

NEW SPECIES OF SYAGRUS FROM THE STATE OF BAHIA (BRAZIL),
WITH A REVISIONAL STUDY OF CLOSELY RELATED TAXA*

S. F. Glassman

Professor of Biological Sciences, University of Illinois,
Chicago Circle and Research Associate in Palms, Field Museum
of Natural History.

Recent collections in 1974 and 1977 from Bahia by Ray Harley and Simon Mayo of Kew Gardens have revealed the discovery of an interesting new species in the palm genus Syagrus (fig. 7). At first glance, the specimens (collected near Mucugé) strongly resemble S. werdermannii, an acaulescent, endemic confined to the Caetité area, about 150 km southeast of Mucugé. A comparative study of the gross morphology and leaf anatomy, however, indicates a distinct, new species.

Syagrus harleyi Glassman, sp. nov. Palma acaulis. Folia aequaliter pinnatisecta petiolo non dentato rachidi 93-136 cm longa pinnis utrimque 25. Spathae pars inflata 34-51 cm longa 2.5-3 cm lata. Spadix pars ramosa 17-21 cm longa rachillae 17-22, 6-12 cm longae. Flores masculi 4-5 mm longi; flores feminei 4.5-6 mm alti 4.5-5 mm lati. Fructus 1.5-2.5 cm longus 1.1-2.5 cm diam.

Acaulescent palm. Petiole 33 cm long and 1 cm wide, margins smooth or fibrous, sheathing base 25-30 cm long; leaf rachis 93-136 cm long, pinnae 25 pairs per leaf, middle ones more or less evenly spaced, not clustered, 43 cm long and 2.5 cm wide, mostly with asymmetrical tips, dark green above, glaucous below; expanded part of spathe 34-51 cm long and 2.5-3 cm wide, deeply plicate-sulcate, more or less glabrous, peduncular part 45-62 cm long; branched part of spadix 17-21 cm long, rachillae 17-22 in number, 6-12 cm long, peduncular part 62 cm long; male flowers 5 mm long on lower part, 4 mm on upper part; female flowers rounded, 4.5-6 mm long, 4.5-5 mm in diam, calyx and corolla more or less nerved, about equal in size; fruits 8-10 per rachilla, immature ones ovoid, 1.5 cm long and 1.1 cm in diam, covered with brown tomentum, persistent perianth 0.5 cm high, usually one-seeded, occasionally with two seeds, seeds 6-7 mm long, 5 mm in diam, mature fruits orange, 2.5 cm long, 2.5 cm in diam, endocarp cavity trivittate, endocarp bony, 1-2 mm thick.

Specimens examined: Brazil, Bahia Serra do Sincorá, by Rio Cumbuca ca 3 km S. of Mucugé, riverside, damp sandy soil,

* This work has been supported by National Science Foundation Grant BMS 7509779.

sandstone rocks and partly burnt over vegetation, alt. 850 m., Feb. 4, 1974, Harley et al. 15963 (K, holotype; BH, F, MO, NY, US, isotypes); Bahia, south of Andaraí, 16 km along road to Mucugé, near small town of Xique-Xique, sandstone rocks intersected by small streams, alt. 700-900 m, Feb. 14, 1977, Harley et al. 18696 (K).

Vernacular names: none recorded.

Distribution: Brazil state of Bahia, common along road between Mucugé and Andaraí, approx. 41°19'W, 12°54'S, along streams in sandy soil and sandstone rocks, a conspicuous element in the "campo rupestre" vegetation.

As previously mentioned, the new species seems to be most closely related to S. werdermannii. In fact, Bondar (1964) thought that he had observed S. werdermannii in Mucugé, but he probably saw S. harleyi. The new taxon apparently belongs to a group of species with a similar leaf anatomy pattern e.g., S. vagans, S. ruschiana and S. schizophylla, (Glassman, 1972a) as well as S. microphylla (Glassman, 1977) and S. werdermannii (see figs. 1-6). These illustrations show that the adaxial nonvascular fibers occur as very common, elongate clusters; whereas, on the abaxial side they appear as much smaller, spherical clusters which are only about one-half as common as the adaxial fibers. Of the six taxa, S. harleyi is the most distinctive, i.e., the clusters of adaxial nonvascular fibers are unequal in size, thicker, and not as common as the others.

Even though this group of species if linked by a unique leaf anatomy pattern (for Syagrus), they can be easily distinguished morphologically, for the most part. In fact, one of the species, S. schizophylla, is usually placed in another genus (Arikuryroba) because of its spiny petioles and ruminant endosperm. The following key differentiates the taxa:

1. Plants mostly acaulescent, pinnae 0.8-2.5 cm wide.
 2. Petiole margins sparsely spiny on basal third, smooth or fibrous on upper two-thirds, expanded part of spathe 85-106 cm long and 8 cm wide, peduncular part of spadix 107 cm long, branched part 55-60 cm long, rachillae 42-45 in number S. vagans
 2. Petiole margins smooth or merely fibrous throughout, expanded part of spathe 13-48 cm long and 2-5 cm wide, peduncular part of spadix 17-72 cm long, branched part 9-40 cm long, rachillae 4-18 in number.
 3. Plants mostly prostrate, middle pinnae consistently in tight clusters of 2-3, 10-22 cm long, peduncular

part of spadix 17-31 cm long, rachillae 4-6 in number S. microphylla

3. Plants mostly upright, middle pinnae not clustered or occasionally clustered, 43-45 cm long, peduncular part of spadix 62-72 cm long, rachillae 11-22 in number.

4. Leaf rachis 93-136 cm long, middle pinnae 2.0-2.5 cm wide, not clustered, branched part of spadix 17 cm long, rachillae 17-22 in number, each 6-12 cm long S. harleyi

4. Leaf rachis 50-59 cm long, middle pinnae 1-2 cm wide, single or occasionally in clusters of 2-3, branched part of spadix 30-40 cm long, rachillae 11-14 in number, each 22-25 cm long S. werdermannii

1. Plants aborescent, trunks 2-8 m tall, pinnae 3.5-4 cm wide.

4. Trunks 2-4 m tall, petiole margins densely spiny, endosperm of seed ruminant S. schizophylla

4. Trunks 4-8 m tall, petiole margins smooth or merely fibrous, endosperm of seed homogeneous . . S. ruschiana

Besides their similar leaf anatomy pattern, the six species under consideration also have the following morphological characteristics in common: spathes plicate-sulcate, female flowers 4-8 mm long and 3-7 mm in diam, male flowers 2-6 mm long above, 4-9 mm long below, and pinnae 0.8-4.0 cm wide with oblique, asymmetrical tips.

The above species of Syagrus occur mostly in Bahia, but a few are also found in the adjacent states of Espirito Santo, Minas Gerais and Pernambuco. Apparently, none have overlapping ranges since most of the taxa have limited distributions. Syagrus vagans is very common in caatingas between Brumado and Lagedo Alto in east-central Bahia (figs. 15-17); S. werdermannii is endemic to caatingas in the Caetité area in Central Bahia; S. harleyi is confined to sandy soil or sandstone rocks near streams in a small area between Mucugé and Andaraí; S. microphylla is endemic to caatingas in the Morro de Chapéu area; S. schizophylla is found mainly on sandy soil in Atlantic coastal areas from southeastern Bahia to Pernambuco (figs. 11-14); and S. ruschiana is endemic to black gneissic rocks in limited areas of Espirito Santo and adjacent Minas Gerais (figs. 8-10).

I have considered placing all six taxa in a separate section of the genus Syagrus; but this realignment, as well as others,

will be deferred until a thorough revision of Syagrus and allied genera is completed. A number of knotty problems must be resolved, however, before such a revision is realized. In a previous paper (Glassman, 1970), I placed S. ruschiana with S. botryophora (Mart.) Mart. in section Syagropsis; and S. vagans and S. schizophylla in section Butia with five other species which I have since transferred to the genus Butia (Glassman, in press).

In order to clarify their relationship, a detailed taxonomic treatment of each of the five remaining species (S. ruschiana, S. schizophylla, S. vagans, S. werdermannii and S. microphylla) is given below.

Syagrus ruschiana (Bondar) Glassman, Rhodora 65:261. 1963;

Cocos ruschiana Bondar, Bol. Inst. Centr. Fom. Econ. Bahia 9:45. figs. 10-13. 1941. Arikuryroba ruschiana (Bondar) Toledo, Arq. Bot. São Paulo 2:6. 1944.

Lectotype: Brazil, Espírito Santo, Colatina and S. Mateus, 1941, Bondar s.n. (F-620822). c.f. Glassman 1972b, p. 94.

Trunk 4-8 m tall, 4-12 cm in diam, often forming clumps. Petiole 90-103 cm long, about 1.5 cm wide near base, margins fibrous or smooth, not spiny, sheathing base 30-36 cm long; leaf rachis 163-200 cm long, 50-57 pairs of pinnae per leaf, not clustered, middle ones 50-53 cm long, 2.4-3.5 cm wide, with asymmetrical tips, usually glaucous on both surfaces, becoming eglaucous with age, expanded part of spathe 100-110 cm long, 5-6 cm wide and 1 mm thick, more or less brittle in texture, deeply plicate-sulcate, slightly whitish-brown tomentose to glaucous, peduncular part 68-70 cm long; branched part of spadix 90-98 cm long, rachillae 80-100 in number, 50-55 cm long, peduncular part 70-74 cm long; male flowers 8-9 mm long on lower part, 3-6 mm long on upper part, sepals irregular in size and shape, 0.5-2.5 mm long; female flowers rounded or ovoid 3.5-6 mm long, 3-5 mm in diam, petals and sepals distinctly striated; mature fruit 2.5 cm long, 2.0 cm in diam, with very short beak, endocarp cavity trivittate, smooth, endocarp 1-2 mm thick; seed 1.4 cm long and 1.3 cm in diam, endosperm homogenous.

Specimens examined: Brazil (see lectotype above); Espírito Santo, 1946, Bondar s.n. (F-404604-5); 13 km E. of Colatina (5 km W. of Baunelha), confined to black gneissic rocks, associated with columnar cacti, about 100 trees seen, July 10, 1969, Glassman & Costa 8743 (CHI); Minas Gerais, Rodovia Nanuque-Teófilo Otoni, serra rochosa, Aug. 14, 1965, Belem 1628 (BH,UB). Doubtful. Espírito Santo, Rio Pancos, Colatina, Dec. 8, 1943, J. G. Kuhlmann s.n. (RB-62960)-without leaves.

Vernacular names: Colatina, Coco de pedra.

Distribution: native to Brazil in restricted areas of Espirito Santo and adjacent Minas Gerais, apparently confined to black gneissic rocks.

No specimens were cited by Bondar in his original article (1941), therefore his earliest collection was designated as the lectotype. Bondar originally described S. ruschiana as having seeds with ruminant endosperm which later prompted Toledo (1944) to transfer this species to the genus Arikuryroba. Unquestionably, Bondar was in error because the endosperm is homogeneous. Even though this taxon has homogeneous endosperm and smooth petiole margins, it seems to be most closely related to S. schizophylla (with ruminant endosperm and spiny petiole margins) because other morphological characters are similar and the leaf anatomy pattern in both species is almost identical.

Bondar (1964) gave the following locality data for S. ruschiana: in gneissic rocks on the banks of Rio Doce in Colatina, and in the municipio of São Mateus, about 1000 m alt. During my trip to Brazil in 1969, I was unable to find this palm in the above localities, but only in the area cited previously by me (about 5 km W. of Baunilha).

Syagrus schizophylla (Martius) Glassman, Fieldiana Bot. 31: 386. 1968; Cocos schizophylla Martius, Fl. Bras. 2:119. t. 85. 1826; Arikury schizophylla (Martius) Beccari, L'Agric. Colon. 10:455. 1916; Arikuryroba schizophylla (Martius) Bailey, Gentes Herb. 2:196. 1930.
Lectotype: Brazil, Bahia, Martius 1924 (M). c.f. Dahlgren 1959, pl. 7.
Arikuryroba capanemae Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio. de Jan. 1:6, t.3, fig. 1, 1891; Sert. Palm. Bras. 1:t. 90A. 1903; Cocos capanemae (Barb. Rodr.) Drude, Engler & Prantl Pflanzenfam. Nachtr. 1:57. 1897; Cocos arikuryroba Barb. Rodr., Palm. Mattogross. Nov. 25, 1899.
Lectotype: Brazil, Bahia (Barbosa Rodrigues 1891, t.3, fig. 1). c.f. Glassman 1972 b, p. 13.

Trunk 2-4 m tall, frequently in clumps, sometimes flowering when acaulescent. Petiole 90-100 cm long, 4 cm wide at base, margins armed short, curved teeth (often irregularly spaced) for most of its length, teeth longer toward base (5mm), becoming shorter toward apex (1-2 mm); sheathing base 19-21 cm long, with fibrous and coarsely spiny margins; leaf rachis 135-145 cm long, 40-43 pairs of pinnae per leaf, not clustered, often widely spaced, middle ones 56-59 cm long, 2.5-4.0 cm wide, with strongly oblique and asymmetrical tips, the margins of tips fre-

quently laciniate, mostly glabrous on both surfaces; expanded part of spathe 65-70 cm long, 5-6 cm wide, deeply plicate-sulcate; branched part of spadix 55-60 cm long, rachillae 28-32 in number, 26-28 cm long, peduncular part 65-71 cm long; male flowers 5-7 mm long on lower part, 3-5 mm long on upper part, sepals about 1 mm long; female flowers rounded or ovoid, 4.5-8 mm long, 3-6 mm in diam, sepals mostly with hooded, imbricate tips; mature fruit 2.5-3.0 cm long, 2.2-2.5 cm in diam, with short beak, endocarp cavity trivittate, smooth, endocarp 1-3 mm thick; seed 1.7 cm long, 1.4 cm in diam, endosperm ruminant.

Specimens examined: Brazil, Pernambuco, Cabo de Santo Agutinho, D.A. Lima s.n. (IPA-53-1655); Porto de Galinhas Estação Experimental de Litoral Ipa, Paulo Ferreira s.n. (IPA-67-35); in restinga, Glassman & Costa 8708 (CHI). Bahia, Martius 1924 (M, lectotype of Cocos schizophylla); Martius 1853 (P); Blanchet 4 (G); Blanchet 40 (P); Salvador, Bondar s.n. (F-404610, 620750, 6119774); between Amaralina and Pituba, Dahlgren s.n. (F-620690); Ilheus, H.M. Curran 437 (F); Porto Seguro, A.P. Duarte 5977 (RB); Pituba, suburb of Salvador, in clumps along beach, coconut grove, Glassman & Costa 8721, 8722 (CHI); 7 km S. of Ilheus, along sandy beach, Glassman & Costa 8741 (CHI). Cultivated: Brazil, W. Accorsi s.n. (SP-51.563), Dahlgren s.n. (F-611536); British Guiana, Dahlgren s.n. (F-610650); Cuba, Jack 4482 (A); Florida, Dahlgren 50/052 (F). Vernacular Names: Aricury, Ariry Guriri, Nicury, Aricuryroba, Nicuryroba.

Distribution: Native to Brazil in the states of Pernambuco and Bahia, mostly limited to sandy soil close to the Atlantic coastal areas.

Even though S. schizophylla is so distinct morphologically (spiny petiole margins and seeds with ruminant endosperm) that it is recognized as a separate genus by many authors, this taxon appears to be closely related to a group of species (S. ruschiana, S. vagans, S. werdermannii, S. harleyi and S. microphylla) with a strikingly similar leaf anatomy pattern.

Syagrus schizophylla is known to cross with S. coronata (where their ranges overlap in coastal Bahia to produce the hybrid, S. x tostana (Bondar) Glassman. This hybrid is apparently rare because it is known from only a few collections.

Syagrus vagans (Bondar) Hawkes, Arq. Bot. S. Paulo 2:178. 1952. Cocos vagans Bondar, Field Mus. Nat. Hist. Bot. 22:457. 1942.

Lectotype: Brazil, Bahia, Bondar s.n. (F-619777). c.f.

Glassman 1972b, p. 95.

Acaulescent, usually growing in clumps. Petiole 76-80 cm long, about 1.5 cm wide near base, margins armed with short teeth for at least the lower third of its length, sometimes edentate; sheathing base 30-32 cm long, margins fibrous intermixed with short teeth; leaf rachis 100-110 cm long, 34-36 prs. of pinnae per leaf, in loose clusters of two, or single, usually glaucous on both surfaces, middle ones 50-54 cm long, 2.0-2.5 cm wide, mostly with oblique, asymmetrical tips; expanded part of spathe 85-106 cm long, 8 cm wide, deeply plicate-sulcate, brownish tomentose or glaucous, peduncular part 100-107 cm long; branched part of spadix 60-65 cm long, rachillae 42-46 in number, 41-43 cm long, peduncular part 105-107 cm long; male flowers 4-7 mm long on lower part, 3-4 mm long on upper part; female flowers rounded, 5-7 mm long, 5-7 mm in diam, sepals slightly shorter than petals in older flowers; fruit elliptical-ovoid, 2.8-3.7 cm long, 1.5-1.8 cm in diam, beak 2-3 mm long, endocarp woody, 1-2 mm thick along sides; locule one, seed angular or round in cross section, 1.9-2.4 cm long, 0.8-1 cm in diam, endosperm homogeneous.

Specimens examined: Brazil, Bahia (see lectotype above); Santa Teresinha, Bondar s.n. (F-619778, 620715, 620752); Bondar 1559 (SP); 30 km N. of Jequié, para Milagres, Belém & Mendes 242 (BH); 20 km N. of Lagedo Alto, caatinga, common, Glassman & Costa 8709 (CHI); 5-10 km W. of Lagedo Alto, caatinga, abundant, Glassman & Costa 8710, 8711, 8712, 8713 (CHI); 20 km N. of Maracás, Morros, in caatinga, very local or sparse, Glassman & Costa 8717, 8718, 8719 (CHI); 22 km E. of Brumado, caatinga, about 50 clumps seen, Glassman & Costa 8725, 8726 (CHI). Cultivated. Florida, Fairchild Tropical Garden, Moore 7715, 8965, 9372 (BH); Read 9372 (BH, FAIR).

Vernacular names: Ariri, Licurioba

Distribution: Brazil, confined to caatingas in the east-central part of Bahia, from Lagedo Alto and Santa Teresinha on the north and east, Jequié to the south, and southwest to Brumado; associated with Syagrus coronata (Mart.) Becc. over much of its range, and hybridizes with it near Lagedo Alto to produce Syagrus x matafome (Bondar) Glassman.

In his 1942 article, Bondar cited all specimens for each new species described (four species of Cocos and four species of Attalea) as isotypes deposited in the Field Museum. From this information it was assumed that at least one other set of specimens existed in Brazil. After a number of inquiries and searching over a period of years, however, I have been unable to locate any other sets of specimens for the taxa described in the above article. Therefore, I have designated all specimens called isotypes by Bondar (1942) as lectotypes.

Syagrus vagans seems to be most closely related to S. schizophylla because of the similarity in size and shape of both male and female flowers, spiny petiole margins and an almost identical leaf anatomy pattern; but it can easily be distinguished by its acaulescent habit, narrower pinnae, smaller and sparser spines on the petiole margins, and the homogeneous endosperm. As mentioned earlier, the ranges of these two taxa apparently do not overlap; S. vagans grows in caatingas, whereas S. schizophylla is found mainly in sandy soil along beaches.

Syagrus werdermannii Burret, Fedde Rep. 32:109. 1933; Notizbl. 13:682. 1937; Glassman, Fieldiana Bot. 34:1-10, figs., 1-9. 1971.

Holotype: Brazil, Bahia, Caetité (Werdermann 3472-B, destroyed); Neotype: 15 km N.W. of Caetité (Glassman & Costa 8728-CHI). c.f. Glassman, 1971, p. 7.

Acaulescent, growing in clumps. Petiole 34-36 cm long, 1 cm wide, margins smooth or fibrous, sheathing base about 20 cm long; leaf rachis 56-60 cm long, pinnae 18-20 pairs per leaf, middle ones single or occasionally in clusters of 2-3, 40-45 cm long, 1-2 cm wide, with asymmetrical tips, glaucous on both surfaces, becoming eglaucous with age; expanded part of spathe 40-48 cm long, 3-5 cm wide, deeply plicate-sulcate, covered with dense brown tomentum, becoming glabrous with age; branched part of spadix 30-40 cm long, rachillae 11-14 in number, 22-25 cm long, peduncular part 50-72 cm long; male flowers 6-7 mm long on lower part, 4-5 mm long, in upper part; female flowers triangular or ovoid, 4-6 mm long, 4 mm in diam, calyx brownish, distinctly striated or nerved, often shorter than the yellowish smooth corolla; mature fruits ovoid or obovate, 1.8-2.5 cm long, 1.3-1.5 cm in diam, beak 4 mm long, endocarp woody, 1.0-1.5 cm thick, locule one, seed not seen.

Specimens examined: Brazil, Bahia, Situ do Ouro, 15 km N.W. of Caetité, about 100 clumps seen in caatinga, associated with Bactris tucum, Glassman & Costa 8728 (CHI, neotype); 8729 to 8739, inclusive (CHI).

Distribution: Brazil, Bahia, endemic to caatingas, approximately within an 80 km radius of Caetité.

Vernacular name: Coco da vassoura.

In his original article, Burret (1933) said that this taxon seemed to be related to Syagrus petraea (Mart.) Becc., an acaulescent palm with unclustered pinnae and unbranched spadices; in my 1971 article I linked S. werdermannii with another acaulescent species, S. campylospatha (Barb. Rodr.) Becc.; and in 1977, I compared it with S. microphylla. Even

though S. werdermannii has a leaf anatomy pattern similar to both S. microphylla and S. vagans, it probably is more closely aligned to the latter taxon because of the more similar morphological characteristics.

Syagrus microphylla Burret, Fedde Rep. Nov. Spec. 32:111. 1933; Glassman, Phytologia 38:66-68, fig. 1. 1977.
Holotype: Brazil, Bahia, Serra do Espinhaço, Östlich Monte Chapeo, open plain, April, 1932, (Werdermann 3366-B, destroyed). Neotype: Bahia, Serra do Tombador, 6 km S. of town of Morro de Chapeu, 1100 m elevation, Feb. 1971 (H. Irwin, R. M. Harley & G. L. Smith 32470 UB). c.f. Glassman 1977, p. 66.

Acaulescent, often with a prostrate or flattened appearance. Petiole 7-12 cm long, margins smooth, sheathing base about 7 cm long; rachis of leaf 29-45 cm long, pinnae 20-21 pairs, middle ones in tight clusters of 2-3, densely glaucous, especially above, 10-22 cm long, 0.8-2.0 (2.5) cm wide, tips obtuse and asymmetrical; expanded part of spathe 13-15 cm long and 2-3 cm wide, peduncular part 23-30 cm long, mostly glabrous, plicate-sulcate outside; branched part of spadix 9-13 cm long, peduncle 17-31 cm long, rachillae 4-6 in number, lower ones 5-10 cm long; male flowers 4-6 mm long, sepals 0.5-1 mm long; female flowers more or less triangular in shape, 5-7 mm long, 3-5 mm in diam, fruits rounded to ovoid, 1.5-2.2 cm long, 1.0-1.3 cm in diam, persistent perianth 0.5-0.7 cm high, endocarp woody, about 1 mm thick, one locule, seed not seen.

Specimens examined: Brazil, Bahia (see neotype above); Serra do Tombador, 2 km S.W. of Morro de Chapeu, on road to Utinga, caatinga vegetation, assoc. with Allagoptera and various cacti, very local for radius of about 5 km on white sandy soil, common here, Aug. 1976, Glassman 13018, 13019, 13020, 13021, 13023, 13025, 13026, 13027, 13028, 13029, 13030, (CHI, SP).

Vernacular names: none recorded.

Distribution: Brazil, state of Bahia, apparently endemic to the Morro de Chapeu mountain area, primarily on white sandy soil in the caatinga.

Burret (1933) was in error when he placed Monte Chapeo (Morro de Chapeu) in the Serra do Espinhaço. No mountain range of this name exists in the area, but there is a Serra do Espinhaço running through Diamantina, in the state of Minas Gerais. Morro de Chapeu properly belongs in the Serra do Tombador mountain range. The above cited specimens match Burret's descrip-

tion of S. microphylla fairly closely, and undoubtedly were collected in the same general area of the type locality; therefore, I have chosen one of these specimens (Irwin et al. 32470) as the neotype.

Syagrus microphylla is a distinct species, nevertheless the leaf anatomy pattern apparently links it to the other five taxa discussed here. Its closest relatives are probably S. harleyi and S. werdermannii, but it can be easily distinguished from them by the prostrate habit, the tightly clustered, very short middle pinnae, relatively short peduncle and a spadix with only 4-6 rachillae.

LITERATURE CITED

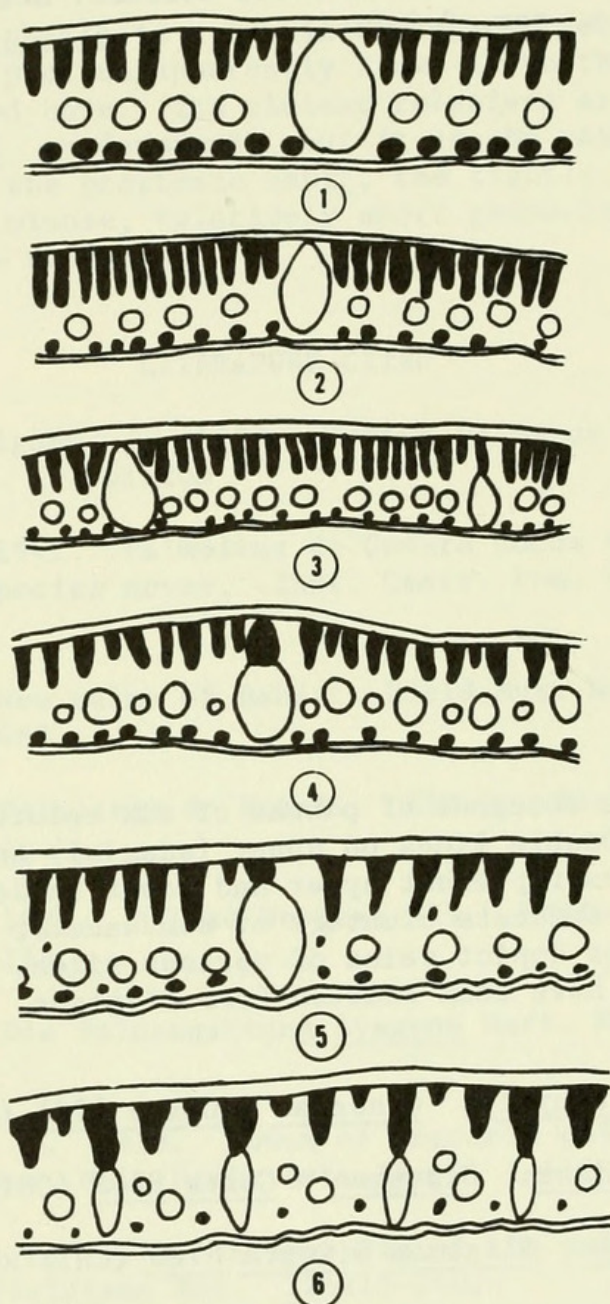
- Barbosa Rodrigues, J. 1903. Sertum Palmarum Brasilensium....
1:1-140. 91 plates
- Bondar, G. 1941. Palmeiras do Genero Cocos e descrição de duas especies novas. Inst. Centr. Fom. Econ. Bahia Bol. 9:1-53.
1942. New palms of Bahia. Field Mus. Nat. Hist. Bot. 22:457-463.
1964. Palmeiras do Brasil. 159 pp. Instituto de Botanica, São Paulo.
- Burret, M. 1933. Palmae Neogae III. Fedde Rep. Nov. Spec. 32:102-115.
1937. Die Palmengattung Syagrus Mart. Notizbl. 13:677-696.
- Dahlgren, B. E. 1959. Index of American palms. Plates. Field Mus. Nat. Hist. Bot. 14:pl. 1-412.
- Glassman, S. F. 1970. A synopsis of the palm genus Syagrus Mart. Fieldiana Bot. 32:215-240.
1971. Rediscovery of Syagrus werdermannii Burret, Fieldiana Bot. 34:1-10.
- 1972a. Systematic studies in the leaf anatomy of palm genus Syagrus. Am. Journ. Bot. 59:775-788.
- 1972b. A revision of B. E. Dahlgren's Index of American Palms. 294 pp. J. Cramer, Lehre, Germany.
1977. Notes on Syagrus microphylla Burret. Phytologia 38:66-68.

1978. New species in the palm genus Butia Becc. with a re-evaluation of the genus. (in press).

Toledo, J. F. 1944. Estudos sobre algumas Palmeiras do Brasil. I. Um Novo Genero da Tribu Coccoëae. Arq. Bot. Est. São Paulo n. ser. 2:3-9.

Figures 1-6. Cross sections of pinnae of six related species of Syagrus. Double lines on upper (adaxial) and lower (abaxial) sides represent upper and lower epidermis. Solid tissues indicate clusters of nonvascular fibers, whereas circles depict veins of various sizes. All other tissues have been omitted from diagrams.

- Figure 1. S. schizophylla. Glassman & Costa 8721 (CHI) x110
2. S. ruschiana. Glassman & Costa 8743 (CHI) x110
3. S. vagans. Glassman & Costa 8725 (CHI) x66
4. S. werdermannii. Glassman & Costa 8728 (CHI) x110
5. S. microphylla. Glassman 13018 (CHI) x110
6. S. harleyi. Harley et al. 15963 (F) x110



Figures 1-6. Cross sections of Pinnae of six related species of *Syagrus*.

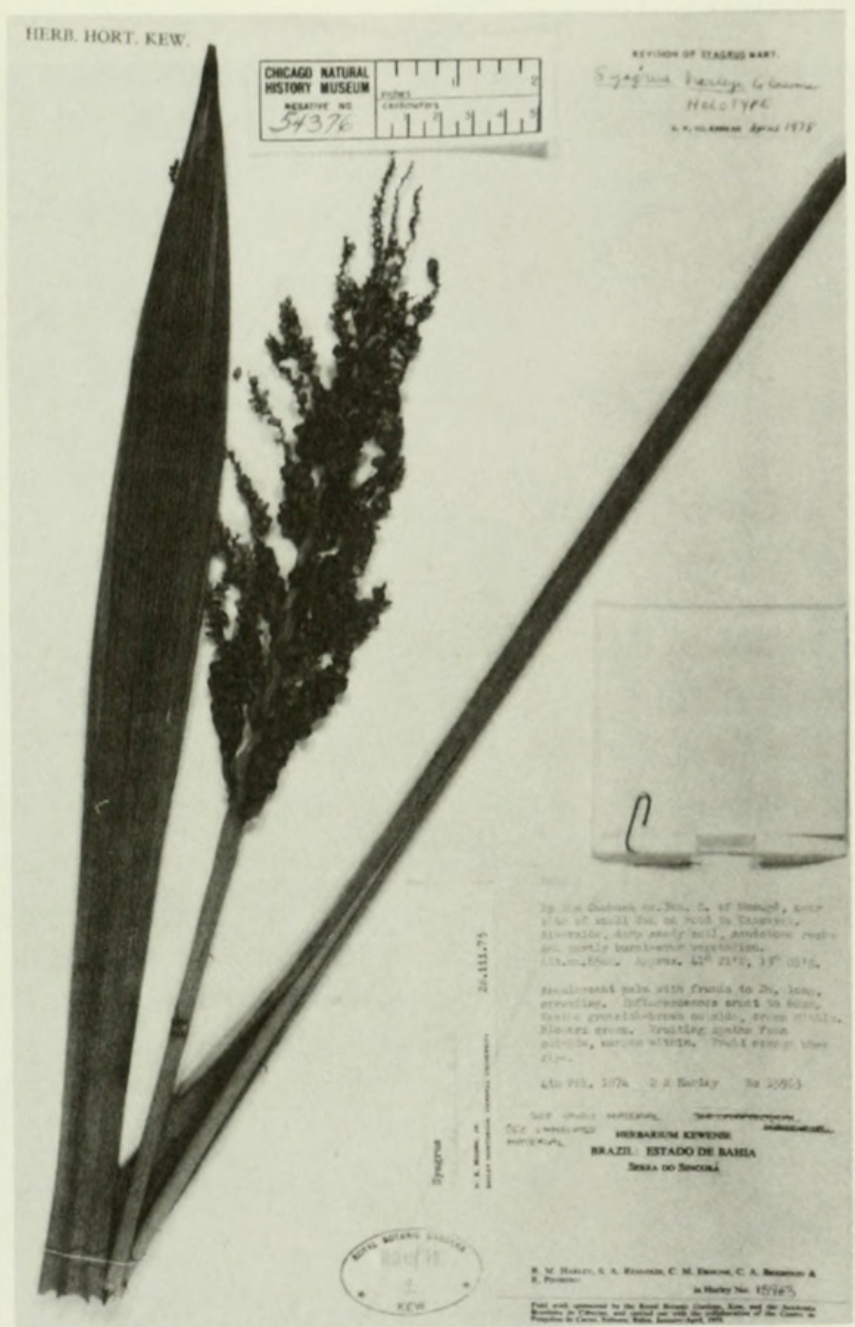


Figure 7. S. harleyi. Holotype. Harley et al. 15963 (K). Mature flowering spathe and spadix.

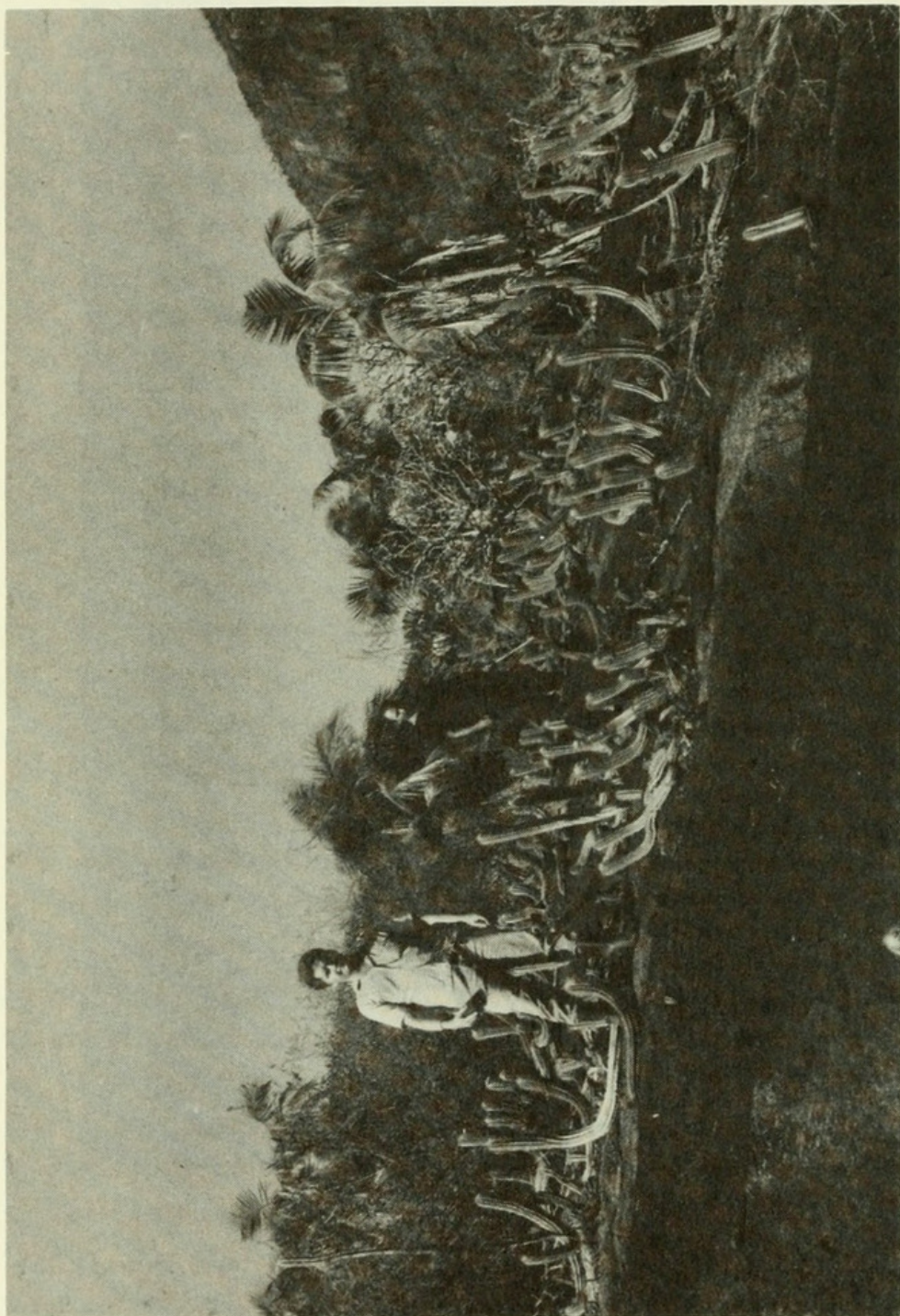


Figure 8. S. ruschiana. Stand of trees in background and columnar cacti growing on black gneissic rocks. 13 km E. of Colatina, Espirito Santo.

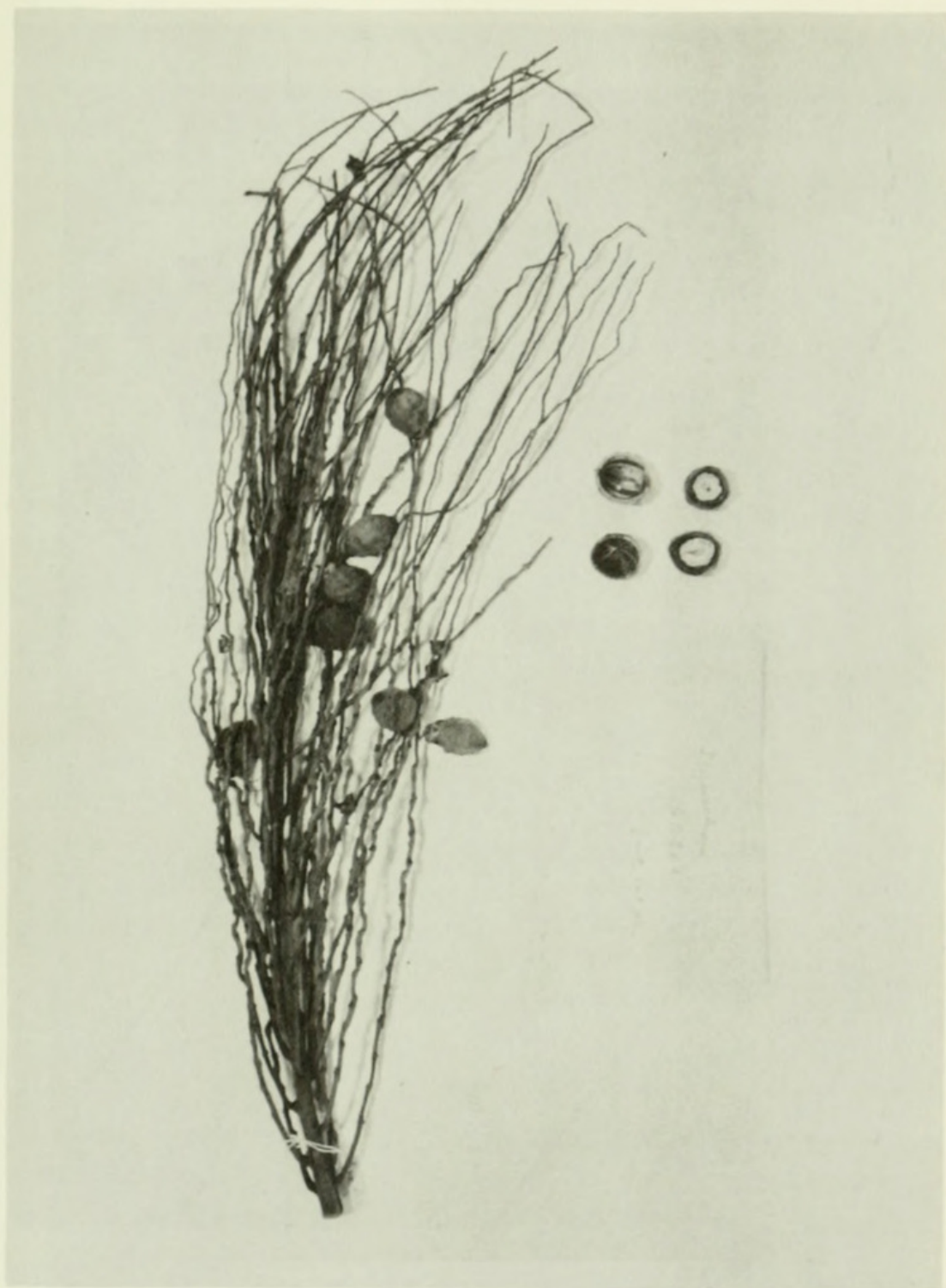


Figure 9. S. ruschiana. Lectotype. Bondar
s.n. (F-620822). Infructescence with
mature fruits, whole and sectioned.

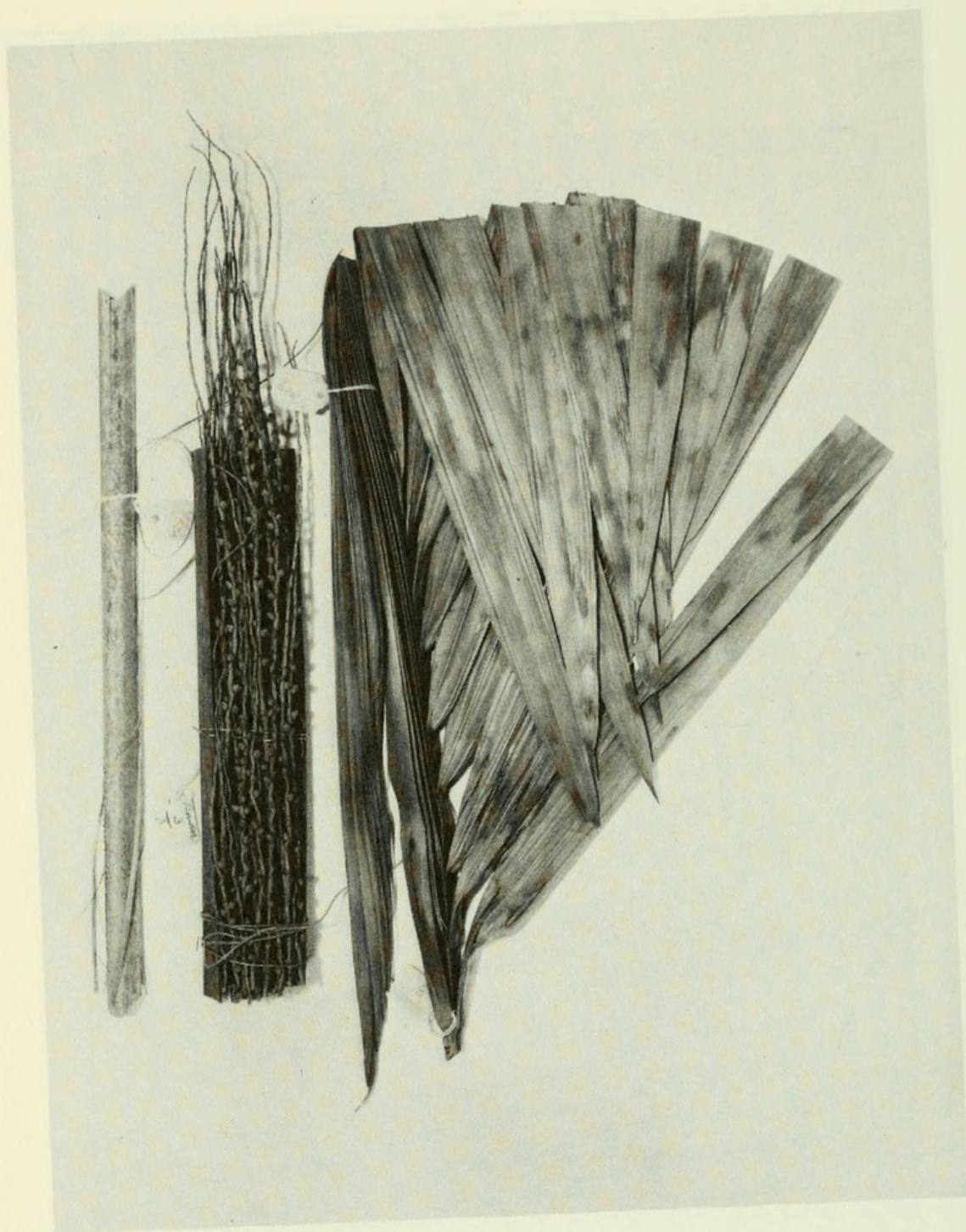


Figure 10. *S. ruschiana*. Lectotype. Bondar
s.n. (F-620822). Parts of inflorescence
and leaf.



Figure 11. S. schizophylla. Stand of young trees along beach near Pituba, Bahia.

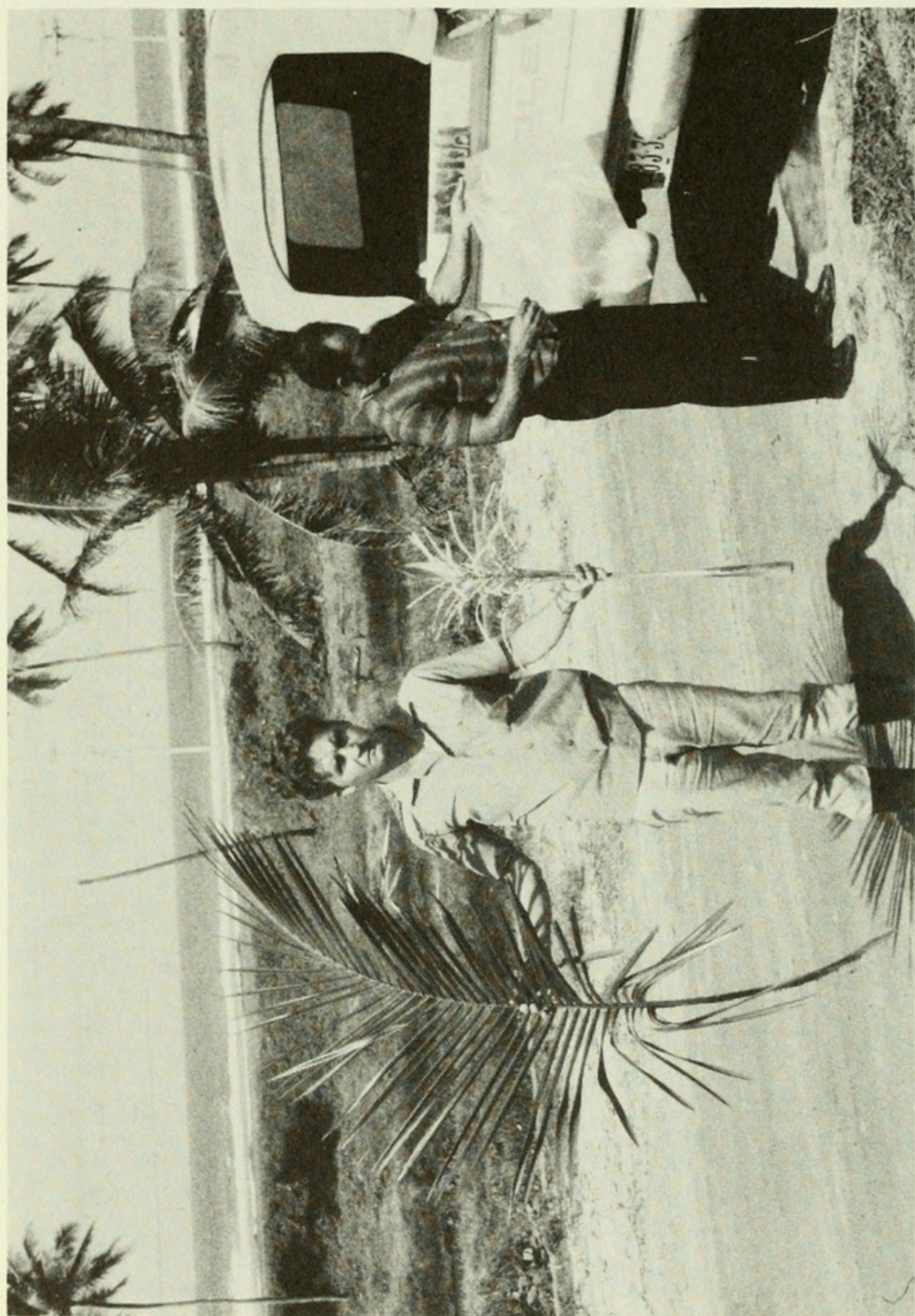


Figure 12. S. schizophylla. Mr. Costa holding leaf and inflorescence. Same locality as figure 11.

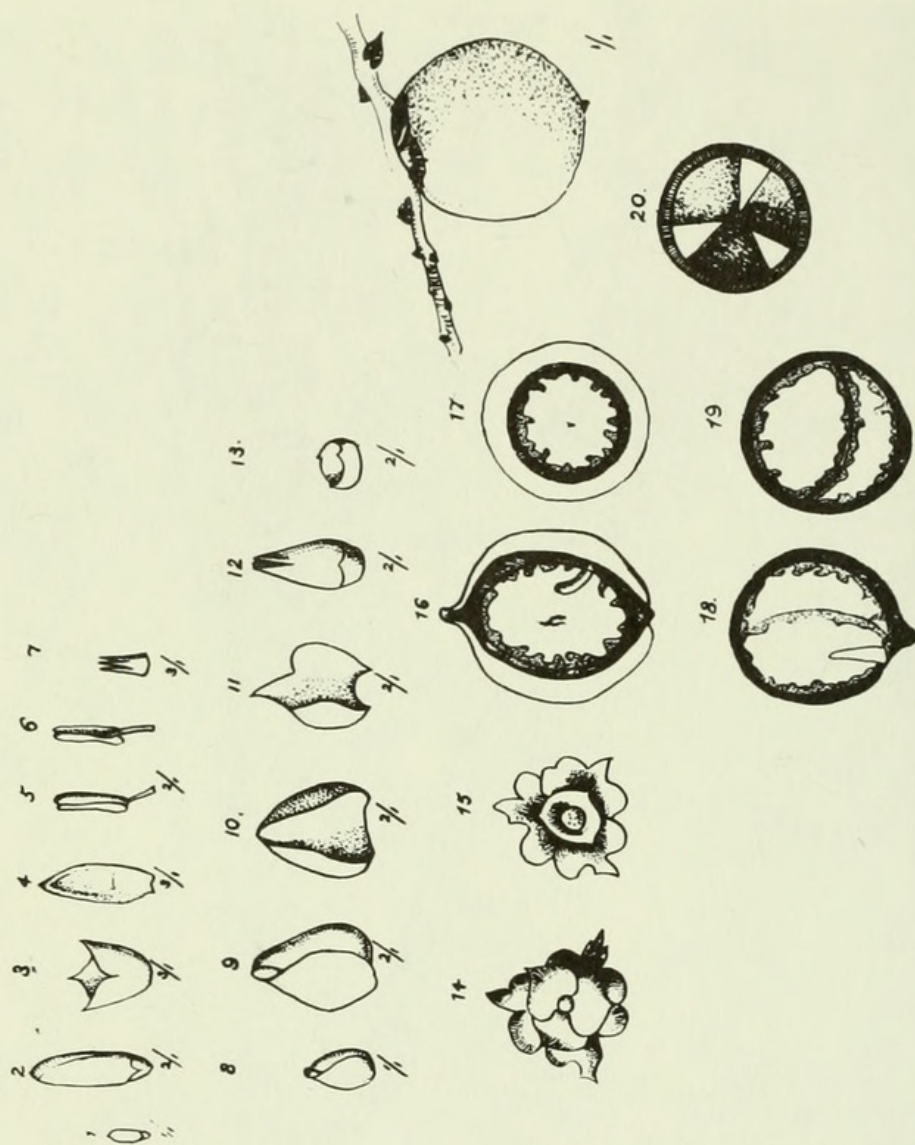


Figure 14. *S. schizophylla*. After Barbosa Rodrigues (1903), t. 90A. First row - male flowers, second row, female flowers. Third and fourth rows - persistent perianth and fruits, some showing ruminant endosperm of seed.



Figure 15. S. vagans. Mr. Costa holding
inflorescence and infructescence.
Lagedo Alto, Bahia.



Figure 16. *S. vagans*. Lectotype. Bondar
s.n. (F-619777). Infructescence and
inflorescence.

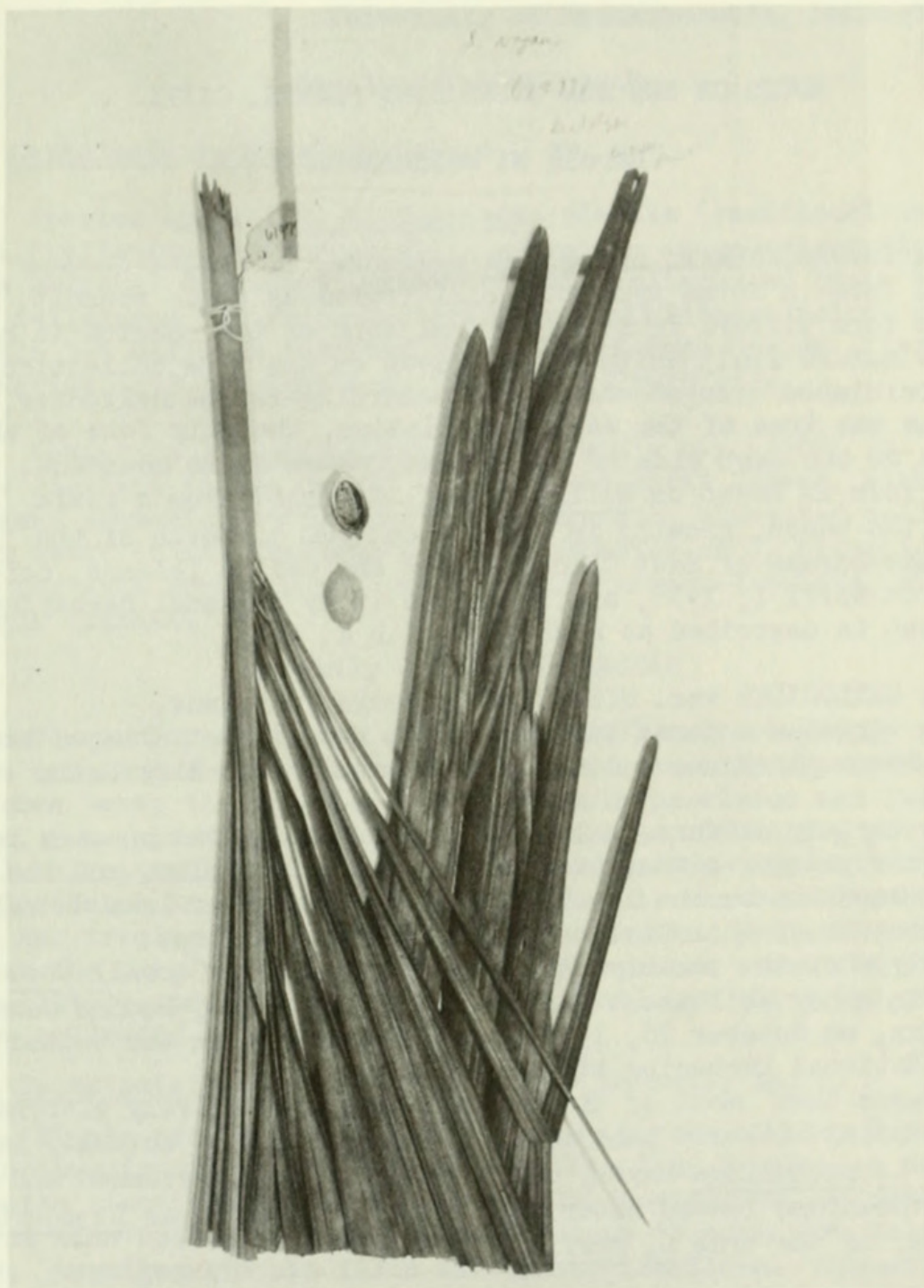


Figure 17. S. vagans. Lectotype., Part of leaf with fruits.



Glassman, Sidney F. 1978. "New species of *Syagrus* from the State of Bahia (Brazil), with a revisional study of closely related taxa." *Phytologia* 39(6), 401–423.

View This Item Online: <https://www.biodiversitylibrary.org/item/47392>

Permalink: <https://www.biodiversitylibrary.org/partpdf/219420>

Holding Institution

New York Botanical Garden, LuEsther T. Mertz Library

Sponsored by

The LuEsther T Mertz Library, the New York Botanical Garden

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Phytologia

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.