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TWO NEW GUATEMALAN TOURNEFORTIAS

DOROTHY N. GIBSON

A NEW MEMBER OF *MORGANELLA*

PATRICIO PONCE DE LEON

A NEW *ODONTOGLOSSUM* FROM NICARAGUA

ALFONSO H. HELLER

STUDIES IN THE PALM GENUS *SYAGRUS* MART. II

S. F. GLASSMAN

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VOLUME 32, NUMBERS 5, 6, 7, 8

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AUGUST 11, 1969

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Studies in the Palm Genus *Syagrus* Mart. II

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UNIVERSITY OF ILLINOIS, CHICAGO CIRCLE

As the revisional study of *Syagrus* progresses, new information accumulates. This work is a continuation of another article bearing the same title (Glassman, *Fieldiana: Botany* 31 : 363-397. 1968). Examination of recent collections, especially, from the Bailey Hortorium and the U. S. National Herbarium plus my own collections from Brazil has revealed some interesting results. This research has been supported by N.S.F. grant no. GB-6899.

One of the most perplexing problems in studying the genus *Syagrus* has been the clear distinction between *S. flexuosa* (Mart.) Becc. and *S. campestris* (Mart.) Wendl. Both species were originally described by Martius in 1826 under the genus *Cocos*. Examination of the lectotypes of each taxon from Munich (figs. 1 and 2), both collected by Martius, reveals certain basic differences. In *S. flexuosa* the middle pinnae are up to 7 mm. wide with slightly oblique tips and the female flowers are 19-20 mm. long; whereas the middle pinnae are up to 13 mm. wide with strongly oblique tips, and the female flowers are only 15-17 mm. long in *S. campestris*. Study of other collections of these two taxa seemed to indicate that there were probably two entities based on size of female flowers, but differences in the width and the tips of the middle pinnae were not as evident. I attempted to use other key characters, such as size of spathes and size of spadix branches, but these, too, were unsatisfactory. It was not until recently, when I compared the habit (both frequently growing in clumps) and the geographic distribution of the two taxa (both have been reported from the states of São Paulo, Minas Gerais, Goyaz, Bahia, and Matto Grosso in Brazil), that I realized they may be conspecific. Further study revealed that the width and apices of the middle pinnae are very variable in some populations. In *Glassman & Gomes 8044 to 8051* (CHI) inclusive, collected in Lagoa Santa, Minas Gerais, the maximum width of the pinnae ranges from 5-10 mm. and the tips are largely oblique in younger leaves, whereas

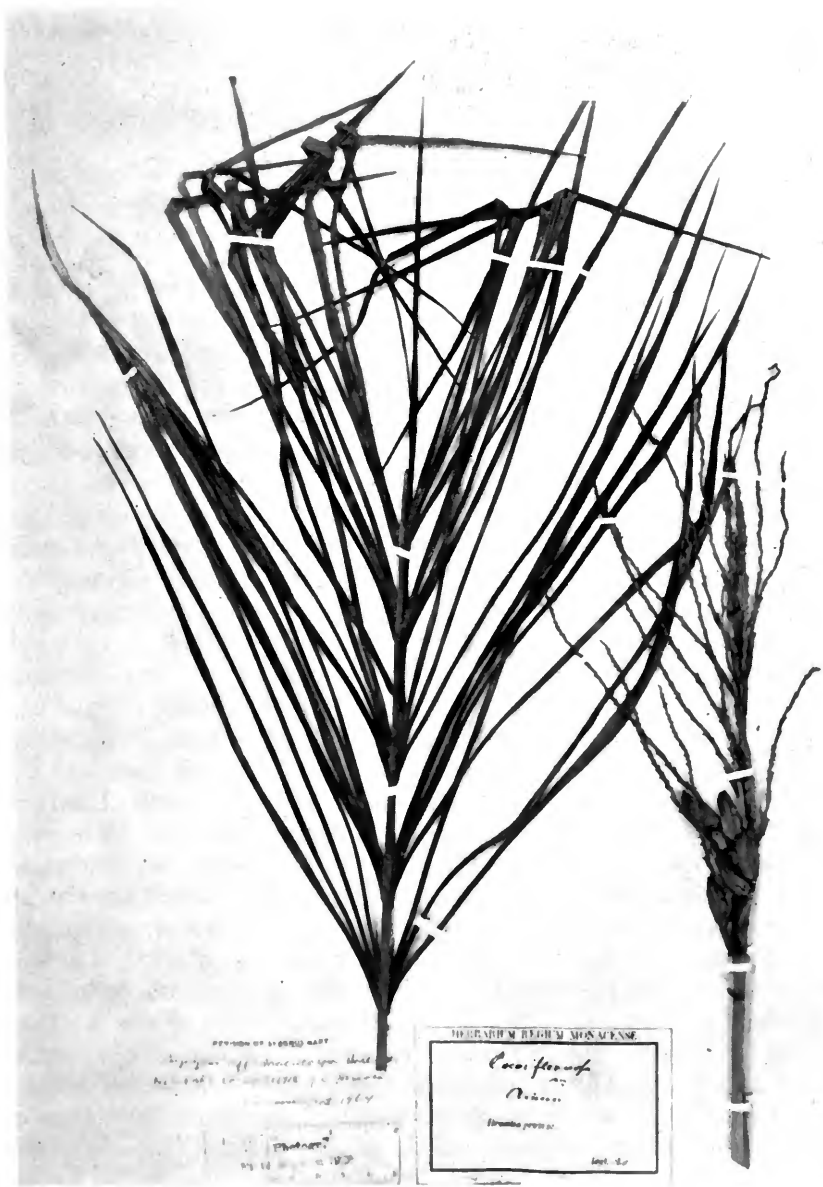


FIG. 1. *S. flexuosa*. Lectotype of *Cocos flexuosa*. Martius s.n. (M).



FIG. 2. *S. flexuosa*. Lectotype of *Cocos campestris*. Martius s.n. (M).



FIG. 3. *S. flexuosa*. Isotype of *Cocos urbaniana*. Glaziou 15558 (C).

the older leaves have pinnae with symmetrical or oblique tips on the same leaf. In other collections, however, the mature leaves may have pinnae with either all symmetrical or all oblique tips on the same plant. In another example collected from the state of Goyaz, *Glaziou 22261* (C, F, FI, G, K, MO, P, US), the pinnae vary from 5 mm. to 15 mm. wide in different specimens.

Length of female flowers is also quite variable. Examples are *Glaziou 22261*, in which the flowers are 12-13, 17-18, 15-20, and 17-20 mm. long on different spadix branches; and *Glaziou 20026* (C,K), from Minas Gerais, the flowers being 15-17 and 17-20 mm. long.

Cocos urbaniana Dammer, (*Glaziou 15558*—P, holotype; C,F,FI, K,MO) undoubtedly belongs here, too (fig. 3). Type specimens resemble the lectotypes of both *C. campestris* and *C. flexuosa*. The pinnae are 8-11 mm. wide with strongly oblique tips and the female flowers are 13-17, 15-17, and 19-22 mm. long on different spadix branches.

In view of the fact that *C. campestris* and *C. flexuosa* were both described by Martius in the same publication in the same year, the problem is which name to use. *C. flexuosa* was described on p. 120 and *C. campestris* on p. 121, therefore I am selecting *C. flexuosa* as the earlier name.

Syagrus flexuosa (Mart.) Becc., L'Agric. Colon. 10: 466. 1916. *Cocos flexuosa* Mart., Hist. Nat. Palm. 2: 120, t. 64, 86. 1826. *C. flexuosa* var. *cataphracta* Mart., l.c. 120. 1826. *C. flexuosa* var. *densiflora* Mart., l.c. 120. 1826. *C. campestris* Mart., l.c. 121, t. 87. 1826. *S. campestris* (Mart.) Wendl., Index Palm. 17, 1854. *C. urbaniana* Dammer, Engl. Bot. Jahrb. 31: 22. 1902. *S. urbaniana* (Dammer) Becc., L'Agric. Colon. 10: 468. 1916.

The following is an emended description of *S. flexuosa*, based on more than 50 numbers examined by me.

Palm 2.0-4.5 m. tall, trunks frequently in clumps. Naked petiole up to 37 cm. long, sheathing base up to 31 cm. long, edges deteriorating into separate fibers; rachis of leaf up to 106 cm. long, up to 79 pairs of pinnae, mostly in clusters of 3-4 (2-5), glaucous or eglaucous on both surfaces, middle ones up to 36 cm. or more long, 5-16 mm. wide, with oblique or acuminate tips; expanded part of spathe up to 48 cm. long and 6 cm. wide, branched part of spadix up to 44 cm. long, branches up to 18 or more in number, each branch up to 36 cm. long; male flowers 5-10 mm. long on upper part, 10-16 mm. long on lower part; female flowers 12-22 mm. long, 6-9 mm. wide; mature?

fruit 3.0–4.3 cm. long and 1.5–1.7 cm. in diameter, with beak up to 6 mm. long, endocarp cavity mostly regular in outline, endocarp 3–3.5 mm. thick; complete seed not seen.

Another group of related species which present a problem in identification are *Syagrus sancona* Karsten and *S. tessmannii* Burret. *S. sancona* was originally described from Colombia in 1857, Karsten s.n.—LE, lectotype (fig. 4), and in 1866 Karsten also published an excellent illustration of this palm. Dahlgren (in Field Mus. Nat. Hist. Bot. 14: 268. 1936) apparently assumed that *Oreodoxa sancona* H.B.K. and *Syagrus sancona* Karsten, both described from Colombia, were the same thing and made the following citation: *Syagrus sancona* (H.B.K.) Karsten. This is incorrect for *S. sancona* was described by Karsten as a new entity without any reference to the older H.B.K. name. Consequently, Karsten's name precludes the transfer of *Oreodoxa sancona* H.B.K. to the genus *Syagrus*. There is no way of determining what *Oreodoxa sancona* is because the brief description is not characteristic of *Syagrus* and, furthermore, no illustrations were published nor could any type specimens be found. Therefore, I am designating *Oreodoxa sancona* H.B.K. as *species incerta*. In addition to this, Dahlgren listed *Oenocarpus sancona* (H.B.K.) Sprengel as a synonym of *Syagrus sancona* Karsten. This, too, is incorrect because it is based on *Oreodoxa sancona* H.B.K. In 1943, Dugand (Caldasia 2: 289.) followed Dahlgren's use of *Oreodoxa sancona* H.B.K. as a basionym of *S. sancona* Karsten. He also listed *Oenocarpus iriartoides* Triana as a synonym, saying that the description and type locality of *Oreodoxa sancona* H.B.K. is practically identical to this species. Here again, the description of *O. iriartoides* is inadequate to place it in *Syagrus*; and since no illustrations were published or could any type specimens be found, I am omitting this name from the synonymy of *S. sancona* Karsten.

S. tessmannii Burret, on the other hand, was described from Peru in 1933. Holotype material, *Tessmann 4811* (fig. 5), consisting of spathes, spadices, flowers, petiole, part of a leaf and a piece of wood, is located in the Berlin herbarium. Since one palm originated from Colombia and the other from Peru, I assumed all along that they were distinct taxa. But, after examining a number of specimens labelled *S. sancona* and *S. tessmannii*, I noticed a striking similarity in the texture of the female flowers which are strongly nerved or rugose in both species. Apparently, the only other species of *Syagrus* with strongly nerved female flowers is *S. ecuadorensis* Becc. (fig. 6), known exclusively from Ecuador and closely related to the two palms

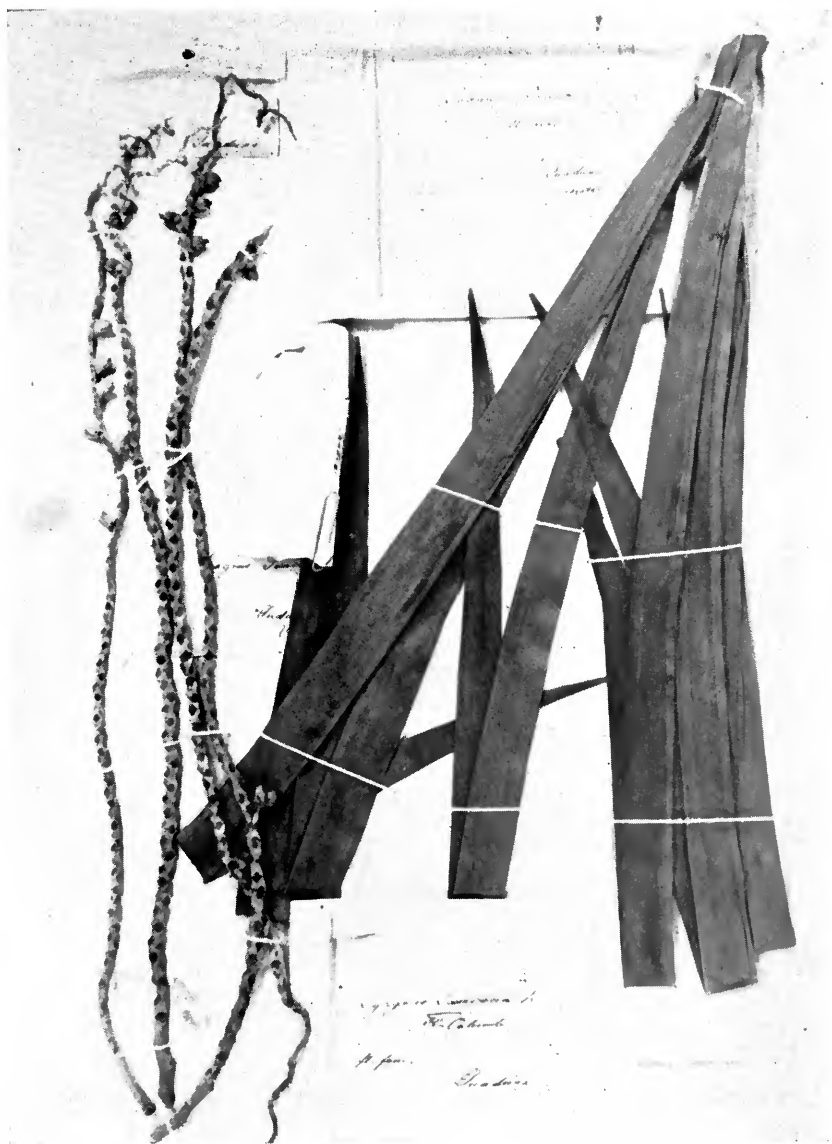


FIG. 4. *S. sancona*. Lectotype. Karsten s.n. (LE).



FIG. 5A. *S. sancona*. Holotype of *S. tessmanni*. Tessmann 4811 (B). Spathes and spadices.



FIG. 5B. *S. sancona*. Holotype of *S. tessmanni*. *Tessmann 4811* (B). Part of leaf.



FIG. 5C. *S. sancona*. Holotype of *S. tessmanni*. Tessmann 4811 (B). Petiole with sheathing base.

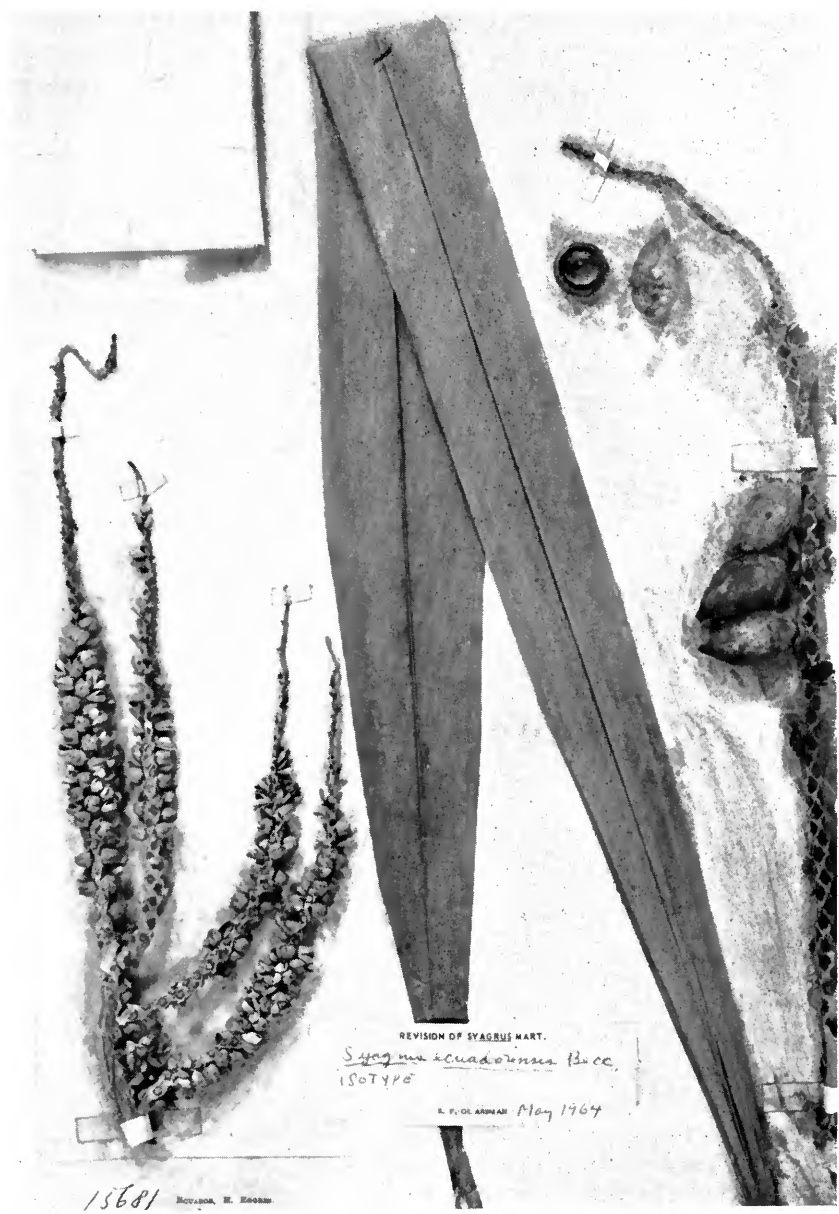


FIG. 6. *S. ecuadorensis*. Isotype. Eggers 15681 (K).

above, but these flowers are only 5–6 mm. long. Further study of the collections revealed that size (7–9 mm. long) and shape (obtuse tips) of the female flowers, and size (3.0–3.3 cm. \times 1.5–2 cm.) and shape (ovoid and slightly beaked) of the fruit, and width of the middle pinnae (3.8–4.5 cm.) are very similar. The most variability, however, seems to be in the shape and size of the male flowers. Flower size may vary from 8–9, 9–10, 10–11 or 9–12 mm. in length and are either lanceolate, ovate, or obovate in shape. Sometimes, all three shapes are found in male flowers of the same collection. An isotype (G) of *S. tessmannii* and a specimen collected from Colombia (*Philippson, Idrobo & Fernández 1656*–BM) contain separate detached spadix branches with male flowers only. Although Burret mentioned two kinds of spadices in his description, I was still doubtful about this characteristic because in the genus *Syagrus* male flowers are normally found in conjunction with female flowers, mostly on the lower half, and on the upper half of the same spadix branch the male flowers occur by themselves. A collection from Venezuela, *Steyermark & Rabe 96519*–BH (fig. 7), dispelled all doubt in my mind because it contains two kinds of partially complete spadices, a larger one with branches bearing both mature female and male flowers, 9–10 mm. long and 3–3.5 mm. wide; and a smaller one (immature?) with branches having mostly male flowers, 8–9 mm. long and 2–2.5 mm. wide, and a few undeveloped female flowers.

Corrected synonymy for this taxon is as follows:

Syagrus sancona Karsten, *Linnaea* 28: 247. 1857; *Fl. Colomb.* 2: 147, *t. 177*. 1866. *Cocos sancona* (Karsten) Hooker, *Report Kew* 1882: 72. 1884. *Syagrus tessmannii* Burret, *Fedde Rep.* 32: 106. 1933.

The following description is based on specimens examined and combines the characteristics of both *S. sancona* and *S. tessmannii*.

Palm up to 20 m. tall, trunk up to 35 cm. in diam. at base. Naked petiole up to about 56 cm. long, sheathing base up to 79 cm. long; rachis of leaf up to 255 cm. long (310 cm., fide Burret), up to 163 pairs of pinnae, mostly in clusters of 2–4, middle ones 56–100 cm. long, 3.5–4.5 cm. wide, mostly with acuminate tips; expanded part of spathe up to 100 cm. long and 21 cm. wide; branched part of flowering spadix (with both male and female flowers) up to 76 cm. long, branches up to 138 in number, each up to 58 cm. long; male flowers 7.5–11 mm. long on upper part, 9–12 mm. long on lower part; female flowers mostly strongly nerved with blunt tips, 7–9 mm.

long and 6–7 mm. wide; staminate spadix (immature? and with branches partly cut off) about 30 cm. long, branches about 25 or more in number, each branch (detached) up to 45 cm. long; male flowers 8–12 mm. long; branched part of fruiting spadix up to 109 cm. long, branches up to about 100 in number, each up to 63 cm. long; fruit 3.0–3.3 cm. long and 1.5–2 cm. in diameter, with short beak, endocarp cavity mostly regular in outline, trivittate, endocarp 1.5–2 mm. thick; seed 1.5–1.7 cm. long and 0.8–1.0 cm. in diameter, cavity very narrow.

Specimens examined.—COLOMBIA: Cundinamarca, Guaduas (Bogotá), *Karsten s.n.* (LE, lectotype); Dept Valle, between Piedra de Moler and Alto del Dinde, Nov. 17, 1946, *Cuatrecasas 22971* (F, MO); Rio Guapaya, Sierra de la Macarena, dense humid forest, Nov. 30, 1949. *Philipson, Idrobo & Fernandez 1656* (BM). PERU: Middle Marañon, near Apaga, Dec. 21, 1924, *Tessmann 4811* (B, holotype—photo; G); Dept. Loreto, Prov. Coronel Portillo, Buenos Aires, in pasture, May 6, 1960, *Moore, Salazar & Smith 8403* (BH); Yarinacocha, May 7, 1960, *Moore, Salazar & Smith 8408* (BH); Dept. San Martín, 8 km. of road from Tarapoto to Shapaja, dry woods, May 27, 1960, *Moore Salazar & Smith 8537* (BH). BRITISH GUIANA: probably introduced, Aug. 1899, *Jenman 7596* (K). TRINIDAD: Port of Spain, Victoria Square, cultivated? Jan. 2, 1931, *Broadway 7909* (BM, K, S). VENEZUELA: Estado Bolívar, Cerro Pichacho, Jan. 31, 1961, *Steyermark 88913* (BH, VEN); Estado Barinas, Socopo, rain forest along Highway 5, Aug. 25–26, 1966, *Steyermark & Rabe 96519* (BH); near Barrancas, secondary forest, April 25, 1967, *Wessels Boer 1762* (CHI).

Another pair of poorly defined species is *Syagrus orinocensis* (Spruce) Burret, described from Colombia and *S. stenopetala* Burret, from Venezuela. The type of *S. orinocensis*, *Spruce 49—K* (fig. 8), consists of three separate leaf parts and some naked spadix branches; whereas type material of *S. stenopetala*, *Jahn 1208—VEN*, holotype; US, BH (fig. 9), is composed of separate leaf parts, spathes, and spadices with male and female flowers, and fruiting spathes and spadices with a few detached fruits. Even though both species were adequately described, neither one was accompanied by an illustration. The types resemble each other in the pinnae being arranged in loose clusters of 2–3 and 2.0–2.4 cm. wide. Fruits of the type of *S. stenopetala* are unusual in that they are rather long (3.4–3.7 cm.) and relatively narrow (1.3–1.5 cm. in diameter) with a beak about 8 mm. long; and the female flowers are only 5 mm. long and 4 mm.



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Julian A. Steyermark y Martin Rabe

FIG. 7. *S. sancona*. Portion of staminate spadix. *Steyermark & Rabe 96519* (BH).

wide. I am quite certain that both the fruits and female flowers of the type of *S. stenopetala* are immature or incompletely developed because in another collection from Venezuela, *Pittier 9154*—VEN, US, G (fig. 10), determined by Burret as this species, the fruits are up to 3.4 cm. long and 2.2 cm. in diameter with a short beak, and the female flowers are 7–9 mm. long and 6–7 mm. wide. Another specimen, collected along the Rio Orinoco in Venezuela, e.g., *Wurdach & Monachino 40852* (BH), has mature fruits and female flowers approximately the same size and shape as above, and, in addition, young fruits (about 1.5 cm. long) with a beak about 5 mm. long, similar in shape to the fruits of *Jahn 1208*. Other specimens collected along the Rio Orinoco (*L. Williams 13138, 16019*—F; *Wessels Boer 1873*—CHI) also have short beaked fruits which are about 3 cm. long and 2 cm. in diameter. Until evidence to the contrary can be found, I am reducing *S. stenopetala* to synonymy under *S. orinocensis*. The most closely related species to *S. orinocensis* seems to be *S. allenii* Glassman, recently described from Colombia in *Fieldiana: Bot.* 31: 285. 1968, but the latter taxon has wider pinnae (up to 3.4 cm., rather than 2.0–3.0 cm.) smaller female flowers (6–7 mm., rather than 7–9 mm.) and smaller, more rounded fruits (2.5 cm. long and 2.2 cm. in diameter, rather than 3.0–3.4 cm. long and 2.0–2.2 cm. in diameter).

Syagrus orinocensis (Spruce) Burret, *Notizbl* 13: 695. 1937. *Cocos orinocensis* Spruce, *Journ. Linn. Soc.* 11: 161. 1869. *S. stenopetala* Burret, *Notizbl.* 11: 322. 1932.

Palm up to 12 m. tall (18 m.—fide Spruce) and 15 cm. in diameter. Naked petiole up to 74 cm. long, sheathing base up to 41 cm. long; rachis of leaf up to 150 cm. long, up to 107 pairs of pinnae, mostly in loose clusters of 2–3 or single, middle ones up to 56 cm. long, 2.0–3.0 cm. wide, with acuminate or oblique tips; expanded part of spathe up to 62 cm. long and 9 cm. wide; branched part of spadix up to 42 cm. long, branches 40 in number, each up to 30 cm. long; lower male flowers 10–12 mm. long and those above 7–10 mm. long; female flowers 7–9 mm. long, 6–7 mm. wide (immature—5 mm. long and 4 mm. wide); fruit up to 3.4 cm. long and 2.2 cm. in diam., with short beak up to 3 mm. long (immature—3.4–3.7 cm. long and 1.3–1.5 cm. in diameter, beak up to 8 mm. long), endocarp cavity mostly regular in outline, trivittate, endocarp 1–2 mm. thick along side, 2.5–4 mm. thick at ends; seed 1.6–1.9 cm. long, 1.2–1.4 mm. in diameter, cavity ovate.



FIG. 8A. *S. orinocensis*. Lectotype of *Cocos orinocensis*. Spruce 49 (K). Naked spadix and portion of leaf.

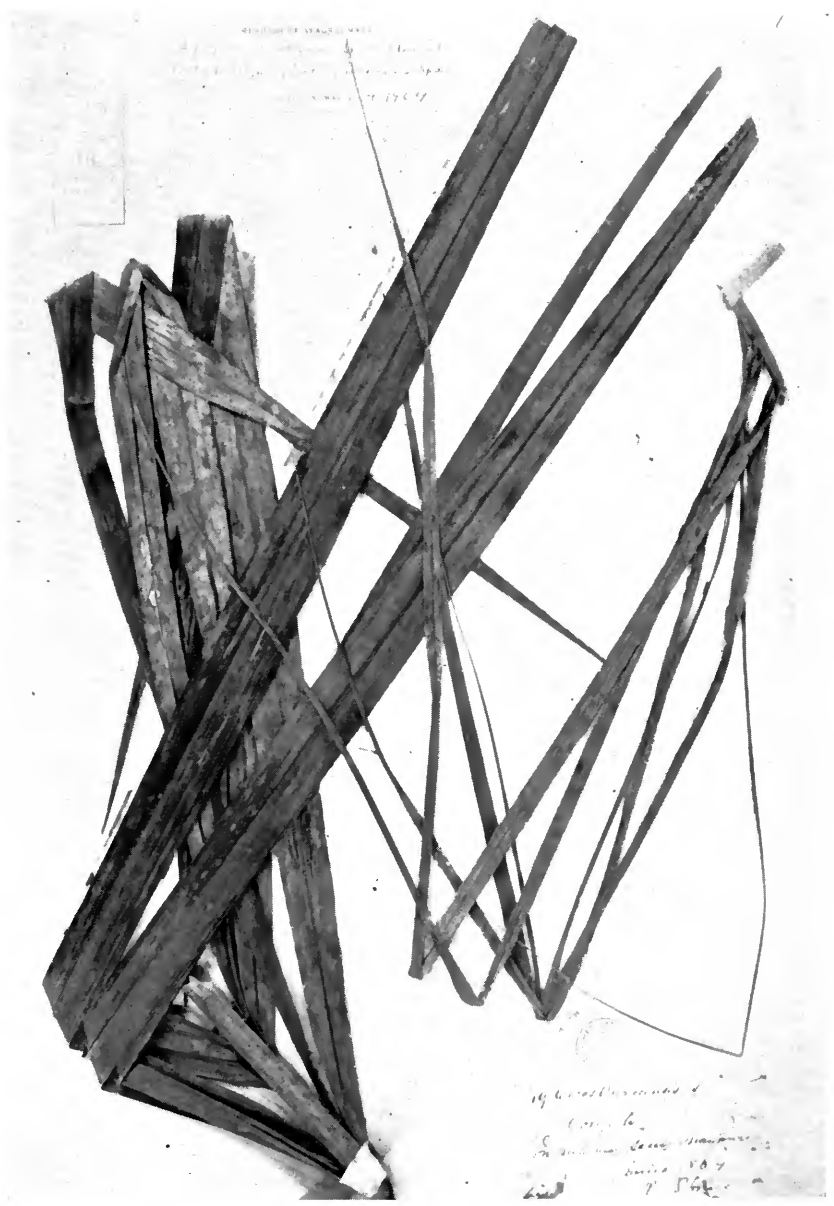


FIG. 8B. *S. orinocensis*. Lectotype of *Cocos orinocensis*. Spruce 49 (K). Portion of leaf.

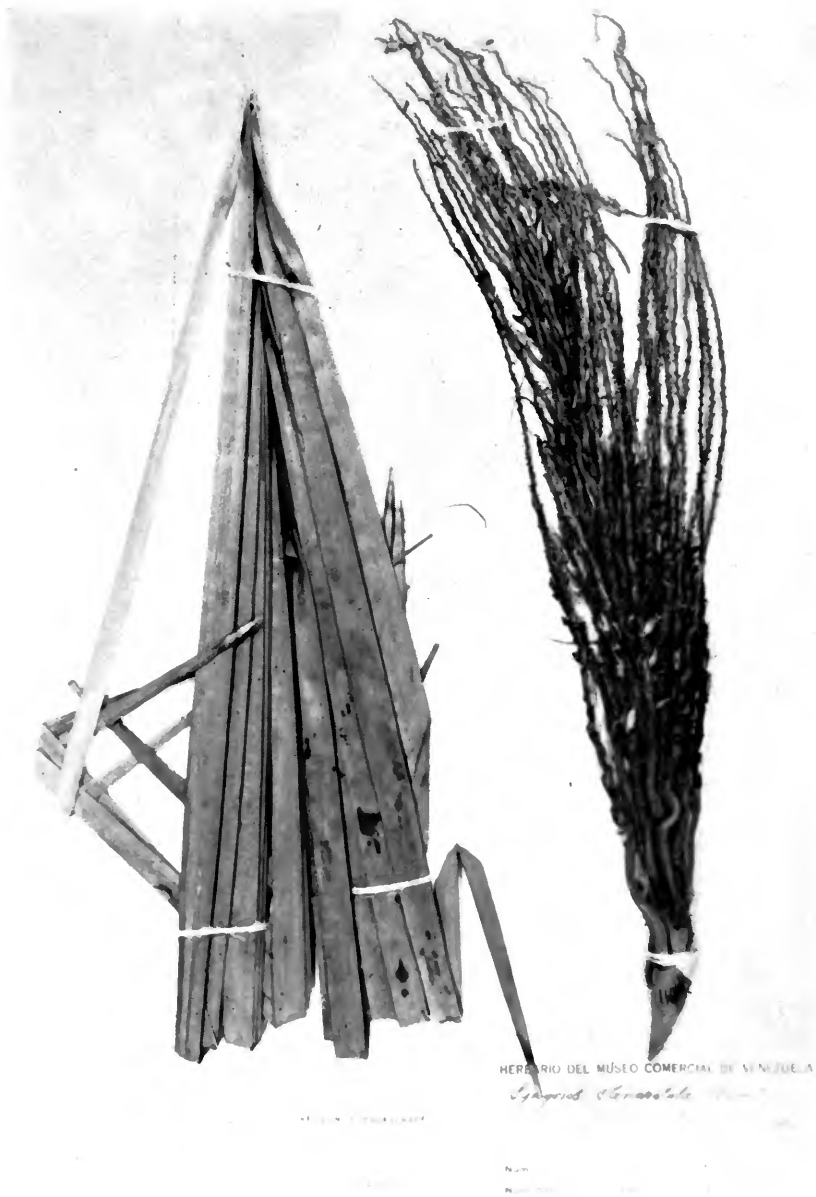




FIG. 9B. *S. orinocensis*. Holotype of *S. stenopetala*. Jahn 1208 (VEN).
Spathe and part of fruiting spadix.



FIG. 9C. *S. orinocensis*. Holotype of *S. stenopetala*. *Jahn 1208* (VEN).
Enlargement of single fruit.



FIG. 10A. *A. orinocensis*. Pittier 9154 (G, VEN). Part of flowering spadix with female and male flowers.



FIG. 10B. *S. orinocensis*. Pittier 9154 (G, VEN). Part of leaf.



FIG. 10C. *S. orinocensis*. Pittier 9154 (G, VEN). Longitudinal and cross-sections of fruit, and external view of upper half of fruit.

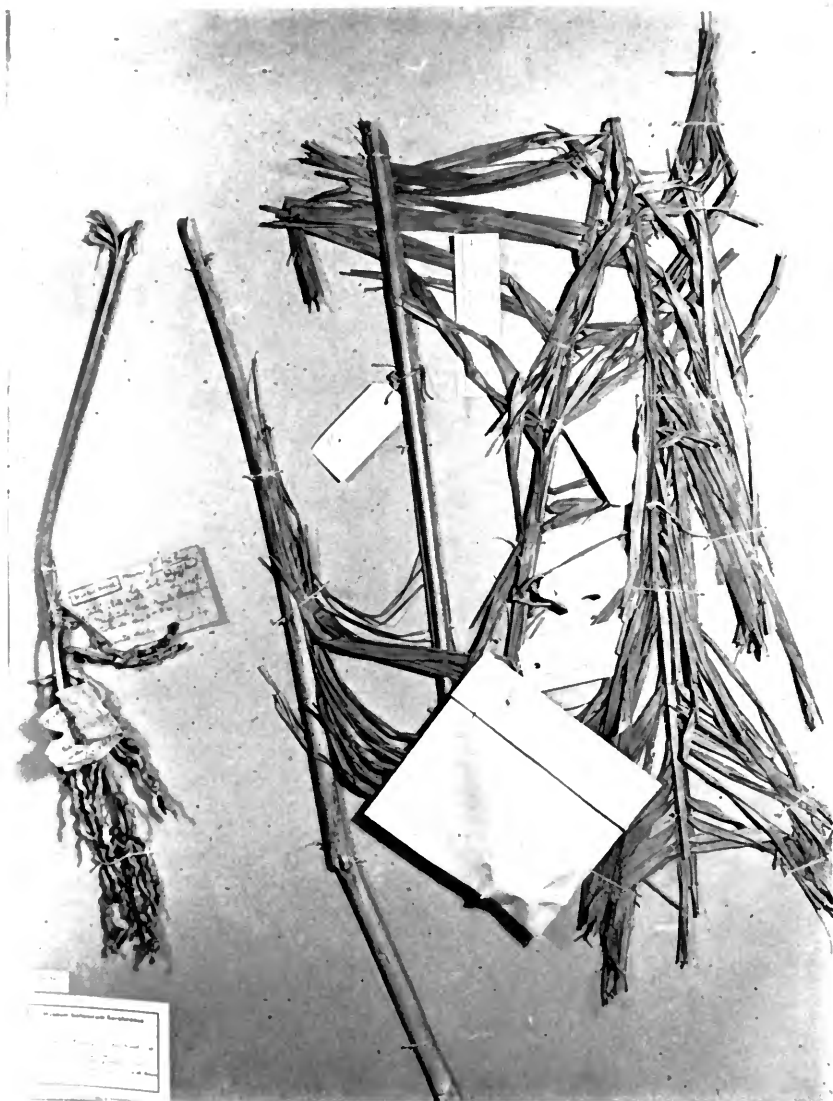


FIG. 11. *S. cocoides*. Holotype of *S. brachyrhyncha*. Hübner 112 (B).

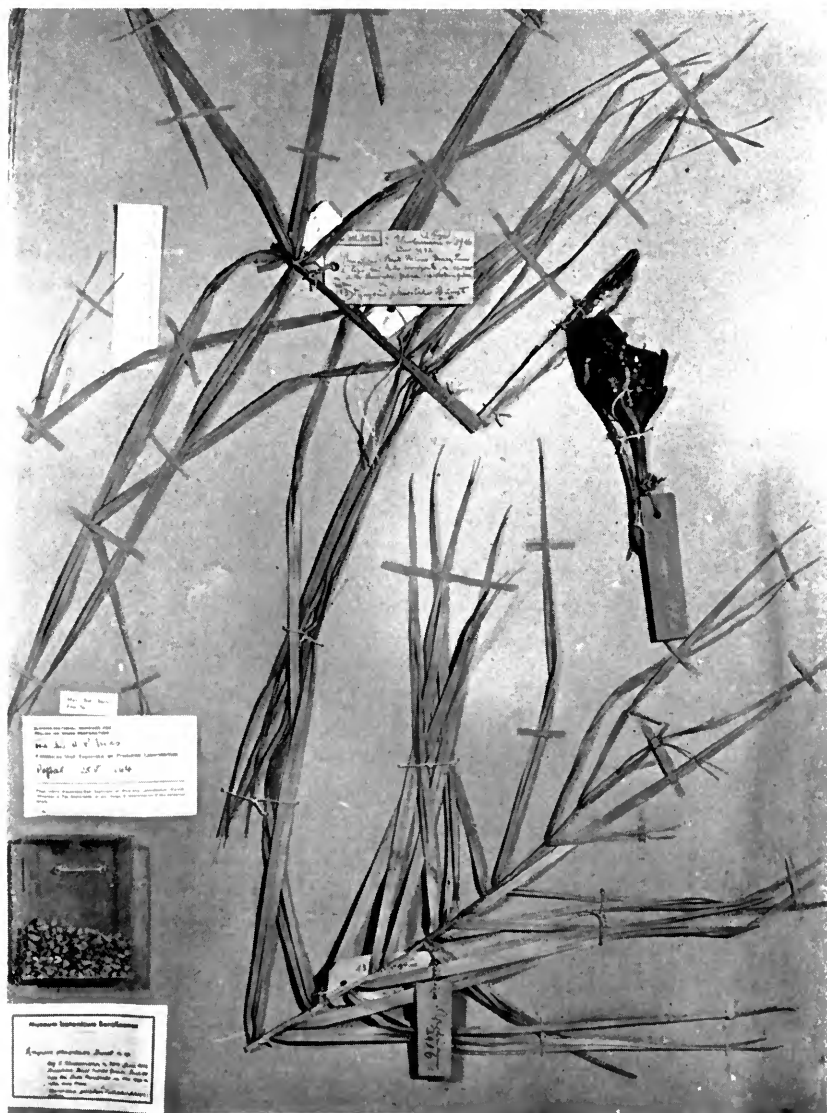


FIG. 12. *S. pleioclada*. Holotype. Werdermann 3916 (B).

Specimens examined.—COLOMBIA: In rupibus secus Mayopures, June 1854, *Spruce 49* (K, lectotype of *Cocos orinocensis*); Meta, jct. of Guejar and Zanza Rivers, Aug. 19, 1950, *S. G. Smith & J. M. Idrobo 1460* (US). VENEZUELA: Dist. Federal, Puerto La Cruz, 500 M., April 26, 1923, *A. Jahn 1208* (VEN, holotype of *S. stenopetala* (BH, US)); Puerto Cabello, Oct. 28, 1916, *J. N. Rose 22007* (GH); Carabobo, selvas de Guaremales, Dec. 10, 1920, *Pittier 9154* (G, US, VEN); near El Cambur, March 7, 1968, *J. G. Wessels Boer 2449* (CHI); Est. Bolivar, Piedra Marimare, east bank of Rio Orinoco, Dec. 19, 1955, *Wurdack & Monachino 40852* (BH); Amazonas, Sanariapo, 1942, *L. Williams 16019* (F); Amazonas, Puerto Ayachcho, May 27, 1940, *L. Williams 13138* (F, VEN); same locality data, July 25, 1967, *J. G. Wessels Boer 1873* (CHI); Yaracuy, near Nirgua, Nov. 11, 1967, *J. G. Wessels Boer 2045* (CHI).

Originally, it was reported that most of the palm material at the Botanisches Museum in Berlin—Dahlem was destroyed during World War II. Later it was learned that a number of specimens were salvaged from the ruins and subsequently, I wrote Dr. Eva Potzal inquiring about specimens of *Syagrus*. I was delighted to learn that a sizeable number from this genus were saved and recently I received photographs of these palms. The following list is divided into three parts: 1. holotypes, 2. isotypes, and 3. other specimens.

1. HOLOTYPES

Syagrus brachyrhyncha Burret (fig. 11). Brazil: Pará, Rio Maycurú, Kreis Monte Algre, *Hübner 112*. Specimen resembles **S. cocoides** Mart. very closely. **S. pleioclada** Burret. (fig. 12). Brazil: Minas Gerais, Serra do Cipó, June 1932, *Werdermann 3916*. This is a very distinct species. Several collections have since been made by others including myself. *S. tessmannii* Burret. = **S. sancona** Karsten. Previously discussed in this article.

Holotypes of *Syagrus*, originally deposited in Berlin and which are still missing include *S. microphylla* Burret (*Werdermann 3366*) and *S. werdermannii* Burret (*Werdermann 3472*). The determination of these two species is doubtful since no other specimens have been seen.

2. ISOTYPES

S. ecuadorensis Becc. (*Eggers 15681*). Specimens of this taxon also have been seen from the following herbaria: M, holotype; K,P,US.

S. hoehnei Burret. (*A. Gehrt 25.318*—SP, holotype). A number of other collections have been made of this distinctive species.

3. OTHER SPECIMENS

The remaining specimens of *Syagrus* (about 69 numbers) are not important to the revisional study of the genus. Most of them were collected in botanical gardens and many of these are incomplete specimens, consisting only of fruits or portions of leaves.

Publications 1071, 1072, 1073, and 1074



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