

BOTANY.—*Proposed classification of the genus Rollinia, with descriptions of several new species.* W. E. SAFFORD, Bureau of Plant Industry.

Among the finest fruits of tropical America are certain custard apples of the genus *Rollinia*. This genus, belonging to the Annonaceae, is characterized by fruits closely resembling the chirimoya (*Annona cherimola* Miller), the sugar-apple or *pomme-cannelle* (*A. squamosa* L.), and the bullock's heart (*A. reticulata* L.), but its flowers are very distinct in form from those of the genus *Annona*.

Much confusion exists in the botanical classification of the principal commercial species of this genus. This is owing chiefly

to the fact that, in original descriptions, either the fruit and not the flower was described, or vice versa, and that botanical names have been applied to fruits in the markets unaccompanied by leaves or flowers, which are necessary to determine the species. As a re-

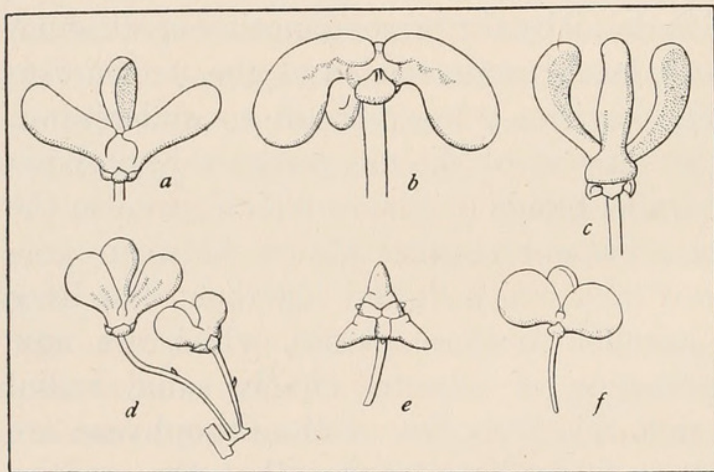


Fig. 1. Types of *Rollinia* flowers: a, *R. Sieberi*; b, *R. deliciosa*; c, *R. laurifolia*; d, *R. rugulosa*; e, *R. lanceolata*; f, *R. emarginata*.

sult, Martius, in his great work, *Flora Brasiliensis*, applies the name *Annona obtusiflora* to a *Rollinia* sold in the markets of Brazil under the name *fructa do Conde*, which he imagined to have been introduced into Brazil from the Antilles; and a second species of *Rollinia*, mentioned by Marcgrave under the name *biribá*, he places in the genus *Duguetia* under the name *D. Marcgraviana*. The only large-fruited Brazilian *Rollinia* which he mentions under its true generic name he refers to Alphonse De Candolle's *R. orthopetala*, a species of British Guiana, the fruit of which was not seen by De Candolle.

An examination of herbarium material and of fruits of several species introduced into Florida by the Office of Foreign Seed and Plant Introduction, United States Department of Agriculture, shows that certain longstanding errors should be corrected and that the genus needs revision.

It may be well to point out, in connection with the plants above mentioned, that *Annona obtusiflora* was described by De Tussac in 1808 from a cultivated plant growing in an orchard near the western extremity of Haiti, and was regarded by Baillon as a synonym of *Rollinia mucosa*, a species based on Jacquin's *Annona mucosa* growing wild and in cultivation on the island of Martinique. The *biribá*, which Corrêa, in his recent *Flora do Brazil*, identifies with Martius's *Duguetia Marcgraviana*, must be a *Rollinia*; it cannot possibly belong to the genus *Duguetia*, since its fruit does not, as in *Duguetia*, consist of separate carpels borne on the indurated receptacle, but is an edible syncarpium with fleshy pulp from which a fermented drink is sometimes made.¹ The only Brazilian species of *Rollinia* introduced into Florida under the name *Rollinia orthopetala* which has yielded a large edible fruit cannot possibly be the true *R. orthopetala* A. DC., since its flowers are not like the flowers of that species, but have their outer corolla lobes broadly spreading and curving downward, instead of "erect and incurved," as described by De Candolle. Corrêa, in the work cited, refers the *biribá* of Pernambuco and Matto Grosso to *Duguetia Marcgraviana* Mart. and the *biribá* of Pará to *Rollinia orthopetala* A. DC.

FLOWERS OF ROLLINIA

The flowers of *Rollinia* differ from those of *Annona* in having a gamopetalous corolla composed of three large outer lobes and three minute inner lobes alternating with them. The large lobes, corresponding to the outer petals of *Annona*, are produced into wings or spurs, the form of which differs so widely that they offer a convenient basis for classification. In the accompanying illustration (fig. 1) the principal types of *Rollinia* flowers are

¹ "Os fructos são comestíveis e submettidos á fermentação, dão bebida vinosa."
—M. PIO CORRÊA. *Flora do Brazil*, p. 22. 1909.

shown. The outer corolla lobes may be: (a) compressed, widely spreading, and more or less ascending or upcurved, as in *Rollinia mucosa* (Jacq.) Baill.; (b) decurved and obtuse or rounded at the extremity, as in *Rollinia deliciosa* and *R. Pittieri*, to be described below; (c) erect or ascending and incurved, as in *Rollinia orthopetala* A. DC. and *R. laurifolia* Schlecht.; (d) obovate and ascending, as in *Rollinia rugulosa* Schlecht.; (e) short, thick, and spur-like, as in *Rollinia lanceolata* R. E. Fries; or (f) suborbicular or broadly obovate and widely spreading, as in *Rollinia emarginata* Schlecht.

FRUITS OF ROLLINIA

In the genus *Rollinia* the fruit is a fleshy syncarpium, composed of a number of one-seeded carpels which become fused into a solid spheroid or ovoid head. In some cases the surface of the fruit is distinctly areolate, as in *R. mucosa*, the areoles being marked by pentagonal or hexagonal outlines and bearing mamillate projections. These may point outward, or be recurved toward the stem, or curved toward the apex of the fruit; or the areoles may be gibbous or rounded and very distinct, like those of the sugar-apple, *Annona squamosa*; or they may terminate in a blunt point. In a few species, as in *Rollinia glaucescens*, the surface of the fruit is nearly smooth, like that of the common *A. reticulata*.

The species in which the mature carpels are quite distinct and fall off separately from the indurated receptacle, or torus, have been set apart by the writer under the generic name *Rolliniopsis*.²

BOTANICAL CLASSIFICATION

The groups suggested above, based upon the form of the flowers, cannot be regarded as subgenera or even as sections, for the line of demarcation is not always sharply drawn. In some species, for example, the corolla lobes may be ascending or nearly erect at first, and at length more widely divergent; while in

² *Rolliniopsis*, a new genus of Annonaceae from Brazil. Journ. Wash. Acad. Sci., 6: 197. 1916.

others they may be nearly horizontal when immature and at length more or less decurved. Moreover, the members of a group are not always botanically close to one another. Nevertheless the arrangement of the various species into groups according to the shape of the corolla is a great aid to classification and will prevent many errors. A striking example of erroneous identification is that of the flower figured by Baillon and reproduced in Engler and Prantl's *Natürlichen Pflanzenfamilien* under the name *Rollinia mucosa*. This is certainly not the flower of Jacquin's *Annona mucosa*, the *cachiman morveux* of Martinique, which is the type of the species. The slender, ascending, incurved lobes place it at once in the same group with *Rollinia orthopetala* A. DC. and *R. laurifolia* Schlecht. On the other hand, the widely spreading lobes of *Annona obtusiflora*, as figured by De Tussac, place that species in the same group with *Rollinia Pittieri* and *R. deliciosa*, described below. In some cases two or more species with similar leaves and fruits but with very distinct flowers have been wrongly associated under a single name, as in the case of *R. sylvatica*, as usually treated by botanists.

In a systematic study of any group of plants the desirability of going back to the original description of each species will at once be recognized. In certain monographs more easily accessible to the student than the various publications in which the species were first described, amended descriptions are often given, based not on the species itself but upon some allied species mistaken for it. In many cases the monographer has never had the opportunity of examining the type material. Martius, for instance, in describing *Annona obtusiflora* and *Duguetia Marcgraviana* could not possibly have seen the plants on which these species were based; and nothing in De Candolle's description of *Rollinia orthopetala* indicates that the fruit of the plant he described was "of the size of a child's head." The plants growing in the inundated forests along the banks of the Amazon, in the province of Pará, which yielded the fruits described by Martius, may have been specifically distinct from the type of De Candolle's species, which grew near Demerara, in British Guiana, of whose fruit we know nothing but of whose flower we know certainly

that the corolla lobes were erect and incurved. To prevent possible mistakes of this kind the exact locality in which a new species was collected should always be indicated. If this is done incomplete type material may possibly be supplemented by future collections from the same plant or at least from a similar plant growing very near it.

The present writer has not sufficient material to attempt to monograph the genus *Rollinia*. In the following notes he has been much aided by herbarium specimens from the Botanical Museum of Copenhagen sent him for study through the kindness of Dr. C. H. Ostenfeld.

GROUP A

COROLLA LOBES OBLONG, WIDELY SPREADING AND SLIGHTLY ASCENDING OR UPCURVED

Rollinia dolabripetala (Raddi) St. Hilaire, Fl. Bras. Merid., **1**: 29. 1825.

Annona dolabripetala Raddi, Mem. Soc. Ital. delle Sci. Modena, **18**: 394. 1820.

Rollinia longifolia St. Hil., loc. cit.

In this species, the type of the genus *Rollinia*, the corolla lobes are laterally compressed and shaped like a hatchet or broad-bladed knife (dolabriform), at first ascending, at length broadly spreading.

TYPE LOCALITY: Mount Corcovado, near Rio de Janeiro, Brazil.

Flowering specimens in the United States National Herbarium were collected in the type locality by Messrs. Rose and Russell (No. 20311).

Rollinia mucosa (Jacq.) Baillon, Adansonia, **8**: 268. 1868.

Annona mucosa Jacq. Obs. 16. 1764 (excl. syn. Rumph.).

The flowers of this species are described as having oblong corolla lobes spreading outward in such a way as "not inaptly to represent a tricorner hat." The areoles of the fruit are gibbous or convex, not papillose or aculeate. The viscous pulp is edible but of poor flavor.

TYPE LOCALITY: Martinique. Growing spontaneously in the forests and very rarely cultivated; known locally as *cachiman morveux*.

This species is described as resembling in habit *Annona reticulata* L. Specimens in the U. S. National Herbarium, collected by Père Duss in Martinique, have coarser leaves and larger flowers than *Rollinia Sieberi*, and the gibbous areoles of the fruit are bounded by raised polygonal outlines.

Rollinia Sieberi A. DC. Mém. Soc. Phys. Genève, **5**: 200, pl. 2, fig. B. 1832.

This species resembles *R. mucosa*, from which it differs in its smaller flowers, more slender pedicels, and thinner and more delicately veined leaves. De Candolle, who regarded it as specifically distinct from *R. mucosa* (which he mentions), figures the flower as solitary, with laterally compressed corolla lobes, rounded at the extremities and curving slightly upward.

TYPE LOCALITY: Island of Trinidad, British West Indies, where it was collected by Sieber (No. 96) and distributed under the name *Annona reticulata*.

The fruit, according to Père Duss, is usually larger than that of *Annona squamosa*, which it resembles in its raised, squamose areoles and its pleasantly flavored, sweet, fleshy pulp. A specimen in the U. S. National Herbarium collected in Porto Rico by Sintenis (No. 4170) is referred to this species. Urban³ refers this plant to *R. mucosa* but adds that the Porto Rico specimens have smaller flowers than specimens of *R. mucosa* from other localities. To the writer *R. Sieberi* appears to be a valid species. It is certainly quite distinct from *Annona obtusiflora* De Tussac, of which Baillon believed it a synonym, and also from the Mexican plants referred by Baillon to *R. mucosa*, collected by Liebmann at Mecapuleo (No. 27) and Mirador (No. 28), the original specimens of which, with leaves velvety pubescent beneath, are before me. Specimens with flowers and fruit from Trinidad, the type locality of the species, are desired.

GROUP B

COROLLA LOBES OBLONG OR SPATULATE, HORIZONTAL OR CURVED
DOWNWARD

Rollinia deliciosa Safford, sp. nov.

FIGURE 2.

Rollinia orthopetala Corrêa, Flora do Brazil, p. 22. 1909, not De Candolle.

A medium-sized tree. Blades of the vegetative leaves obovate-oblong or elliptical, rounded or acute at the base, normally acuminate at the apex, 20 to 28 cm. long, 7.5 to 11 cm. broad, membranaceous, when young sparsely canescent-hirtellous above, densely so beneath, especially along the midrib and nerves, at length glabrous above and beneath except along the midrib and primary nerves (18 to 22 on each side), these reddish brown, slender but prominent beneath; petiole about 10 mm. long; blades of the leaves of the flowering branches smaller, the lowermost ones relatively shorter and broader, sometimes broadly

³ Symb. Antill., **4**: 242.

ovate or orbicular, 3.5 to 6 cm. long, 3.5 to 5 cm. broad. Peduncles leaf-opposed, often in pairs, sometimes solitary, rarely in 3's, 25 to 40 mm. long, bearing a small ovate sessile bracteole near the middle, strigillose with reddish hairs, like the petioles and nerves of the lowermost leaves (prophylla) beneath. Flowers canescent-puberulous; corolla lobes compressed laterally, widely diverging and decurved, rounded at the extremity. Stamens numerous, closely crowded, the expanded connectives forming a pavement above the pollen sacs. Carpels numerous; ovaries hairy; styles expanded, glandular-puberulous. Fruit a solid subglobose syncarpium, 8 to 12 cm. in diameter, the areoles distinctly outlined and terminating in an obtuse beak; peduncle straight and woody, about 5 cm. long; flesh white or cream-colored, juicy, fine-flavored; seeds compressed, 15 to 20 mm. long, 8 to 10 mm. broad, rounded at the apex, gradually narrowing to the base; hilum not prominent; testa thin, brown, wrinkled by the inclosed ruminant endosperm.

Type material in the U. S. National Herbarium, accompanied by photographs of the flowers and fruit, from a tree growing in the Experimental Garden, Miami, Florida, propagated from seed from Pará, Brazil, sent by Mr. C. F. Baker in April, 1908 (No. 22512). Flowering specimen, sheet No. 865973, collected at Miami, Florida, March 11, 1913; fruiting specimen, sheet No. 865976, from the same tree, August 30, 1912; both collected by Edward Simmonds, in charge of the Miami garden.

This plant was introduced into the United States under the name *Rollinia orthopetala*, but it is readily distinguished from that species by the decurved wings of the corolla. Both flowers and fruit were received by the writer from Mr. Simmonds, through the kindness of Mr. P. H. Dorsett, Plant Introducer, Bureau of Plant Industry, in charge of Introduction Field Stations. Mr. C. F. Baker describes its fruit, known in Brazil as the "*biribá* of Pará," as the finest annonaaceous fruit of Tropical America. The accompanying illustration (fig. 2) is from a drawing of type material by Mrs. R. E. Gamble.

***Rollinia Pittieri* Safford, sp. nov.**

A forest tree with leaves glaucous beneath and abruptly acuminate. Blades of the vegetative leaves elliptical or obovate, 16 to 20 cm. long, 7 to 8.5 cm. broad, the midrib and primary nerves (16 to 20 on each side) reddish brown beneath; leaves of flowering branches smaller, with 10 to 12 pairs of lateral nerves. Pedicels in clusters of 3 or 4, straight or curved, graduated in length, the longer ones 35 to 50 mm. long, minutely rufous-puberulent, bracteolate near the middle. Flowers minutely puberulent, as though composed of felt; calyx and spheroid base of the corolla rufous; calyx lobes triangular, acute or acuminate, appressed to the corolla, the tips reflexed; corolla wings 15 to 20 mm. long, 6 to 10 mm. broad near the extremity, laterally compressed,

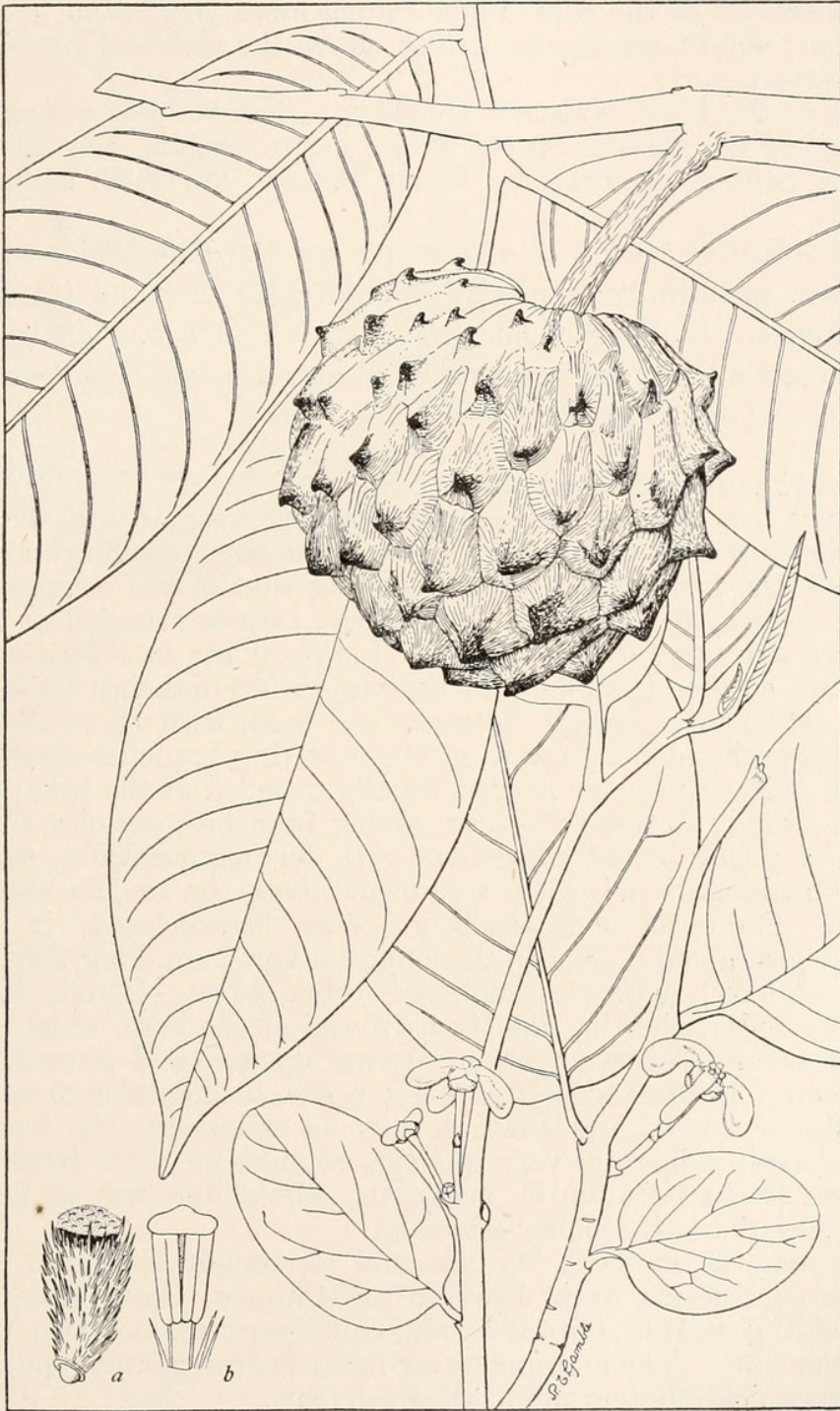


Fig. 2. *Rollinia deliciosa* Safford. From the type material. Branches with leaves, flowers, and fruit, one-half natural size; *a*, carpel, and *b*, stamen, much enlarged.

falcate, horizontally spreading and curved downward, rounded at the apex, narrowed at the base; inner corolla lobes very small, triangular, connivent, almost closing the orifice above the essential parts. Fruit not observed.

Type in the U. S. National Herbarium, No. 679511, collected near sea level, on the plain of Sperdi, near Puerto Obaldía, San Blas Coast, Panama, September, 1911, by Henry Pittier (No. 4358, in flower.)

This beautiful species is remarkable for the pale under surface of its leaves, beautifully veined with reddish brown, and its clustered inflorescence. It differs from *R. rufinervis* Triana & Planch. in having the corolla lobes curving downward instead of divergent-ascending. Specimens of the fruit are desired.

Rollinia Jimenezii Safford, sp. nov.

FIGURE 3.

A small tree of Costa Rica, resembling *R. mucosa*, but the flowers in clusters of 2 or 3, the corolla wings horizontally spreading and slightly decurved, the fruit when fresh resembling that of the common sugar-apple (*Annona squamosa*), its component carpels rounded at the tips but when dry more or less beaked. Leaves ovate to oblong-elliptical, acuminate at the apex, those of the vegetative branches 18 to 30 cm. long, 6.5 to 14 cm. broad, obtuse at the base, with 18 to 22 primary nerves on each side, the leaves of the flowering branches smaller, with 12 to 16 pairs of primary nerves, usually rounded at the base; point of acumen usually obtuse or retuse; young branches, petioles, and lower surface of young leaves pubescent with ferruginous hairs, the leaves at length glabrous or nearly so except along the midrib and nerves beneath. Peduncles extra-axillary, often leaf-opposed, in clusters of 2 or 3, graduated in length, the longest about 2 cm. long, ferruginous-tomentose like the ovate-acuminate calyx lobes. Corolla lobes oblong, rounded at the tip, slightly narrowed at the base, widely spreading and usually decurved, never curving upward and inward, rufous-puberulent. Fruit subglobose, about 6 cm. in diameter, 6 to 10 cm. long, closely resembling that of *Annona squamosa*, the component carpels loosely adhering, very gibbous, rounded or often retuse at the tip when fresh; pulp white, acidulous, edible, but not so agreeably flavored as that of *Annona squamosa*.

Type material in the U. S. National Herbarium, collected by Otón Jiménez at Nuestro Amo, Province of Alajuela, Costa Rica; flowers collected March, 1912, (No. 427), and fruit from the same tree, October, 1912 (No. 543). The accompanying figure is drawn from type material and from a field photograph of the fresh fruit.

The author takes great pleasure in naming this species in honor of Mr. Otón Jiménez, of San José, Costa Rica, an accomplished young botanist to whom he is indebted for herbarium specimens of the plant,



Fig. 3. *Rollinia Jimenezii* Safford. From the type material. Natural size.

field photographs of the fruit, and descriptive notes. In a letter dated September 12, 1912, Mr. Jiménez describes the plant as follows:

"At Nuestro Amo it is known as *anonillo*. The fruits are squamose and are sometimes 10 cm. by 6 cm. when mature. The skin is then yellow; but while still immature it is of a greenish and somewhat glaucous color. It is edible, with an acidulous pulp and a great quantity of seeds which have a tendency to adhere to the skin when the latter is removed. This fruit is little appreciated by the natives, but when it is kept for some time among the leaves and allowed to become fully ripe, it is rather appetizing. The trees reach a height of 8 meters. On young [vegetative] branches the leaves are often quite large, and of a beautiful green color. I hope to obtain for you fruits fully ripe, but I shall have to send them to you in fragments as I have no facility for sending them entire."

In another communication Mr. Jiménez states that all the *Rollinia* material from Nuestro Amo was obtained from the same tree, and that the specimens of fruits photographed in the field, so remarkably like those of *Annona squamosa*, were the same as the dried fruit forwarded to the writer, with the individual carpels much more distinctly separated and terminating in many cases in a sharp point.

GROUP C

COROLLA LOBES LINEAR-OBLONG OR SPATULATE, ASCENDING OR ERECT AND INCURVED

Rollinia orthopetala A. DC. Mém. Soc. Phys. Genève, 5: 200. 1832.

A shrub or small tree resembling *R. Sieberi*. Branches and leaves very much as in that species; petioles slightly longer; leaf blades oval-oblong, acute at each end, pilose. Peduncles in pairs; calyx lobes smaller than in *R. Sieberi*; corolla wings erect and incurved.

Type in Herb. De Candolle, collected near Demerara, British Guiana, in 1824, by Charles S. Parker.

Martius, in his *Flora Brasiliensis*, gives an amended description of this species, the fruit of which he describes as "the size of an infant's head," with sweet, white, fleshy pulp. It is not certain, however, that the trees producing the fruits described by him really belong to this species. It is probably owing to Martius's description that the name *R. orthopetala* has been incorrectly applied to several species of *Rollinia* with large edible fruit. Of these the principal species, from an economic point of view, is *R. deliciosa*, described above, which is readily distinguished from *R. orthopetala* by its widely spreading, decurved corolla wings.

Specimens of *R. orthopetala*, with photographs of its fruits, from Demerara, its type locality, are much desired.

Rollinia laurifolia Schlecht. *Linnaea*, 9: 319. 1835.

A shrub or small tree. Leaf blade oblong-elliptical or oblong-lanceolate, acuminate at the apex, obtuse at the base, the upper surface glabrous to the naked eye, the lower surface clay-colored. Corolla lobes ascending-erect, broadened and rounded or obtuse at the apex and incurved; peduncles solitary or in 2's or 3's, graduated in length, the longest about 3 times the length of the petioles. Fruit subglobose, about the size of a horse-chestnut, composed of many distinctly outlined carpels, and containing an edible white mucilaginous pulp, with a pleasant sweet taste.

Type material collected by Sellow in Brazil (Nos. 809, 1190). Known locally as *araticú mirim*.

This species bears a certain resemblance to *R. dolabripetala*, but differs from it in having the flowers in clusters of 2 to several, while the corolla wings are narrow, ascending, and incurved (instead of broad and widely diverging), and the lateral nerves and midrib are usually (but not always) hairy on the upper surface. A closely allied plant collected by Riedel (October, 1823) in the forest near Mandioca has been described by R. E. Fries under the name *R. laurifolia* var. *longipes*. A specimen with geminate fruits recently collected and photographed at Sitio, Minas Geraes, Brazil, by Messrs. Dorsett, Shamel, and Popenoe (No. 37882) apparently belongs to this variety.

Rollinia incurva Moore, *Trans. Linn. Soc. II. Bot.*, 4: 303. 1894.

A diffuse shrub with short-petioled leaves resembling those of *R. laurifolia*, but obtuse at the apex and rounded at the base, glabrous and glossy above and paler beneath. Corolla wings spatulate-oblong, ascending and incurved, clothed with ferruginous tomentum.

Type in the British Museum, collected by the Matto Grosso Expedition in Santa Cruz, Brazil; duplicates of the type in the Herbarium of Columbia University, New York Botanical Garden.

GROUP D

WINGS COMPRESSED, OBOVATE AND ASCENDING

Rollinia rugulosa Schlecht. *Linnaea*, 9: 316. 1834.

A shrub or small tree. Leaf blades lanceolate or broadly lanceolate, obtusely short-acuminate at the apex, acute at the base, on both sides subglabrous, beneath glossy; young branchlets, petioles, and midrib appressed-puberulous. Peduncles usually recurved or pendulous and thickened at the apex, warty and puberulous like the calyx, 8 to 10 mm. long. Corolla lobes obovate, ascending, rounded or obtuse at

the apex, narrowed at the base, tomentose-canescens, 8 mm. long, 4 mm. broad. Fruit globose, 2.5 to 3 cm. in diameter, the component carpels forming 20 to 30 slightly raised, rounded areoles. Seeds small, pale brown, conoid, somewhat flattened.

Type in the Berlin Herbarium, collected in southern Brazil by Sellow.

Closely related to *R. rugulosa* and with very similar fruit but longer and narrower leaves (suggesting those of *R. salicifolia* Schlecht.) is *R. Warmingii* R. E. Fries, the type of which was collected on Mount Tijuca, near Rio de Janeiro, by Glaziov (No. 6079).

GROUP E

COROLLA LOBES SHORT, STRAIGHT AND SPURLIKE, HORIZONTALLY DIRECTED

Rollinia lanceolata Fries, Svensk. Vet. Akad. Handl., **34**⁵: 49, pl. 6, fig. 6. 1900.

A small tree with small leaves, the blades lanceolate, acute at the apex and base, above glabrous except along the midrib, beneath densely ferruginous-villous along the midrib. Young branches, petioles, and solitary or rarely geminate peduncles ferruginous-tomentose. Flowers ferruginous-hirsute; outer corolla lobes spur-like, short, rounded, and widely spreading. Fruit not observed.

Type in Botanical Museum of Copenhagen, collected in Brazil by Glaziov (No. 13509).

GROUP F

COROLLA LOBES BROADLY OVATE OR SUBORBICULAR AND Laterally COMPRESSED

Rollinia emarginata Schlecht. Linnaea, **9**: 318. 1835.

A glabrescent shrub 2 to 3 meters high, growing in marshy places, with slender branches. Leaf blades, thin, membranaceous, oval or elliptical, obtuse at both ends or acutish at the base, emarginate or retuse at the apex, on both sides subglabrous and opaque. Peduncles usually solitary, slender, about 25 mm. long, minutely bracteolate at the base. Corolla and calyx silky-hirtellous; corolla wings obovate-orbicular, widely spreading, laterally compressed. Fruit solid, about 25 to 30 mm. in diameter, ovoid globose, the component carpels scarcely at all raised or distinctly outlined.

Type in the Berlin Herbarium, collected in the province of Rio Grande do Sul, Brazil, by Sellow.

This species is very common in southern Brazil and Paraguay. It is distinguished from most of its congeners by its small smooth fruit and emarginate leaves.

Rollinia glaucescens Sond. *Linnaea*, **22**: 557. 1849.

A glabrescent shrub. Leaf blades thinly membranaceous, ovate or lanceolate, obtuse or rarely acute at the apex, acute at the base, 5 to 7 cm. long, 2.5 cm. broad, glaucescent beneath; petioles 6 to 10 mm. long. Peduncles in pairs, one shorter than the other, the longer one bearing a small bracteole below the middle. Flowers canescent-puberulous; corolla wings broadly obovate or suborbicular, widely spreading. Fruit broadly ovoid or subglobose, small (about 2.5 cm. in diameter), solid, and smooth, the component carpels scarcely outlined and not at all gibbous.

Type collected in the Province of Minas Geraes, Brazil, by Regnell on his second expedition.

This species is closely allied to *R. emarginata* Schlecht., a species well known to Sonder. From this it differs in its leaves, which are never emarginate, and in its smaller flowers. Specimens in the U. S. National Herbarium were collected and photographed at São João de Rey, Minas Geraes, in January, 1914, by Messrs. Dorsett, Shamel, and Popenoe (No. 286). Plants have been propagated from the seed of these specimens by the Office of Foreign Seed and Plant Introduction (No. 37880).

Rollinia sylvatica (St. Hil.) Mart. *Fl. Bras.* **13**¹: 18. 1841.

Annona sylvatica St. Hil. *Pl. Usuelles*, pl. 29; *Fl. Bras. Merid.*, **1**: 32. 1825.

A medium-sized tree. Leaves large, elliptical, somewhat resembling those of *Annona cherimola*, but usually acutish at the base and obtuse or very shortly cuspidate, rarely oblong-elliptical and acute or acuminate, above usually puberulous, beneath softly pubescent. Peduncles extra-axillary. Fruit usually solitary, edible.

Type collected by St. Hilaire in the forests of Minas Geraes, Brazil. Fruit, locally known as *araticú do mato* (custard apple of the forest), ripening in March.

At least two species are usually found in herbaria labelled *R. sylvatica*: one with elliptical leaves, very much like those of the chimoya, and suborbicular corolla wings; the other with lanceolate leaves shaped very much like those of *R. laurifolia*, and with spatulate corolla wings. In both, the leaves are pubescent beneath. The first corresponds more nearly to the type described by St. Hilaire, in which flowers were lacking. Specimens in the National Herbarium recently collected and photographed in the field by Messrs. Dorsett, Shamel, and Popenoe at Bom Fim (No. 436) and Lavras (No. 250) are referred to this species. Probably distinct from this is a tree growing to a height of 20 to 25 feet, rarely cultivated in gardens at São João del Rey, in

which the leaves are lanceolate, acute at the apex, and rounded at the base, very much as in *R. incurva* Moore. A photograph of a fruit-bearing branch (No. 1571) was secured. The fruit, about 4.5 cm. in diameter, is composed of comparatively few large, pointed carpels. It is yellow when mature and edible, but rather insipid. As no flowers were secured, it is not possible to place this plant in one of the groups here proposed.

ZOOLOGY.—*Ophiomaria*, a new genus of ophiurans from southern South America and the adjacent portion of the Antarctic continent.¹ AUSTIN H. CLARK, National Museum.

Two new species of ophiurans from the coast of Chile which were dredged by the *Albatross* on her journey from the Atlantic to the North Pacific represent a type which appears to be intermediate between *Ophioperla* and such species of *Ophiosteira* as *O. senoqui* Koehler and *O. koehleri* A. H. Clark, possessing the general structure of the latter combined with the granular disk covering of the former. Together with two other species, described in 1901 by Professor Rene Koehler these forms appear to represent a logical generic unit which may be known as

***Ophiomaria*, gen. nov.**

Genotype.—*Ophiomaria tenella*, sp. nov.

Diagnosis.—The disk is pentagonal or more or less stellate. The dorsal surface is beset with fine granules which to a greater or lesser degree conceal the plates. In the central portion of the interbrachial spaces below there are usually numerous granules which surround, or even entirely conceal, the plates.

The arms are slender and evenly tapering, in length equal to about four times the diameter of the disk, circular in section proximally, becoming slightly flattened distally, rarely carinate.

The arm comb is represented by a narrow band of irregular plates or beadlike granules beyond the radial shields which recall the supplementary arm plates in *Ophiopholis*.

At the base of the arm the upper arm plates are usually very wide, narrowly oblong; they rapidly become narrowly fan-shaped, and in the distal half of the arm very small and widely separated from each other.

There are from three to five minute spaced arm spines.

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Safford, William Edwin. 1916. "Proposed classification of the genus *Rollinia*, with descriptions of several new species." *Journal of the Washington Academy of Sciences* 6, 370–384.

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