

STUDIES IN THE GENUS COCCOLOBA, IX.
A CRITIQUE OF THE SOUTH AMERICAN SPECIES

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THE FIRST SIX PAPERS of this series treated the West Indian species of the polygonaceous genus *Coccoloba*, with the work based largely upon field studies in this area. The seventh paper dealt with the species of Central America and Mexico; the writer has only a slight knowledge of these species in the field, but fortunately had available an unusually large number of collections as well as extensive field notes made by recent collectors. This paper will treat the species of South America. The limitations of this study are greater both from lack of field knowledge and the fewer specimens available. For these reasons, this treatment is probably more conservative than future workers will deem necessary. The goals of this study have been 1) to bring together all records of taxa of *Coccoloba* for South America; 2) to correct existing errors of literature citation; 3) to evaluate and compare published species where possible; 4) to locate the existing type collections; and 5) to select lectotypes of many species. It is hoped that these notes will encourage collectors and botanists in the area to gather complete material of the species and to record adequately the variations so as to allow a better understanding of certain morphological problems. Only then can the monographer prepare complete descriptions and keys for the species in South America.

The earliest comprehensive treatment of the species of *Coccoloba* in South America was prepared by Meisner for the *Flora Brasiliensis* (5(1): 23–44. 1855). Although some species were illustrated, the descriptions in general were inadequate and no keys were given. Specimens cited previously from the Martius herbarium have since been found in Brussels, Munich, and Leningrad, and a few numbers have been widely scattered. Representative specimens of several species attributed to Martius could not be located for this study and in some other species the selection of a lectotype has required very careful comparisons between specimens from several herbaria and published descriptions.

In 1856 Meisner provided a synopsis of the genus for DeCandolle's *Prodromus* (14: 150–171). One might expect that many of the specimens which Meisner cited would be in the *Prodromus* herbarium or in the Delessert herbarium at Geneva, but, unfortunately, very few are represented in either collection. Meisner's personal herbarium, which has been acquired by the New York Botanical Garden, includes specimens of most species of *Coccoloba*. A few of these are small fragments, yet they represent the only existing type material for certain species.

The only complete monograph of *Coccoloba* was prepared by Lindau

and published in 1890 in Engler's *Botanischer Jahrbücher* (13: 106–229). Many adjustments are necessary therefore to bring the specific names into conformity with the present rules of nomenclature. Lindau's descriptions are not models of accuracy, and the key published in the monograph contains so many errors of fact that it is almost unusable. Following the description of a plant, Lindau cited the collector's name and collection number and at the end gave a list of the herbaria in which he had seen the material. In the selection of a lectotype, therefore, it has been necessary to associate the collection with a particular herbarium. The information supplied in this paper should make easier the work of the next monographer who wishes to obtain material for study.

Lindau frequently cited specimens to be found only in the Berlin herbarium. A study of these, annotated by Lindau, has shown them to be fragments of specimens from other herbaria. There is a question whether the holotype is really the Berlin fragment and only specimen the author cited, or the more ample specimen in some distant herbarium which the author may not have seen and did not annotate.

The specimens of *Coccoloba* in the Vienna herbarium were lost or destroyed during World War II. According to Lindau's citations some of the Jacquin material was at Vienna and is no longer available. A very few of the Vienna specimens were photographed before 1940, and prints of these in the herbarium of the Chicago Natural History Museum are the basis for discussion of these names here.

Most existing treatments of the genus have assumed the flowers to be perfect. During field study of the species in the West Indies the author determined that the flowers are functionally unisexual and that the plants are dioecious. Recently Buchinger and Sanchez examined the species found in Argentina and concluded (*Bol. Soc. Argent. Bot.* 7: 251–255. 1959) that one species of *Coccoloba* in that country is truly dioecious, but that the remainder have perfect flowers or are monoecious. Very few collections are cited in their work and none of those was available to me. I have examined many specimens which I assign to these same species from Argentina and find no evidence in the herbarium specimens to support their conclusions. In the specimens which I examined the flowers with conspicuous pistils have small or rudimentary stamens which do not produce pollen. Flowers with large stamens which produce pollen appear to have undeveloped or rudimentary pistils. There were no specimens with pollen-producing flowers and fruits on the same branches. I do not doubt their decision, since it was based on field study of carefully selected material, but I do point out the difficulty of stating definitely the sexual condition in herbarium specimens and the futility of using in a key such contrasting characteristics as plants monoecious or plants dioecious.

The species in the West Indies were studied in the field to determine leaf variation. I found that vigorous terminal shoots, short branches, branches of average growth, and adventitious shoots might all have different sizes and shapes of leaves. This leads one to question Lindau's

descriptions and keys, since he seems to have relied much on the size and shape of leaves and particularly on the shape of the leaf base.

The habit of the plant also was found to be variable in West Indian species. Some are shrubby or tree-like at the base, but with scrambling branches having the appearance of lianas. Thus herbarium specimens consisting of flowering or fruiting branches without adequate habit notes may not be indicative of the true character of the species.

Relatively few of the South American species considered in the following notes are represented by both flowers and fruit. In some cases it has been possible to associate as one taxon certain flowering and fruiting specimens originally described as separate species. When peculiarities of growth can be properly associated with flowering and fruiting specimens additional species will undoubtedly be combined. Throughout the following text I have been conservative in maintaining as distinct species all specimens concerning which there may be some question. When further evidence becomes available, many of these species may be united.

I have been fortunate to have on loan for study the important historical collections of *Coccoloba* from the Botanisches Museum, Berlin, which formed the basis for Lindau's work; the Jardin Botanique de l'État, Brussels, which include many Martius collections; the Botanische Staatssammlung, Munich, also rich in Martius material; the New York Botanical Garden which include recent collections, as well as Meisner's personal herbarium; and the Herbarium of the Department of Systematics and Plant Geography of the Botanical Institute of the Academy of Sciences of the U.S.S.R., Leningrad, which contains so many duplicates of classic collections. I am most grateful to the directors and curators of these institutions for making their collections available for an unusually long period of time. Selected collections have been borrowed from other institutions and I have visited still more herbaria for study. The many courtesies which made this publication possible are much appreciated. The standard abbreviations of Index Herbariorum have been used in this paper.

Species of *Coccoloba* have been reported from every country in South America, with the sole exception of Chile. In the citation of specimens the countries and their subdivisions, as well as the specific localities of collections, are listed in alphabetical order.

Coccoloba acrostichoides Chamisso, *Linnaea* 8: 132–133. 1833; Meisner, *Fl. Bras.* 5(1): 33. *pl.* 13, *fig.* 2. 1855; Lindau, *Bot. Jahrb.* 13: 138. 1890.

Coccoloba rubiginosa Martius ex Meisner, *Fl. Bras.* 5(1): 33. 1855, in syn.

Chamisso did not cite a specimen in the original description, and previous monographers have not indicated a type. There is a specimen in the Leningrad herbarium collected by Sellow and bearing on the label the name "*Coccoloba acrostichoides* N" and the annotation "Hb. Cham." This specimen is probably authentic. A more ample specimen in the Berlin herbarium has a tag which bears the number "1393" attached but lacks

the reference to the Chamisso herbarium. Lindau did not see or cite either of these collections, yet one must be considered the lectotype and I so designate the specimen at Berlin. All other Sellow collections, including those cited by Lindau, are annotated "*Coccoloba acrostichoides* Cham. et Schl."

The illustration in *Flora Brasiliensis* well represents this species. A printer's proof of this drawing is in the Brussels herbarium and the specimen *Claussen* 330 is mounted on the same sheet. There is little similarity between the two, and the illustration appears to be a compilation.

Coccoloba acrostichoides is one of the most distinctive species of the genus, with copious dark-brown pubescence on the lower leaf surface. In leaf shape and in the nature of the inflorescence it is similar to *C. brasiliensis*. The species is not known in fruit and I have not seen any collections more recent than those of Glaziov.

Coccoloba rubiginosa Martius ex Meisner was published in synonymy and has no validity. A specimen at Munich from the Martius herbarium bears this name, but no location or collector is indicated.

Brazil. MINAS GERAIS: Ouro Preto, *Glaziov* 15356 (BR, LE); without specific location, *Claussen* 330 (BR). RIO DE JANEIRO: San Antonio, *Sellow* "B 1393. c 429" (B). LOCATION NOT KNOWN: Herb. *Martius* s.n. (M-type of *C. rubiginosa*), *Sellow* 1251 (B), 1393 (B-lectotype; LE).

***Coccoloba acuminata* HBK. Nov. Gen. 2: 176. 1817.**

Coccoloba acuminata var. *pubescens* Lindau, Bot. Jahrb. 13: 193. 1890.

Coccoloba acuminata var. *glabra* Lindau, *ibid.* 194.

Coccoloba strobilulifera Meisner, Fl. Bras. 5(1): 25. 1855.

I discussed this species in an earlier paper (Jour. Arnold Arb. 40: 185. 1959) when I concluded that the amount of pubescence on the plant varied with the age and the vigor of the specimen. I cannot find any value or significance in the two varieties Lindau published.

A specimen from the Brazilian state of Pará, *Huber* 4393, bears an unpublished herbarium name attributed to Huber. The specimen is clearly referable to synonymy here.

A collection in the herbarium of the University of Wisconsin numbered "45" but without collector was supposedly made in La Lima, Chile. The authenticity is to be questioned as the specimen compares favorably with material from Colombia and Peru.

In addition to the specimens cited below, I have seen material from Guatemala, Honduras, Nicaragua, Costa Rica and Panama (Howard, *loc. cit.*).

Brazil. ACRE: Rio Macauhan, *Krukoff* 5666 (A, LE, M, NY). AMAZONAS: Rio Embira, *Krukoff* 4715 (A, LE, M, NY); Yuruá Miry, *Ule* 5723 (B). PARÁ: Pará, Alto Purus, Ponto Alegre, *Huber* 4393 (F, U). **British Guiana.** Courantyne, *Schomburgk* 1600 (B). **Colombia.** ANTIOQUIA: Río Magdalena, Brazuela de Perales, *Pennell* 3699 (GH). BOLÍVAR: San Martín de Loba, *Curran* 40 (GH), 100 (Y), 211 (Y). MAGDALENA: Río Magdalena near Mompós, *Humboldt* 1479

(Herb. Willd.—type of *C. acuminata*); Río Sevilla, *Record* 9 (A, GH, Y). SANTANDER: Río Magdalena, *Kalbreyer* 1280 (B). LOCALITY NOT SPECIFIED: *Goudot* 3 (B), *Moritz s.n.* (BR, LE, P—type of *C. strobilulifera* and *C. acuminata* var. *glabra*), *Triana s.n.* (B). Ecuador. Balao, *Eggers* 14239 (A, BR, LE, M). Peru. LORETO: lower Río Huallaga, *Llewelyn Williams* 4804 (A). Venezuela. YARACUY: Los Cañizos, plains of Yaracuy River, *Pittier* 8753 (GH). ZULIA: Perija, *Tejera* 253 (GH), *Mocquerys* 845 (P).

***Coccoloba alagoensis* Weddell, Ann. Sci. Nat. III. 13: 260. 1850.**

Weddell based this species on *Gardner* 1389 from the state of Alagoas, Brazil. At present I am unable to determine the relationship of this species to *Coccoloba obtusifolia* Jacq. and *C. peruviana* Lindau. A full discussion will be found under *C. obtusifolia*.

***Coccoloba alnifolia* Casaretto, Nov. Stirp. Bras. 71. 1844.**

Coccoloba populifolia Weddell, Ann. Sci. Nat. III. 13: 257. 1850; Meisner, Fl. Bras. 5(1): 40, pl. 18. 1855; Lindau, Bot. Jahrb. 13: 198. 1899.

Lindau accepted the Weddell name for this species, although he cited in synonymy the epithet Casaretto published several years earlier. Casaretto did not cite a specimen in the original publication, but it seems clear to me that the description and data given are based on his collection numbered 1194. This collection consists of two sheets in the Turino herbarium and I have designated one of them as the lectotype.

There is a possibility that the older epithet *Coccoloba firma* Martius ex Colla (1836) is the correct one for this species. The current difficulty in determining the type of *C. firma* will be discussed under that name.

Brazil. BAHIA: *Blanchet* 1486 (C, G—type collection of *C. populifolia*); *Sellow* 1137 (B), 793 (B). PERNAMBUCO: *Tapera*, *Pickel* 3681 (GH, NY). RIO DE JANEIRO: Tijuca, *Lützelburg* 343 (M); without specific locality, *Casaretto* 1270 (TO), *Gaudichaud* 420 (B, G, P), *Luschnath* 835 (LE), *s.n.* (M), *Martius s.n.* (M), *Riedel* 7 (BR, LE), 673 (LE, M), *Widgren* 719 (BR). STATE NOT SPECIFIED: Copacabana, *Casaretto* 1194 (TO—lectotype of *C. alnifolia*), *Nadeaud s.n.* (P). CULTIVATED: São Paulo Botanical Garden, *Hoehne* 28527 (A).

***Coccoloba arborescens* (Vellozo) Howard, Jour. Arnold Arb. 41: 44. 1960.**

Polygonum arborescens Vellozo, Flor. Flum. 162. 1825, Icones 4: t. 43. 1827. *Coccoloba crescentiifolia* Chamisso, Linnaea 8: 134. 1833, "*crescentiaefolia*." *Coccoloba vellosiana* Casaretto, Nov. Stirp. Bras. 70. 1844. *Coccoloba fasciculata* Weddell, Ann. Sci. Nat. III. 13: 258. 1849. *Coccoloba crescentiifolia* var. *obtusata* Meisner, Fl. Bras. 5(1): 26. 1855.

The previous paper in this series (Howard, *loc. cit.*) contains a discussion of the nomenclature of this species. For the present, the type is considered to be the Vellozo illustration. After a careful study of this species in the field it may be desirable for some future monographer to select a modern specimen as neotype.

Brazil. BAHIA: *Blanchet* 796 (F, NY, P-type of *C. fasciculata*). RIO DE JANEIRO: Praya Grande, *Sellow* s.n. (B, LE, M-type collection of *C. crescentiifolia*); *Glaziou* 143 (BR); *Riedel* 674 (A, BR, P). STA. CATARINA: Hooker Herb. without collector or number (K). STATE NOT SPECIFIED: Copacabana, *Luschnath* s.n. (BR); between San Juan and Rio dos Oistres, *Prince Maxim. Neuwied* s.n. (BR, NY). LOCALITY NOT SPECIFIED: *Claussen* 2013 (G, NY-type collection of *C. crescentiifolia* var. *obtusata*).

Coccoloba argentinensis Spegazzini, *Physis* 3: 176. 1917; Buchinger and Sanchez, *Bol. Soc. Argent. Bot.* 7: 251. 1959.

Coccoloba praecox Herter, *Rev. Sudam. Bot. Montevideo* 10: 38. 1952.

Spegazzini failed to select a type in the original description. He referred to material collected by M. Rigou in 1902 from the station "Margherita," Prov. Santa Fe, and to material collected the following year in Reconquista. Correspondence with several Argentine botanists indicates that the Spegazzini herbarium has been neglected in the past and that some material has been lost. Dr. Maria Buchinger reported that she saw the "type" several years ago but currently there are no specimens of the species in the herbarium of Spegazzini at La Plata and no other herbarium contains such material. As long as there is a possibility that the original material may be located, a neotype should not be selected. In their recent paper Buchinger and Sanchez cite only one collection, *Schulz* 240, which I have not seen. They further consider the species to be endemic to the Chaco territory and to be found only in the provinces of Salta and Chaco, thereby eliminating the locality of the type collection.

The material cited below appears to me to correspond with the original description. *Coccoloba argentinensis* is easily recognized by the small obovate-elliptic leaves, the long fruiting pedicels, and the flowering of the plant before the leaves are fully developed.

Coccoloba praecox Herter was distinguished on these same characteristics but without comparison with the present species. I have examined an isotype and conclude that the reduction of *C. praecox* to the synonymy of *C. argentinensis* is necessary. *Coccoloba praecox* Herter is also a later homonym of *C. praecox* Wright ex Lindau (*Bot. Jahrb.* 13: 142. 1890).

Argentina. CHACO: Fontana, *Meyer* 2517 (F); Las Palmas, *Jorgensen* 2103 (GH, US), 2106 (GH); Resistencia, Colonia Benítez, *Petersen* 3986 (A). JUJUY: Este Hacienda, s. of Jujuy, *Eyerdam & Beetle* 22432 (GH). SALTA: Orán, Manuela Pedraza, *Eyerdam & Beetle* 22647, 22790 (G, GH); Pichanal, *Rodriguez* 1121 (GH, NY); Rosario de la Frontera, Los Baños, *Venturi* 9402 (GH). TUCUMÁN: Capital, Barranca Colorada, *Venturi* 955 (GH), *Schreiter* 1516 (GH); Trancas, Tapia a Roca, *Schreiter* (*Herb. Lillo* 84971 (US), Vipos, *Venturi* 9792 (A, GH, LE). Uruguay. Salto, Arapey, *Herter* (*Herb. Herter* 50852-type collection of *C. praecox*; F, P); Isla Gaspar, *Berro* 3334 (G).

Coccoloba ascendens Duss ex Lindau, *Bot. Jahrb.* 13: 156. 1890.

In a previous discussion of this species (*Jour. Arnold Arb.* 40: 72, 73. 1959), I selected a specimen from Martinique, *Hahn* 1005, in the Berlin

herbarium as the lectotype. The species is well represented in the Lesser Antilles from Guadeloupe south to Trinidad. Lindau (Bot. Jahrb. 13: 156. 1890) cited specimens only from Guadeloupe, Martinique and Brazil. Eyma (Meded. Bot. Mus. Utrecht 4: 110. 1932) mentioned the distribution of the species as "Guyana, Brazil, Guadeloupe, Martinique." I have seen neither the specimens cited from the Guianas (*B.W.* 6560, 6600, and possibly *B.W.* 6490 and 6550*b*) nor those Lindau cited from the states of Pará and Goyaz in Brazil (*Burchell* 8034, 9345 and *Gardner* 3966). On the basis of an unnatural range I question particularly the Brazilian determinations given by Lindau. Future workers with additional material at their disposal doubtless will check the relationship of *Coccoloba ascendens* and *C. sparsifolia*.

***Coccoloba barbeyana* Lindau, Bot. Jahrb. 13: 185. 1890.**

I have examined the single collection cited by Lindau (*Ruiz & Pavon s.n.*, Peru, without definite locality, in the Barbey-Boissier herbarium) and failed to find the holotype or the species distinct in any way from *Coccoloba densifrons* Martius ex Meisner. Although Lindau accepted *C. densifrons* (based on a Martius collection from Ega in the Brazilian Amazon) he did not list the epithet in the key to the species.

***Coccoloba billbergii* Lindau, Bot. Jahrb. 13: 219. 1890.**

Lindau cited "*Coccoloba obtusifolia* Meissn. (non Jacq.)" in synonymy when he described *C. billbergii* based on *Billberg* 204 and 204*a* from Carthagená, implying that Meisner was in error. However, Meisner noted both the similarity of these Billberg collections to *C. obtusifolia*, as described and illustrated by Jacquin, and the discrepancy in the specimens so labeled in the Willdenow herbarium and the reference in the Willdenow catalogue. Lindau chose to interpret *C. obtusifolia* on the basis of the specimen in the Willdenow herbarium and incorrectly to consider *C. obtusifolia* as a species from the West Indies. I have examined the Billberg collections cited by Lindau from the Berlin and Stockholm herbaria. These are correctly associated with *C. obtusifolia* Jacq. as a South American species. *Coccoloba billbergii* Lindau must be considered a synonym of *C. obtusifolia* Jacq.

"*Coccoloba obtusifolia*" as used by Lindau (*loc. cit.* 146, 147) is correctly assigned to synonymy under *C. microstachya* Willd. (Howard, Jour. Arnold Arb. 38: 217-219. 1957).

***Coccoloba blanchetiana* Weddell, Ann. Sci. Nat. III. 13: 257. 1850.**

Weddell cited *Blanchet* 3561, from near Jacobina, Bahia, Brazil (G, P). This species is to be referred to the synonymy of *C. ochreolata* Weddell and will be discussed there.

Coccoloba bolivarana Llewelyn Williams, Trop. Woods 68: 39. 1941.

In a list of the forest trees of Venezuela, Williams refers to "Brusquillo Blanco, *Coccoloba bolivarana* (a new species), a tree about 8 m. high, growing in rocky areas, with a trunk ramified from the base, and bearing a juicy, lustrous black fruit." The species has not been published validly with a Latin description, to my knowledge, and the brief description given above is scarcely to be considered diagnostic in this difficult genus. Specimens in the herbaria of the Chicago Natural History Museum and the Royal Botanic Gardens, Kew, bear this name but attribute it to Standley. The specimens (*Williams 13374*) were collected at El Tigre, Los Garzones, on Río Cuchivero, Bolivar, Venezuela. They cannot be assigned to any recognized species and will be described in a later paper.

Coccoloba bracteolosa Meisner, Fl. Bras. 5(1): 30. 1855.

No type was selected in the original description, but a Martius collection without number from Joazeiro, on the Rio San Francisco, in Bahia, Brazil, has been photographed by other workers in the Munich herbarium and distributed as the type. I am referring this species to the synonymy of *Coccoloba ochreolata* Weddell and will discuss the problem under that name.

Coccoloba brasiliensis Nees & Martius, Nov. Act. Acad. Nat. Cur. 11: 30. 1823; Meisner, Fl. Bras. 5(1): 32. t. 13, f. 1. 1855.

Coccoloba senaei Lindau ex Glaziov, Bull. Soc. Bot. France 58: 571. 1911.

The original description cites first the locality of "X Valos" and then a general littoral distribution in Bahia, "Maragnanum" and Para, the latter attributed to Martius. I have seen no Martius specimens which fit the original description among the material from the Martius herbarium now at Brussels, Leningrad, or Munich. In his treatment of the genus for *Flora Brasiliensis*, Meisner redescribed the species and cited collections by Prince Maximilian and Martius. The illustration in *Flora Brasiliensis* is based on the specimen collected by Prince Maximilian and I select this as the lectotype.

A previous worker, possibly Meisner, has annotated some sheets to indicate a similarity to or a relationship with *Coccoloba rigida* Meisner. (Lindau, not following the homonym rule, accepted *C. parvifolia* Schott 1827, not Poiret 1804, and included in synonymy *C. rigida* Meisner.) Lindau distinguished between *C. brasiliensis* and "*C. parvifolia*" on the puberulent inflorescence axis in the latter species and the glabrous one in *C. brasiliensis*. An examination of the specimens cited below will show that the stem, ocreae, petioles, and frequently the base of the leaf blade are puberulent to short pilose in *C. brasiliensis*. The bracts and ocreolae of the inflorescence are likewise slightly puberulent to glabrous. On the characteristic of pubescence there is scant reason for separating *C. brasi-*

liensis and "*C. parvifolia*." However, the leaves of *C. brasiliensis* are variable in size and shape. In the type, and in the most recent collections, the leaves are thicker in texture and the bases are rounded-cordate, in contrast to those of "*C. parvifolia*." The inflorescence of the type is as compact as that of "*C. parvifolia*" but recent collections show longer, more lax inflorescences in which the ocreolae do not expand with the developing flower buds, and are, in fact, shorter than the bracts in all stages of development. Until these characteristics can be evaluated by field studies it seems desirable to retain *C. brasiliensis* as a species distinct from *C. rigida*.

The several sheets of the collections by Glaziou cited below suggest that the existing descriptions of *Coccoloba brasiliensis* are unsatisfactory and must be changed to accommodate the narrow, lanceolate-oblong leaves of the vigorous shoots and the large, oblong, but sessile, leaves of adventitious shoots. The Glaziou collection without number in the Paris herbarium has some leaves with blades 18 cm. long and 9 cm. wide. The largest leaf on the lectotype is 4 cm. long and 2.3 cm. wide, yet the collections cited below show all intermediates between these extremes.

The phrase "*Coccoloba senaei* Lindau n. sp." is used by Glaziou in a list of determinations of his collections. The brief description "Arbuste sarmenteux, fl. blanchâtres" can scarcely be considered diagnostic in this genus and I consider *C. senaei* to be a *nomen nudum*.

Brazil. MATO GROSSO: Barao de Capanema, Rio Cravary, *Baldwin* 3129 (US). MINAS GERAIS: Conselheiro Mata, *Brade* 13815 (B), 13816 (B); "in deserto Minarum," *Martius* s.n. (M); Rio dos Pedras, Valu, *Glaziou* 19762 (B, LE), 19763 (B, K, LE); Serra do Cipó, *Schwacke* 8005 (B), *Brade* 14841 (B). WITHOUT SPECIFIC LOCALITY: Valos, *Prince Maximilian* 88 (B, BR-lectotype; LE); *Glaziou* s.n. (P).

Coccoloba brasiliensis Sprengel, Syst. Veg. 2: 252. 1825.

This epithet is a later homonym of *Coccoloba brasiliensis* Nees & Martius. The species was based on a Sellow collection from Brazil which I have not seen. The description is not that of a species of *Coccoloba*. It was referred to the genus *Hedyosmum* of the Chloranthaceae by Chamisso (*Linnaea* 4: 36. 1833). I have not determined whether this is the same as *Hedyosmum brasiliense* Mart., recognized by Occhioni in his recent monograph of the genus (*Contribuição ao estudo de família Chloranthaceae com especial referencia ao gênero Hedyosmum* Sw. Rio de Janeiro, 1954).

Coccoloba candolleana Meisner, Fl. Bras. 5(1): 41. 1855.

Meisner based this species on the collection *Blanchet* 1818 from Bahia, Brazil. He noted its similarity to *Coccoloba cordata* Chamisso. I am unable to distinguish the two and so refer *C. candolleana* to the synonymy of the older name, *C. cordata*.

Lindau (*Bot. Jahrb.* 13: 201. 1890) cited *Goudot* 4, from Colombia, in

his treatment of *Coccoloba candolleana*. Several recent collections from Colombia have also been identified as this species. The Goudot specimen in the Berlin herbarium cited by Lindau is a fragment of a larger specimen in the Paris herbarium. A study of the latter sheet clearly indicates that this collection is to be referred to *C. padiformis* Meisner, the type of which is from Caracas, Venezuela.

Coccoloba caracasana Meisner, DC. Prodr. 14: 157. 1856; Howard, Jour. Arnold Arb. 40: 193. 1959.

Coccoloba caracasana f. *glabra* Lindau, Bot. Jahrb. 13: 211. 1890.

Coccoloba cyclophylla Blake, Contr. U.S. Natl. Herb. 20: 238. 1919.

In an earlier paper I discussed the significance of pubescence in this species and cited the collections seen from Mexico and Central America. *Coccoloba cyclophylla* Blake is now added to the synonymy of this species. Blake compared his species, based on *Curran 47*, from Colombia, with one from Hispaniola and concluded that they were distinct. A proper comparison would have been with *C. caracasana* from Venezuela, which is clearly the same.

Colombia. ATLÁNTICO: La Plaza, Juan Mina, *Dugand 643* (Y); Molinero, *Dugand 568* (Y). BOLÍVAR: Castillo Maldonado, *Sessé & Mociño 5430* (F); San Martín de Loba, *Curran 47* (US-type of *C. cyclophylla*; GH, Y). Magdalena, Santa Marta, *Smith 1702* (A, GH); Tucurínca, *Romero 1388* (US). LOCALITY NOT KNOWN: *Moritz 1109* (BR, LE). **Venezuela.** APURE: San Fernando de Apure, *Grisol s.n.* (A, P). ARAGUA: Maracay, *Vögl 1009* (M); San Juan de los Morros, *Alston 6023* (BM). CARABOBO: Between San Joaquín and Mariara, *Pittier 12111, 12112* (G, LE, M); Valencia, *Pittier 8705* (GH). DISTRITO FEDERAL: Caracas, *Vargas 30* (G); *Humboldt 732* (Herb. Willd.); *Bonpland 732* (B-holotype). GUARICO: El Sombrero, *Pittier 11460* (A, G, GH, M), *12367* (M, NY); La Rubiera, *Pittier 12328* (G, M). LARA: Between Yaritagua and Duaca, *Pittier 343* (A, M). MERIDA: Tovar, *Fendler 2053* (GH). YARACUY: Bruzual, *Curran 642* (NY).

Coccoloba carinata Ruiz ex Meisner, DC. Prodr. 14: 150. 1856.

Meisner published this epithet in synonymy under *Muehlenbeckia leptobotrys* Meisner and stated that it was a manuscript name found in the herbarium at Berlin. I have not seen authentic material.

Coccoloba caurana Standley, Field Mus. Publ. Bot. 22: 73. 1940; L. Williams, Explor. Bot. Venez. 189. 1942.

Although the description of this species was published twice as new, the taxon belongs in the synonymy of *Coccoloba fallax* Lindau and is discussed in more detail under that name. The type, in the herbarium of the Chicago Natural History Museum, is *Williams 11366*, from Venezuela.

Coccoloba cerifera Schwacke, Pl. Nov. Mineir. 1: 7. 1898.

I have not seen the original publication to check the validity of this name and so, for the present, must interpret the species from the specimen indicated as the type in the Berlin herbarium. The plant is unlike any other species found in southern Brazil. It resembles *Coccoloba schomburgkii* in the shape and thickness of the leaves, but differs from it in having long pedicels from which the apparently staminate flowers have fallen. The Pires and Black collection cited below compares well with the type specimen.

Brazil. MINAS GERAIS: Serra do Cipó, *Schwacke 11780* (B-holotype), *Pires & Black 2816* (NY).

Coccoloba charitostachya Standley in A. C. Smith, Lloydia 2: 176. 1939.

The type of this species is *A. C. Smith 2356*, collected near the mouth of the Charwair Creek, in the basin of the Rupununi River, British Guiana. The holotype is in the herbarium of the Chicago Natural History Museum.

This species is not well defined in the original description and has not been recollected. Additional material is badly needed for an understanding of the species. At present the species may be characterized by the slightly rugose leaf blades which are elliptic-ovate in shape, rounded at the apex and lighter in color on the lower surface. The fruits are all insect-infested and abnormal and of no diagnostic value. Flowers are not known.

Coccoloba chacoensis Standley, Field Mus. Publ. Bot. 17: 239. 1937.

This species is to be referred to the synonymy of *Coccoloba spinescens*. *Coccoloba chacoensis* was based on *Cardenas 2529*, from Bolivia; the holotype is in the Chicago Natural History Museum. Buchinger and Sanchez (Bol. Soc. Argent. Bot. 7: 253. 1959) recognized this species and maintained it as distinct from *C. spinescens* Morong because of the absence of lateral branches terminating in spines and the presence of "glands" on the lower leaf surface. Although the Argentine botanists undoubtedly know these species in the field, the characteristics they have chosen to separate the species are not reliable in herbarium specimens. The holotype compares favorably with such collections as *Morong 882* (the type of *C. spinescens*) and *Hassler 11476* and *2486*.

Coccoloba confusa Howard, nom. nov.

Coccoloba declinata Martius, Beibl. Flora 20: 90. 1837; Meisner, Fl. Bras. 5(1): 29. 1855, as to plants, not as to name.

Coccoloba declinata var. *major* Meisner, Fl. Bras. 5(1): 30. 1855.

Coccoloba declinata var. *minor* Meisner, *ibid.*

Polygonum declinatum Vellozo (Flor. Flum. 162. 1825, Icon. 4: t. 41. 1827) was described briefly and in general terms. The illustration given

in the Icones is a poor one showing scarcely any characteristic of value in defining the taxa in *Coccoloba*. It was suggested by Dr. I. M. Johnston in his library notes that Pharmacopolis, the locality given, might be near the mouth of the Rio Taquari in the western part of the state of Rio near Paraty.

The transfer of the Vellozo name to *Coccoloba* made by Martius in an obscure paper is seldom correctly cited. Martius refers to two specimens, one from "Montem Talegraphi," in "Prov. Sebastianopolitana," and the other near Pendamonhangaba and Taubaté, in São Paulo. Martius' brief description of *Coccoloba declinata* is obviously based on the specimens cited and could scarcely be drawn from either the description or the plate given by Vellozo.

In 1855 when Meisner prepared the treatment of the genus for the *Flora Brasiliensis*, he described the species and established three new varieties: α *minor*, β *Velloziana* and γ *major*. For *Coccoloba declinata* var. *minor*, Meisner cited in reference "*Coccoloba declinata* Mart. Herb. propr." and a specimen from the Rio Doce collected April 1816 by Prince Maximilian. I have not seen this specimen in material from Brussels, Leningrad, Munich, or New York, the usual places for Martius and Meisner specimens. Meisner's variety, *Velloziana*, is based on the epithet and reference "*Polygonum declinatum* Vellozo Flor. Flum. IV. t. 41" and in place of a specimen Meisner cites "in prov. Rio de Janeiro."

Neither Meisner nor more recent authors cite the specimen from "Montem Talegraphi" which Martius mentioned in the original transfer of the Vellozo name. The specimen from Pendamonhangaba is referred by Meisner to his var. *major*.

Meisner prepared the treatment for *Coccoloba* in DeCandolle's *Prodramus*, using the same broad concept of varieties comprising the species *C. declinata*. In this treatment, however, the assignment of var. *major* to the species is questioned.

In his monograph of the genus Lindau reduced to synonymy Meisner's varieties *minor* and *Velloziana*. Lindau recognized the var. *major*, but commented on the poor condition of the type specimen and suggested that it might be a new species.

There appear to be no Vellozo collections available; thus the interpretation of the species must be made from the inadequate original description and the rather poor drawing. In comparing the drawing with the specimens cited by Martius, Meisner and Lindau, I am convinced that these authors have misinterpreted Vellozo's species. Vellozo's drawing shows that a scrambling plant is intended, but the material cited by previous authors for *Coccoloba declinata* is shrubby, with geniculate branches. Again, the drawing shows a short, regular inflorescence, while the young inflorescences of the specimens cited by earlier authors are geniculate, with the older inflorescences elongate. The most obvious match for the Vellozo species is the Martius specimen cited as the type of *C. racemulosa*. This is a liana with short lateral branches and comparable

inflorescences. The venation of the type of *C. racemulosa* compares favorably with that illustrated by Vellozo, while the venation of specimens cited by Martius, Meisner and Lindau does not. It appears to me that the drawing of *Polygonum declinatum* Vellozo most nearly compares to *Coccoloba racemulosa* Meisner.

The material which Martius, Meisner and Lindau cited and described as *Coccoloba declinata* therefore requires a new name. I propose the name *C. confusa*, to call attention to this problem. Lindau's description (Bot. Jahrb. 13: 166. 1890) applies to the specimens cited, including those originally mentioned by Martius in transferring Vellozo's specific epithet.

The inclusion of the Krukoff and the Archer collections from Amazonas and Pará creates a sizeable gap in the known range of this species. On the basis of available material, these specimens must be assigned here.

Brazil. AMAZONAS: Humaytá near Livramento, *Krukoff* 6669 (NY). PARÁ: Belém, *Archer* 7830 (F, K). RIO DE JANEIRO: Caju, *Riedel* s.n. (LE); Copacabana, *Luschnath* s.n. (LE); Rio de Janeiro, *Glaziou* 3089 (BR), *Riedel* 675 (A, BR, LE, M), 676 (A, BR, LE, M); Telegraphenberg, *Luschnath*, Oct. 1833 (BR). SÃO PAULO: Pedamhongaba, Taubaté, *Martius* "66" (BR, LE, M—type of *C. declinata* var. *major*).

Coccoloba conduplicata Maguire, Bull. Torrey Bot. Club 75: 304. 1948.

A clear-cut species, but known only from the material cited in the original description. The folded leaf blade noted in the specific name appears to be of less significance than the author indicates, since the majority of the leaves are not conduplicate.

Surinam. Tafelberg, *Maquire* 24437 (A, BR; NY—holotype), 27205 (A, NY).

Coccoloba cordata Chamisso, Linnaea 8: 133. 1833.

Coccoloba candolleana Meisner, Fl. Bras. 5(1): 41. 1855.

Coccoloba cordata var. *praecox* Hassler, Repert. Nov. Sp. 14: 162. 1915.

Both Meisner and Lindau have indicated the similarity of *Coccoloba cordata* Chamisso and *C. candolleana* Meisner. Lindau distinguished between these in his key by placing *C. candolleana* in a group of species having leaves glabrous on both surfaces and *C. cordata* in one having leaves pubescent along the midrib and nerves on the lower surface. Lindau has placed the two species adjacent to one another in the text. Among the major characters of these species, Lindau described *C. candolleana* as having tomentose ocreae while those of *C. cordata* are glabrous.

The type collection of *Coccoloba cordata* is *Sellow* s.n. from the Rio Pardo area of Brazil. I have seen three sheets of this collection. One in the herbarium at Berlin bears the full data given by Chamisso and is selected as the lectotype. The other two were annotated only "*C. cordata* N."

The descriptions given by Chamisso and Lindau are not entirely accu-

rate. Various branches of the specimens comprising the type collection have puberulent or tomentose ocreae, although other portions are glabrous. Most of the leaves are coarsely pubescent along the midrib at the base of the leaf, but some are completely glabrous.

Coccoloba candolleana was based on *Blanchet 1818*. A single specimen is cited as being at Geneva while a smaller specimen from the Meisner herbarium, now at the New York Botanical Garden, bears several of Meisner's annotations: (1) "*C. cordata* Cham. ?" which he declared to be different on the basis of the shorter petiole and more coriaceous blades; (2) a variety of *C. cordata* named for Blanchet, a name which was not published, and finally (3) "*Coccoloba candolleana* n." The Blanchet collection has broader leaves and shorter petioles, but can be compared favorably with portions of the Sellow collection which is the type of *C. cordata*.

In his monograph Lindau included a collection from Colombia (*Goudot 4*) in the description of *Coccoloba candolleana*. This collection is better referred to *C. padiformis*, a species known from Venezuela and Central America (Howard, *Jour. Arnold Arb.* 40: 210. 1959).

Coccoloba cordata var. *praecox* Hassler was based on a specimen, *Hassler 7279*, from Paraguay which is staminate, in contrast to the pistillate type of *C. cordata*. The deciduous characteristic of the plant is not significant, and the variety is not worthy of recognition.

Argentina. CHACO: Barranqueras, Isla de Temores, *Curran 402* (US). FORMOSA: Comán, *Jørgensen 2064* (GH, US); Pirané, *Morel 432* (BR). JUJUY: San Pedro, *Di Lella and Garcia 2820* (A). MISIONES: Apóstoles on Río Chimiray, *Ibarrola 1150* (V). SALTA: Embaracación, *Eyerdam & Beetle 22916, 22928* (GH); Orán, Tabacal, *Schreiter 5472, 8455* (GH); Orán, Vespució a las Hablillas, *Schreiter 11492* (F); Río Blanco, *Venturi 5585* (F, GH, LE, M); Río Piedras, *Rodríguez 73* (F). TUCUMÁN: Capital, Barranca Colorada, *Venturi 955* (F); Raco, *Schreiter 1516, 8443* (GH). **Brazil.** BAHIA: *Blanchet 1818* (G, NY-type collection of *C. candolleana*). RIO GRANDE DO SUL: Rio Pardo, *Sellow s.n.* (B-lectotype; M). SÃO PAULO: *Gaudichaud 140* (P). **Paraguay.** CHACO: Villa Rica, *Balansa 3277* (G). Concepción, *Hassler 7279* (GH-type of *C. cordata* var. *praecox*).

Coccoloba cordifolia Meisner, *Fl. Bras.* 5(1): 37. 1855.

Meisner cited several specimens but did not indicate a type. A sheet in the Delessert herbarium has been cited as the type by previous workers, although it bears two branches and two labels (*Blanchet 100* and *Blanchet 3528*). Meisner (DC. *Prodr.* 15: 155. 1856) suggested that *Coccoloba laevis* might be identical with *C. cordifolia*. Lindau (*Bot. Jahrb.* 13: 186. 1890) combined the two, accepting the older *C. laevis* Casaretto, a step which I believe to be correct.

Coccoloba coronata Jacquin, *Enum. Pl. Carib.* 19. 1760, *Select. Stirp. Am. Hist.* 114. t. 77. 1763; Dugand, *Caldasia* 4: 427. 1947; Howard, *Jour. Arnold Arb.* 41: 40. 1960, not Lindau, *Symb. Ant.* 1: 228. 1899.

Coccoloba virens Lindley, Bot. Reg. 21: t. 1816. 1835.

Coccoloba novogranatensis Lindau, Bot. Jahrb. 13: 192. 1890; Howard, Jour. Arnold Arb. 40: 85-87, 208, 209. 1959.

Coccoloba dioica Karsten ex Lindau, Bot. Jahrb. 13: 170. 1890.

Coccoloba caribaea Urban, Symb. Ant. 5: 337. 1907.

Coccoloba waittii Johnston, Sargentia 8: 122. 1949.

The correct name of this species has evolved through the series of my papers cited above with the final correction suggested by one of Dugand's papers which I had overlooked. It is possible that *Coccoloba jagifolia* Jacq. should be assigned to the synonymy of this species as well. The identity of that plant will be discussed under that epithet.

I have not seen any material collected by Jacquin, and the species is regarded as typified by an illustration. Specimens from St. Vincent, south to Trinidad and Tobago, and from Guatemala and Panama are cited in earlier papers (Jour. Arnold Arb. 40: 85, 209. 1959). I have also examined the following specimens from South America.

Colombia. BOYACÁ: Between Anapoima & Apulo, *Triana* 978 (B, P-type of *C. novogranatensis*); El Humbo, *Lawrance* 760 (A); Santa Marta, *H. H. Smith* 2421 (A, BR). BOLIVAR: Sabanilla, *Karsten s.n.* (B, LE). CAQUETÁ: Hetuchá on Río Orteguzaza, *Woronow & Juzepczuk* 6100 (F). MAGDALENA: Molino, *Haught* 4148 (F, NY). DEPT. NOT KNOWN: Pozo del Higuierón, *Usiacuri*, *Dugand* 788 (Y). **Ecuador.** El Oro, Arenillas, *Little* 6721 (F). **Peru.** LORETO: Río Putumayo, *Klug* 2240 (A, B, GH). **Venezuela.** ANZOATEGUI: Soledad, *Gines* 3913 (US). BOLIVAR: Between Upata & Altagracia, *Steyermark* 57681 (F). DISTRITO FEDERAL: Barrancas, *Tamayo* 1315 (US); Caracas, *Karsten s.n.* (LE-holotype of *C. dioica*). SUCRE: Cristóbal Colón, *Broadway* 143, 144, 491 (GH, NY, US). ZULIA: Perija, *Tejera* 91 (US). DEPT. NOT KNOWN: Sta. Ana, Paraguana, *Tamayo* 854 (US).

Coccoloba corrientina Rojas, Bull. Geogr. Bot. 28: 162. 1918.

The original description of this species is brief and generalized. No specimens are cited and, in fact, a broad general distribution is attributed to the species. Through personal correspondence I have learned from Dr. Maria Buchinger and other Argentine botanists that no Rojas collections can be attributed to this species. The species appears to be impossible to typify.

Buchinger and Sanchez (Bol. Soc. Argent. Bot. 7: 255. 1959) list *Coccoloba corrientina* as a questionable species, but suggest its similarity to *C. morongii*, the correct name of which is *C. paraguariensis*. I concur with this suggestion.

Coccoloba crescentiifolia Chamisso, Linnaea 8: 134-136. 1833, "*crescentiaefolia*."

The correct name of this species is *Coccoloba arborescens* (Vellozo) Howard based on *Polygonum arborescens* Vellozo. For a discussion of the nomenclature and additional synonymy see the previous paper in this

series (Jour. Arnold Arb. 41: 43–45. 1960). Specimens previously referred to this species are listed under *C. arborescens* above.

Coccoloba cruegeri Lindau, Bot. Jahrb. 13: 209. 1890.

Coccoloba ernstii Johnston, Proc. Am. Acad. 40: 685. 1905.

Coccoloba oblonga Lindau, Bot. Jahrb. 13: 136. 1890.

This species was based on a Crueger collection from Trinidad. Lindau described the fruits and assigned the species to the section *Campderia*. Currently available collections from Berlin and Göttingen are fragmentary and sterile. The specimen from the Trinidad herbarium appears to have had flowering parts at one time. There is some doubt as to what Lindau actually saw and described, for there is no evidence in the vegetative parts that the species is related to the others which he assigned to section *Campderia*.

Coccoloba oblonga Lindau was described at the same time as *C. cruegeri* and was based on *Riedel 614*, reported to be in "herb. Petrop." I have now seen that specimen and the others cited below, and there is no question that *C. oblonga* is the same as *C. cruegeri*. The Riedel collection from Ilheos, Bahia, represents a sizeable, but not unlikely, extension of range. As Lindau indicated, the material is for all practical purposes sterile, although the specimens do have immature and poorly preserved inflorescences and flowers.

The range of this species is now from the islands of Trinidad and Margarita to British Guiana and Bahia in Brazil. Collections from Trinidad and Margarita were cited in an earlier paper (Jour. Arnold Arb. 40: 75, 76. 1959).

British Guiana. Ituribisi Lake, Essequibo Coast, *Forest Dept. B.G. 5474* (A, K). **Brazil.** BAHIA: Ilheos, *Riedel 614* (B, LE, P-type of *C. oblonga*); without specific location, *Blanchet 3160A* (P). **Venezuela.** SUCRE: Cristóbal Colón, *Broadway 697* (GH).

Coccoloba cujabensis Weddell, Ann. Sci. Nat. III. 13: 259. 1850.

Coccoloba longiochreata Hassler, Repert. Spec. Nov. Reg. Veg. 14: 162. 1915.

One specimen of *Martius 1241* in the Munich herbarium has been designated as the lectotype of this species. *Coccoloba cujabensis* is suggestive of *C. ruiziana* Lindau, but field study or additional collections are necessary to determine their correct relationship.

Hassler compared his new species, *Coccoloba longiochreata*, with *C. alagoensis* Weddell and *C. floribunda* Lindau. He distinguished it on the basis of the larger ocreae. The type selected by Hassler is a vigorous staminate flowering specimen. The type of *C. cujabensis* is a fruiting collection. On the basis of vegetative characteristics they are similar, and any question is resolved by a study of the Werdermann and Kuntze collections cited below. These show the intermediate conditions of ocreae and leaf venation between the type specimens of *C. cujabensis* and *C.*

longiochreata. *Coccoloba cujabensis* is not at all comparable to *C. alagoensis* or "*C. floribunda*."

Bolivia. Beni, Trinidad, Misiones Guarayos, *Werdermann* 2366 (MO). **Brazil.** MATO GROSSO: Corumbá, *Kuntze* s.n. (NY); Cuyabá at Patricio da Silva Manso, *Martius* 1241 (B, BR, LE; M-lectotype). **Paraguay.** Chaco, *Fiebrig* 1284 (M-type collection of *C. longiochreata*).

Coccoloba cyclophylla Blake, Contr. U. S. Natl. Herb. 20: 238. 1919.

The type is *Curran* 47, from San Martín de Loba, Dept. Bolívar, Colombia (US 537207). Blake compared his new species with "*Coccoloba rotundifolia* Meisner," now known as *Coccoloba leoganensis* Jacq., from Hispaniola. There is no question that *C. cyclophylla* is the same as *C. caracasana* Meisner, which was based on material from Caracas, Venezuela.

Coccoloba cylindrostachya Lindau, Bot. Jahrb. 13: 163. 1890.

Lindau described consecutively *Coccoloba cylindrostachya* (based on *Glaziov* 13135) and *C. glaziovii* (based on *Glaziov* 8089) in his monograph of the genus. Both collections were made in the vicinity of Rio de Janeiro. An examination of the specimens fails to support the differences which Lindau felt would separate the two species. Therefore, *C. cylindrostachya* has been referred to the synonymy of *C. glaziovii*.

[To be continued]



Howard, Richard A. 1960. "Studies in the genus *Coccoloba*, IX. A critique of the South American species [prim.]." *Journal of the Arnold Arboretum* 41(2), 213–229. <https://doi.org/10.5962/bhl.part.15231>.

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