Wilson 5013* (A); Lydford P.O., *Howard & Proctor 13420* (A), *13534* (A), *14579* (A), *Howard, Proctor & Stearn 14600* (A), *Proctor 6397* (IJ), *8642* (A, IJ); Linton Estate near Claremont, *Howard & Proctor 14191* (A); Prickly Pole, *Howard & Proctor 14318* (A). **St. Andrew:** Bogwalk, *Hitchcock s.n.* (MO); Constant Spring, *Campbell 5714* (F, NY). **St. Catherine:** Luidas Vale, *Hunnewell 19334* (GH), *Hunnewell & Griscom 14305* (GH); Hollymount, *Britton 730* (NY), *Harris 6489* (B). **St. Elizabeth:** Pepper, *G.S. Miller 1331* (US); Stanmore Hill, Santa Cruz Mts., *Britton 1308* (NY). **St. Mary:** Gayle, *Proctor 5093* (IJ). **St. Thomas:** John Crow Mts., *Britton 3991* (NY), *Harris & Britton 10689* (F, NY, US), *10758* (F, NY, US), *10756* (F, GH, NY, US); Big Level, *Webster & Proctor 5532* (GH), *5545* (GH); Bath, *Britton 3649* (NY), *Howard, Proctor & Stearn 14808* (A); Bachelors Hill, *Britton 3616* (F, NY); Amity Hall Hill, *Harris & Britton 10716* (F, NY). **Trelawny:** Troy, *Harris 8719* (NY), *8772* (NY); between Troy and Oxford, *Britton 680* (F, NY); Oxford, *Harris 9489* (F, NY); Tyre, *Harris 9462* (F, NY), *Britton 545* (NY); Windsor, *G.S. Miller 1475* (US); Hectors River, *Harris 6005* (B), Troy, *Howard & Proctor 14117* (A); Ramgoat Cave, *Howard & Proctor 14146* (A), *14147* (A), *14153* (A), *14393* (A); Burnt Hill, *Barkley, 22J241* (IJ). **Westmoreland:** Negril, *Britton & Hollick 2034* (NY); Beeston Spring to Bog House, *Webster & Wilson 5032* (A); Teague Gulley, Newmarket, *Britton 1592* (TYPE of *C. rumicifolia*, N.Y.), *Harris 9837* (B, F, NY, US). Locality not certain: *Willdenow 7698* (B); *March 1568* (GH), *674* (Gott.)

Swartz s.n. (S), *Hansen s.n.* (NY), *Prior s.n.* (B, GH, NY). **Cultivated:** Hort. Berlin 1828 (US), 1843(B).

COMMON NAMES: Wild Grape, Bastard Cherry. Collected in flower in March, April, May and July. Collected in fruit in December, February, March, April and May.

Lindau in his monograph of the genus supplies the first complete description of *Coccoloba longifolia* and attributes the name to Fischer. He cites as the first publication of his name the reference "Cat. Pl. Razoum. à Gor. p. 25" and notes that it was without description. I was unable to locate any reference to that publication in the United States and am indebted to the staff of the library at the Royal Botanic Gardens at Kew for their assistance in finding this little book. It is, correctly, "Catalogue du Jardin des Plantes du son excellence Monsieur le comte Alexis de Razoumeffsky a Gorenki." This catalogue was compiled by F. Fischer and was published in Moscow in 1812. The name in question was published in a list on page 16, not 25, as "Coccoloba ? longifolio." It is a nomen nudum. Lindau cites further references for this name, the next being H. F. Link in his Enumeratio Plantarum Horti Regii Botanici Berolinensis 1: 386. 1821, where for the first time the plant is credited to English Gardens. No description is given. Steudel in Nomenclator Botanicus, page 210 in 1821 and again in the 1840 edition on page 290 lists this plant under cultivation as "C. longifolia Fisch." To the latter listing is added the information "Hort. Ang." and "Ind. Occ." and a symbol indicating the species is not well known.

In 1858 C. von Ettingshausen in a preliminary work on the interpretation of fossil plant remains (Denkschriften K. Acad. d. Wiss. Wien. **15**: *229, tab. 27, fig. 2.* 1858) gives a brief description of the vascular pattern of the leaves of "C. longifolia Link" and an illustration. It is obvious that the material he studied originated in the Botanical Garden in Berlin bearing the name from Link's catalogue. It would be permissible, but of doubtful value, to consider the description and illustration of Ettingshausen as the first valid publication of the name *C. longifolia.*

Lindau's complete description has been taken as the starting point for this species by Fawcett & Rendle (Flora Jam. 3: 117. 1914), who refer to *C. longifolia* Fisch. ex Lindau. It would be noted, however, that Fawcett & Rendle literally compile a new description and concept for this species, combining as they do two species and one variety recognized by Lindau in one description. The correct citation for this species should probably be *Coccoloba longifolia* Fisch. ex Lindau emend. Fawcett & Rendle. Lindau recognized *C. venosa* which he attributes to Grisebach. It is based on a manuscript name in the herbarium at Göttingen. Two specimens are cited, *March 674* without locality and an Alexander Prior specimen without number from Moneague. However, *C. venosa* Griseb. ex Lind. is a later homonym for *C. venosa* L. Lindau also described a variety *major* for this species based on another Alexander Prior specimen without location or number. I have seen all three specimens cited in the Grisebach Herbarium at Göttingen. Lindau distinguished this species and its variety from his

newly described "C. longifolia Fisch." as having an inflorescence rachis tomentellose, while *C. longifolia* had the rachis glabrous.

The typification of this species is as difficult as the definition. Lindau cites three specimens from Jamaica, *Cuming 49, Purdie* and *Wullschlagel 1389* and a specimen from a locality not indicated on the sheet and collected by "Sivart." This latter specimen according to Lindau is in the herbarium at Leningrad. Although Lindau twice refers to the "Sivart" specimen in his treatments of this species, it seems obvious that this is an error of transcription for "Swartz." One specimen in the herbarium at Stockholm referable to this species bears the annotation "Ind. Occ." and the name "Swartz" written in longhand in such a way that "Sivart" could be implied. Lindau saw this sheet, for it bears his annotation label with the printed date of 1889 and the reference to *Coccoloba longifolia* Fisch. I have seen three of the four specimens cited by Lindau in the first complete description of *C. longifolia*. However, not one of these specimens bears flowers as were described in the original publication of the name. The selection of a lectotype must be deferred until the specimen not seen (*Wullschlagel 1389*) can be located and even then it may be desirable to select a lectotype from a more modern collection.

Fawcett & Rendle broaden the concept of *Coccoloba longifolia* as described by Lindau to include the pubescent forms which Lindau treated as *C. venosa* Griseb. *Coccoloba venosa* var. *major*, the specimens cited by Fawcett & Rendle in the Flora of Jamaica are extremely diverse in the size and shape of the leaves and the amount of pubescence on the stem, ochreae and rachises. Likewise Fawcett & Rendle broaden the concept to allow for more than a single pedicel per node on the inflorescence axis, a character now recognized as sexual. However, since they did not include a discussion, I felt a field study of this species-complex was essential to clarify the differences in these treatments. Between 1950 and 1956 I have had the opportunity of studying *C. longifolia* plants in many parts of Jamaica on five separate trips to the island at different times of the year. Numerous collections were made and cited, but many field observations were not supported with voucher specimens of this relatively common species. I have studied an abundance of living specimens in St. Ann, St. Elizabeth and St. Catherine parishes from near the seacoast at Ocho Rios to altitudes of about 3,000 feet at Griermount. *Coccoloba longifolia* appears to be a weak tree reaching at most a height of 30 feet and occurring often with several erect trunks. The most common occurrence is in cut-over thickets or secondary woodlands. The branches show a tendency toward a scrambling habit. As is true in most species of *Coccoloba*, adventitious branches develop readily following injury and in the case of *C. longifolia*, any distortion of a branch from its normal attitude tends to incite the development of adventitious shoots with longer internodes and larger leaves, petioles and ochreae. As it occurs commonly in disturbed woodlands which are frequently cut for building poles and fire wood, the number of plants with larger leaves considered atypical is greater than the number of plants encountered with smaller and more pubescent leaves and considered

as typical of the species. Collections from the more remote or undisturbed areas of the island of Jamaica tend to exhibit the smaller leaf size and the more abundant phases of pubescence. Thus, collections by Harris (*9462*) and Britton (*545*) from Tyre near Troy in the Cockpit Country, Harris (*12785*) from Peckham Woods and Prior (*s.n.*) from Moneague exhibit what Lindau considered as *C. venosa* Griseb. var. *typica*. It is interesting that an older collection by A. S. Hitchcock (Dec. 17, 1890) from Bogwalk, an historic location, shows the same characteristics, but has never been re-collected in this area. Of the many living plants of this species seen along the gorge of the Rio Cobre below Bogwalk, all illustrate the more rampant growth form. I likewise revisited the Moneague area, particularly Union Hill, where Britton and Hollick (*2773*) in 1908 collected the same growth form of *C. longifolia* as did Prior. In the protected forested area I was able to find specimens which duplicated the earlier collections, but at the edge of clearings and in areas of regrowth the full range of variation was found, from small and pubescent leaves with short inflorescences to large and essentially glabrous leaves with long inflorescences. These variations were found on many occasions and often on one plant (*Howard 12029*, GH). The most striking contrast on one tree was found in the Claremont area of St. Ann, where specimens were made (*Howard 14191*, A) of a single tree which had one shoot showing normal growth form and many adventitious shoots from the base and from stumps of other branches, showing the full range of variation.

One can conclude from a careful field study that *C. longifolia* is a common species showing considerable variation in leaf size, shape, texture and venation pattern and in the length, thickness and pubescence of the inflorescence, as well as the length of the pedicels. Anomalous inflorescence axes are to be expected in this species, for field study showed elephantine development producing rachises which were longer than the leaf and which, on drying, were 5–7 mm. thick while on the same branch another inflorescence axis might be ¼ to ¾ the length of the leaves, but extremely thin and delicate. Several of the thicker inflorescence axes were branched at the apex, as in *Harris 9489*, indicating a teratological development.

Coccoloba rumicifolia described by Britton and based on a collection (*1592*) he made while collecting with Harris (*9837*) at Teague Gulley near New Market (published incorrectly as "Tea Gulley") represents the more fragile aspect of *C. longifolia*. The plants, described by Britton as three meters tall and growing on a wooded hillside, have membranaceous leaves as well as weak, short inflorescence axes with short pedicels. There is no doubt that this species should be referred to the synonymy of *C. longifolia*.

There remains some question as to why this species was in cultivation in the gardens and greenhouses of Europe in the early nineteenth century. Certainly the plant does not have the horticultural possibilities of *Coccoloba uvifera*, *C. rugosa* or *C. pubescens* which were in cultivation at the same time. The oldest horticultural herbarium specimen known to me is currently in the U.S. National Herbarium (*617174*). This specimen is labelled

"*Coccoloba longifolia* Hort. Angl." and "ex. hort. bot. berol. 1828", thus agreeing with the citation of Link's catalogue of 1821. The erroneous annotation "28 Cocc. caracasana Meisn." in an unidentified handwriting is also on the label. The specimen was sent from the Botanic Garden at Berlin to the Herbarium of the Bureau of Science in Manila and eventually was transferred to the U.S. National Herbarium. It is interesting to note that this specimen bears Lindau's annotation label of 1889. In the herbarium of the Berlin Botanical Garden there is another specimen apparently cultivated under the name of *Coccoloba barbadensis* which was growing in the garden at Berlin in May 1843. This specimen was annotated by Lindau as *C. longifolia*. There is also a specimen of *C. longifolia* in the Kew Herbarium bearing the information, "Hort. Kew 1857." Although Lindau annotated all of these sheets, he did not cite them in his monographic treatments of the genus. All three specimens represent the fast-growing aspect of the species with larger, thin leaves and long, slightly puberulent rachises. All are pistillate specimens, raising the question of how these early cultigens were propagated if they did not all come from the same seed lot. If the latter is true and these were all one seed collection, then further unanswered questions are raised regarding the inheritance of sex in these dioecious plants.

9. **Coccoloba diversifolia** Jacq. Enum. Pl. 19. 1760, Hist. Stirp. Amer. 114, *pl. 76*. 1763; Howard, Jour. Arnold Arb. **30**: 421. 1949.

Coccoloba laurifolia Lindau, Engl. Bot. Jahrb. **13**: 158. 1891, Urban, Symb. Antill. **1**: 227. 1901; Fawcett & Rendle, Flora Jam. **3**: 116. 1914 and all recent authors, not Jacquin.

Coccoloba longifolia Schmidt, Fedde Rep. Sp. Nov. **24**: 73. 1927, not Fischer.

Guaiabara laurifolia House, Am. Midl. Nat. **8**: 64. 1922 (as Guaibara).

Shrub or small tree to 7 m. tall; branches terete, often geniculate by limited growth, glabrous, the nodes rarely slightly tumid; ochreae coriaceous in the persistent lower portion, membranaceous and deciduous above, 3–5 mm. long; petioles 7–10 mm. long, glabrous; leaf blades ovate, oblong, elliptic, lanceolate or obovate, variable on a single shoot, the apex rounded, obtuse, acute or acuminate, the base cuneate to rounded or subcordate, 4 × 3.5, 7 × 5.5, 8× 4.5, 12 × 8 cm. long and wide, coriaceous, often shining above, dull beneath, glabrous, the midrib and primary veins slightly prominent above, the secondary venation reticulate on both surfaces, the primary veins 3–7 pairs, arcuate, anastomosing before reaching the margin, the margin entire, commonly slightly recurved; leaves of adventitious shoots similar in shape to those of normal growth but larger in size, 17 × 8, 24 × 13, 32 × 12.5 cm. long and wide on petioles 1–2.5 cm. long; leaves of windswept specimens often much smaller than those of normal shoots, 2 × 1.3, 3 × 2 cm. long and wide; inflorescence terminal 4.9, 9, 11 to 18 cm. long; rachis glabrous; staminate flowers in clusters of 2–5, the pistillate flowers solitary; bracts ovate, less than 0.5 mm. long, 1 mm. broad, glabrous; ochreolae membranaceous, less than 0.5 mm. long, glabrous, the

flowering pedicels 2–4 mm. long, glabrous; hypanthium 1 mm. long, the perianth lobes 2 × 2, to 3 × 1 mm. long and broad, filaments of functional stamens 1 mm. long, fruiting pedicels 3–4.5 mm. long; fruit globose to obpyriform 10 × 7, 12 × 8, 13 × 8 cm. long and thick, perianth lobes appressed at the apex of the achene.

DISTRIBUTION: Florida and the Bahamas, through the West Indies to South America.

Clarendon: Portland Ridge, *Howard 12004* (GH). **St. Andrew:** Gordon Town, *Harris 6032* (F, NY, US). **St. Elizabeth:** Pepper, *G.S. Miller 1354* (US), *1365* (US); Malvern, *Howard & Proctor 13689* (A, IJ), *13724* (A, IJ); Gutters, *Howard & Proctor 13821* (A, IJ). **St. Thomas:** Sheldon, *Harris 5093* (US).

Collected in flower in July and in fruit in February and November.

This species, particularly abundant in the Bahamas, Cuba and Hispaniola, is of infrequent occurrence in Jamaica. It is apparently limited to the south coast and specimens were not abundant in the one region, Portland Ridge, where I have collected it. The plant was not known to others of our party and no common name was offered by the residents of the area.

10. **Coccoloba zebra** Griseb., Fl. Brit. W.I. 162. 1859; Lindau, Engl. Bot. Jahrb. **13**: 135. 1890, Symb. Antill. **1**: 220. 1899; Fawcett & Rendle, Flora Jam. **3**: 113. 1914.

Coccoloba harrisii Lindau, Urb. Symb. Antill. **1**: 228. 1899; Fawcett & Rendle, Flora Jam. **3**: 117. 1914.

Coccoloba priorii Fawcett & Rendle, Jour. Bot. **51**: 124. 1913, Flora Jam. **3**: 120. 1914.

Tree to 30 feet tall; branches terete, slender, glabrous; ochreae subcoriaceous, persistent, slender and cylindrical but flaring and oblique at the apex, 8–14 mm. long, glabrous; petiole attached at the base of the ochreae, slender, 11–14 mm. long on normal shoots, glabrous; leaf blades elliptic to elliptic-ovate, 7 × 4, 8 × 6, 10 × 7 cm. long and broad, coriaceous, glabrous, flat, dull turning black on drying, the midrib and primary veins flat above, prominent below, the veins 5–7 pairs, arcuate, anastomosing, the secondary venation densely reticulate, the apex short acuminate, the base rounded to truncate; leaves of adventitious shoots similar in shape, 15 × 9 cm. long and broad on petioles to 2.4 cm. long; inflorescence terminal 5–14 cm. long, the ochreae of rachis flaring, 8 mm. long, puberulent, the rachis puberulent; bracts and ochreolae less than 0.5 mm. long, glabrous or puberulent, the pedicels 1.5–2.5 mm. long, puberulent, the pistillate flowers borne singly, the perianth puberulent, the hypanthium 1.5 mm. long, the perianth lobes 1.5 mm. long and broad, the stamens rudimentary, the pistil 1.5 mm. long; staminate flowers not known; fruiting pedicels 3–4 mm. long; fruit fusiform, 17 mm. long, 8 mm. in diameter; perianth fibrous; achene dark brown.

DISTRIBUTION: Endemic to Jamaica.

St. Ann: Union Hill near Moneague, *Prior 338* (K, TYPE of *C. priorii*, B). **Manchester:** below St. Georges, *Watt s.n.* (NY). **Portland:** 2.5 mi. SW of Ecclesdown, *Howard, Proctor & Stearn 14754* (A); *Webster & Wilson 5133* (A); *Proctor 11371* (IJ); Vinegar Hill, *Harris 5481* (C, BM, TYPE of *C. harrisii*), *7667* (B, BM, F, NY, US). Parish not certain: Blue Mts., *Harris 5089* (B, BM). Locality not certain: *Wilson 168* (Gott. TYPE of *C. zebra*, B, K); *March 679* (Gott.)

COMMON NAME: Zebra wood (ex Grisebach). Collected in flower in July and September. Fruiting date not known. The type specimen of *Coccoloba zebra* is a fruiting branch of a vigorous shoot. The internodes are long and the leaves larger than in the other collections cited. The type specimens of *C. harrisii* and *C. priorii* are shoots of normal growth. It is clear to me that these collections represent one taxon and that *C. zebra*, being the older name, must be used. Lindau distinguished *C. harrisii* from *C. zebra* primarily on the assumption that *C. harrisii* had a glabrous rachis. I have seen all the material Lindau cited and annotated and conclude he was in error on this point.

Fawcett & Rendle do not discuss their new species *C. priorii* in the original description, but in the Flora of Jamaica they distinguish it from *C. harrisii* as having "veins on the upper surface only seen with a lens when dry" while *C. harrisii* has "veins on the upper surface evident." These two species form a section of the key headed "leaves small, not exceeding 8 cm." while *C. zebra* is distinguishable from this section by having "leaves large, exceeding 8 cm." These are not reliable characters.

The specimens cited from the crest of the John Crow Mountains near Ecclesdown represent an extension of the range of the species and unfortunately are sterile. However, the vigorous and normal growth aspects of these bridge the variation expressed in the earlier collections. *Coccoloba zebra* is not adequately known and additional material is needed. Only one fruiting specimen is known and this consists of very old fruit. The fruits are all detached and are in a pocket on the sheet. If the fruits belong with the vegetative parts, the shape of the fruit is an additional diagnostic character for the species. Staminate plants or flowers with functional anthers have not been seen. The specimens recently collected are the only modern collections and as this location is known to botanists in Jamaica, it is hoped that the additional characters can soon be added to this description.

HYBRIDS AND SPECIES EXCLUDED FROM THE FLORA OF JAMAICA

Coccoloba × jamaicensis Lindau (stat. nov.) Engler Bot. Jahrb. 13: 206. 1890, Symb. Antill. 1: 232. 1899.

Coccoloba litoralis Urban, Symb. Antill. 6: 9. 1909; Fawcett & Rendle, Flora Jam. 3: 117. 1914.

Coccoloba leoganensis Griseb. ex Lindau Engl. Bot. Jahrb. **13**: 206. 1890, not Jacquin.

Tree to 13 m. tall; branches terete glabrous, the nodes not conspicuously enlarged; ochreae subcoriaceous, glabrous or with minute puberulence, persistent, the apex oblique, 6–9 mm. long; petiole inserted above the base, stout, 1.5 cm. long, glabrous or minutely puberulent; leaf blades broadly orbicular-ovate, 7 × 6, 11 × 9, 15 × 11, 16 × 12 cm. long and broad, the apex acute or rounded and slightly mucronate; the base rounded to cordate, thin coriaceous, glabrous, sunken glands sparsely distributed above, dense below, these black when dry, the midrib and primary veins prominent on both surfaces, primary veins 5–6 pairs, arcuate, anastomosing, ultimate venation minutely and densely reticulate; margin undulate to entire and flat; inflorescence terminal, solitary or with reduced inflorescence at the base, 12, 18, 35 cm. long, the axis puberulent, the bracts ovate above, 1 mm. long, the ochreolae 1 mm. long, both puberulent, the pedicels 1–1.1 mm. long in flowering condition; staminate flowers 2–4 per node, the pistillate flowers solitary, the hypanthium 1–1.5 mm. long, the perianth lobes 1.5–2 mm. long and broad, the fertile stamens 1.5 mm. long; fruits immature and abortive, stalked and similar in size and shape to those of *C. uvifera*.

DISTRIBUTION: Endemic to Jamaica.

St. Catherine: Great Salt Pond, *C. B. Lewis s.n.* (IJ 3231). **St. Elizabeth:** Slipe district, 2–4 mi. SW of Lacovia, *Howard & Proctor 14509* (A), *14512* (A); 1.5 mi. N of Fullerwood in Black River Swamp, *Howard & Proctor 14508* (A). **Westmoreland:** Negril, *Harris 10228* (B, TYPE of *C. litoralis*, BM, F, N.Y. US), *Britton & Hollick 2057* (NY). Locality uncertain: *March s.n.* (Gott., TYPE, B, GH).

Unfortunately considerable shifting and re-sorting of names is required to establish the correct epithet for this taxon which is now recognized as a hybrid. *Coccoloba jamaicensis* was described by Lindau and one collection, March without number, was cited. Lindau saw two specimens, one in the Grisebach Herbarium at Göttingen and the other in the Krug & Urban herbarium in Berlin. Both of these collections are fragmentary, with the specimen in the Krug & Urban herbarium consisting of one leaf and two pencil tracings. A third specimen of this collection has been found in the Gray Herbarium and is more complete and in better condition than either of the others. After careful comparison of these three collections, I have no doubt of their origin from the same plant. They represent a flowering branch with relatively young leaves.

In his original monograph of the genus *Coccoloba* Lindau was unable to identify *C. tenuifolia* L. and listed this species in a category of uncertainty at the end of his publication. He did describe *C. jamaicensis* and *C. leptostachyoides*, the latter based on a numbered March collection from Jamaica. In a treatment of *Coccoloba* in the West Indies published in 1899 in Symbolae Antillanae, Lindau concluded that his species *C. leptostachyoides*

was the same as his *C. jamaicensis* and listed the former in synonymy. Fawcett & Rendle, in studying the Linnaean species of *Coccoloba* from Jamaica, recognized that *C. tenuifolia* L. "is the species which has been recently described by Lindau as *C. jamaicensis* in Engl. Bot. Jahrb. xiii. 206. 1890." This is the treatment which Fawcett & Rendle published in the Flora of Jamaica and which I followed in a treatment of the genus *Coccoloba* in Cuba (Jour. Arnold Arb. 30: 407. 1949). After having studied the March collection which is the type of *Coccoloba jamaicensis* and having compared it with the March collection *1989*, the type of *C. leptostachyoides*, and the Browne collection in the Linnaean Herbarium, the type of *C. tenuifolia* L., I find it necessary to agree with Lindau that two taxa are represented in the two March collections. *Coccoloba tenuifolia* L. is the same as *C. leptostachyoides* Lindau. *Coccoloba jamaicensis* Lindau, however, based on the March collections cited, is different from *C. tenuifolia* L., but is the same as the material currently recognized as *C. litoralis* Urban.

Coccoloba litoralis as described by Urban was based on specimens collected by Harris at Negril. Harris reported the plant as a tree of 40 feet growing near the rocky seacoast among coconut plantings. Urban's observations compared this new species with *C. polystachya* of South America, *C. laurifolia* Jacq. and *C. verruculosa* of Hispaniola. It is clear after examining the specimens which Urban had for study in Berlin and additional specimens in the field that *C. litoralis* is a hybrid between *C. uvifera*, the common sea grape, and *C. tenuifolia* of the dry coastal areas of Jamaica.

The specimen by Britton & Hollick was collected on the same area, Negril, from the same size tree and in the same condition, during the same period. It is suspected that Britton & Hollick were with Harris on this day and that their collection is from the same tree as the Harris specimen, the type of *C. litoralis*.

In July of 1955 Mr. George Proctor and I had opportunity of collecting in the Black River Swamp area of southern St. Elizabeth parish. Where the one road crosses the Broad River there was a well developed stand of *C. uvifera* of characteristic appearance and scattered among them were trees noticeably different to one familiar with the sea grape. Five or six of these trees were seen, the largest being 25 feet tall. All had the general sprawling habit of the sea grape, but differed in having generally smaller and thinner leaves much more green in color. The inflorescences of these plants were long and tenuous and generally weak and drooping. Both staminate and pistillate plants were seen in flower, but all fruits were either abortive or immature. In fact, the largest fruits seen were on staminate inflorescences and all of these fruits were hollow and obviously sterile. One collection in the herbarium of the Arnold Arboretum (*Howard & Proctor 14509*) was deliberately prepared to show the variation possible on one tree. The branches were selected and mounted to show specimens that looked as much like *C. tenuifolia* and as much like *C. uvifera* as possible. In fact, the specimen cited would key out to *C. tenuifolia* or *C. uvifera* in the key given, but would look unlike the species. Most of

the plants possessed conspicuous adventitious shoots and these and their leaves were thinner in aspect than is typical for *C. uvifera*. Closer study of the herbarium specimens prepared indicates that these specimens are identical with those named *C. litoralis* by Urban. It is clear from field observation of the living plants and from study of the specimens prepared that *C. litoralis* is a hybrid between *C. uvifera* and *C. tenuifolia* and that the correct name for this taxon is *C.* × *jamaicensis* Lind. No specimens of *C. tenuifolia* have been collected from the immediate vicinity of the plants seen in the Black River swamp, although this species was observed about 4 miles away on dry hummocks in the same swamp.

Several populations of hybrids involving *C. uvifera* as one parent are known from the Antilles. In all cases the characteristics of *C. uvifera* dominate those of the other parent in appearance, both of the plant, the habit and the leaves. The inflorescence character, as is the case in *C. litoralis*, is that of the other parent. The fruit in all of the hybrids observed have been sterile, but the specimens seen in the field are relatively numerous. It appears that *C. uvifera* is receptive to cross pollination from other species of *Coccoloba*, but there is some genetic disturbance preventing the formation of fertile fruits and viable embryos.

COCCOLOBA PYRIFOLIA Desf., Fawcett & Rendle, Flora Jam. 3: 114. 1914 (as *C. pirifolia*).

Lindau (Symb. Antill. 1: 222. 1899) refers a Wilson specimen from Jamaica to this species. No locality is known for this specimen. Fawcett & Rendle cite two specimens from the Great Valley in the parish of Manchester collected by Purdie and by Wilson. I cannot determine whether Lindau and Fawcett & Rendle refer to the same Wilson collection. Both George Proctor of the Institute of Jamaica and I have searched and collected extensively in this area and have found only *Coccoloba krugii* in the region. After the publication of the treatment of the genus *Coccoloba* in the Flora of Jamaica, Harris collected additional material which has been referred to *C. pyrifolia*. All such specimens that I have seen from Jamaica I believe to be identified incorrectly and should be referred to *C. krugii*. It seems probable that the Purdie and Wilson collections may also prove to be from adventitious shoots of *C. krugii*. At the present time *Coccoloba pyrifolia* is not known from Jamaica.

COCCOLOBA PUBESCENS L., Fawcett & Rendle, Jour. Bot. 51: 123. 1913, Flora Jam. 3: 118. 1914.

This is a common species of eastern Hispaniola, Puerto Rico and islands of the Lesser Antilles. There are no modern records of this plant from Jamaica. Fawcett & Rendle reported seeing a Wright specimen which I was not able to locate at the British Museum. They also emphasize the fact that Patrick Browne reported this species as common between Kingston and Bull Bay. Browne commented that the plants were of low size, seldom rising above 5 or 6 feet. The area between Kingston and Bull Bay,