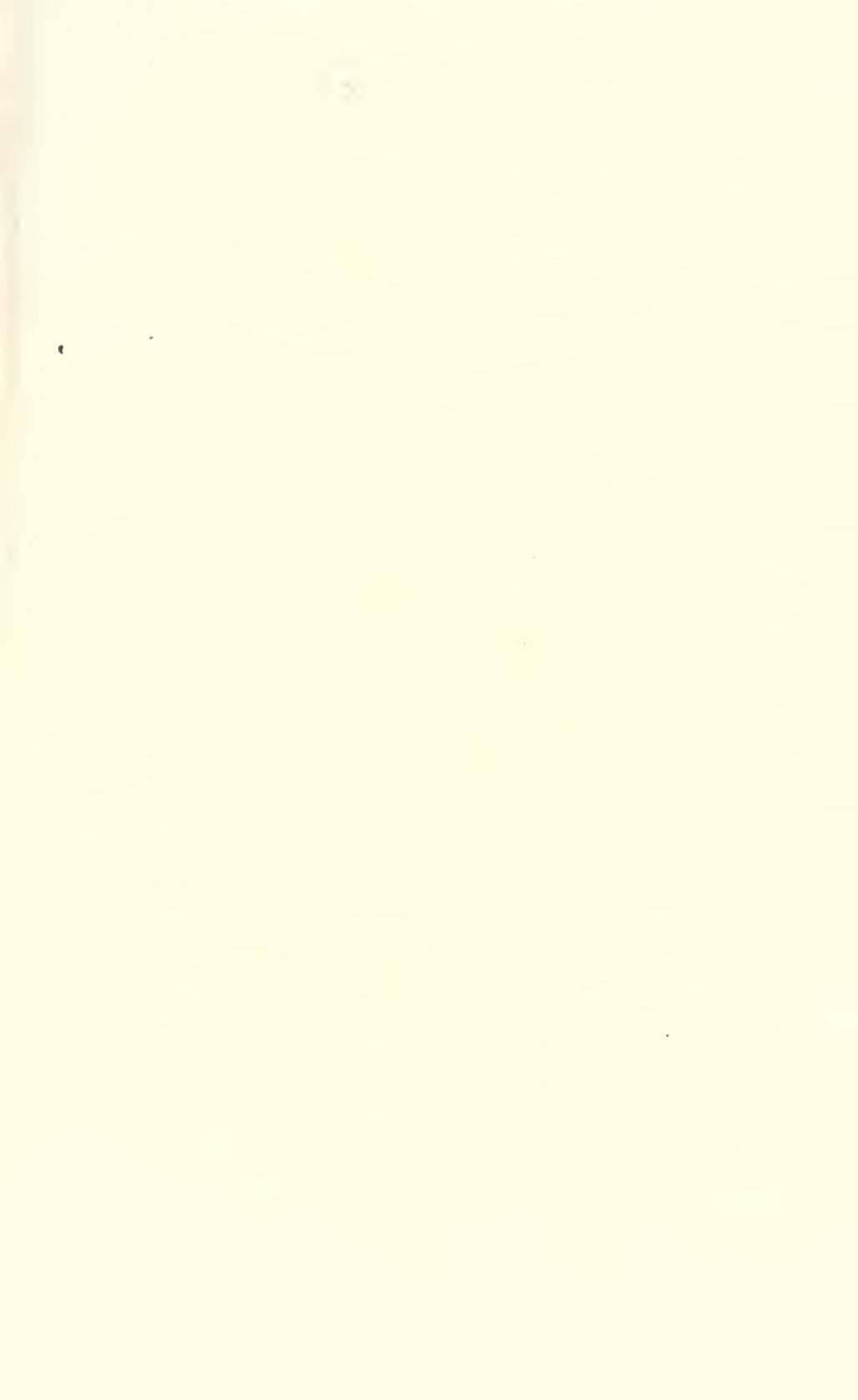




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# FIELDIANA: BOTANY

*A Continuation of the*

BOTANICAL SERIES

*of*

FIELD MUSEUM OF NATURAL HISTORY

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VOLUME 32



FIELD MUSEUM OF NATURAL HISTORY  
CHICAGO, U.S.A.



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*Boalagay*

## TABLE OF CONTENTS

1. A New Guatemalan <i>Spigelia</i> . By Dorothy N. Gibson . . . . .	1
2. Three New Nicaraguan Epidendrums. By Alfonso H. Heller . . . . .	7
3. <i>Syagrus oleracea</i> (Mart.) Becc. and Closely Related Taxa. By S. F. Glassman . . . . .	13
4. Tropical American Plants, X. By Louis O. Williams . . . . .	35
5. Two New Guatemalan Tournefortias. By Dorothy N. Gibson . . . . .	65
6. A New Member of <i>Morganella</i> . By Patricio Ponce de Leon. . . . .	69
7. A New <i>Odontoglossum</i> from Nicaragua. By Alfonso H. Heller . . . . .	73
8. Studies in the Palm Genus <i>Syagrus</i> Mart. II. By S. F. Glassman . . . . .	77
9. Revision of the Genus <i>Vascellum</i> (Lycoperdaceae). By Patricio Ponce de Leon. . . . .	109
10. A Conspectus of the Palm Genus <i>Butia</i> Becc. By S. F. Glassman . . . . .	127
11. Studies in American Plants, II. By Dorothy N. Gibson . . . . .	173
12. Tropical American Plants, XI. By Louis O. Williams . . . . .	179
13. The Juglandaceae of Guatemala. By Louis O. Williams and Antonio Molina R. . . . .	207
14. An Overlooked Genus of the Scrophulariaceae. By Louis O. Williams. . . . .	211
15. A Synopsis of the Palm Genus <i>Syagrus</i> Mart. By S. F. Glassman . . . . .	215
16. A New Hybrid in the Palm Genus <i>Syagrus</i> Mart. By S. F. Glassman . . . . .	241



A NEW GUATEMALAN *SPIGELIA*

DOROTHY N. GIBSON

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THREE NEW NICARAGUAN EPIDENDRUMS

ALFONSO H. HELLER

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*SYAGRUS OLERACEA* (MART.) BECC.  
AND CLOSELY RELATED TAXA

S. F. GLASSMAN

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TROPICAL AMERICAN PLANTS, X

LOUIS O. WILLIAMS

FIELDIANA: BOTANY

VOLUME 32, NUMBERS 1, 2, 3, 4

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AUGUST 19, 1968

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A NEW GUATEMALAN *SPIGELIA*

DOROTHY N. GIBSON

*Custodian of the Herbarium  
Field Museum of Natural History*

---

THREE NEW NICARAGUAN EPIDENDRUMS

ALFONSO H. HELLER

*Associate, Field Museum of Natural History*

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*SYAGRUS OLERACEA* (MART.) BECC.  
AND CLOSELY RELATED TAXA

S. F. GLASSMAN

*Research Associate, Palms  
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---

TROPICAL AMERICAN PLANTS, X

LOUIS O. WILLIAMS

*Chief Curator, Botany  
Field Museum of Natural History*

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## CONTENTS

A New Guatemalan <i>Spigelia</i> by Dorothy N. Gibson . . . . .	5
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<i>Syagrus oleracea</i> (Mart.) Becc. and Closely Related Taxa by S. F. Glassman . . . . .	13
Tropical American Plants, X by Louis O. Williams . . . . .	35

*Syagrus oleracea* (Mart.) Becc. and  
Closely Related Taxa<sup>1</sup>

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UNIVERSITY OF ILLINOIS, CHICAGO CIRCLE

Distinguishing *Syagrus oleracea* from some other members in the genus, as is the case with many genera of palms, is difficult because of inadequate descriptions and insufficient material collected from each tree. This species, which is distributed mainly in eastern Brazil, was originally described by Martius under *Cocos* in 1826. His description is rather lengthy, but certain diagnostic characters are omitted (i.e., width of middle pinnae, length and width of spathe, length of branched part of spadix, length of individual spadix branches, and size of female flowers). Included with Martius' description is an illustration (*t.* 82) which shows a partially opened spathe, part of a spadix, the upper third of a leaf with the terminal pinnae removed, and several male and female flowers (fig. 1). An illustration by Barbosa Rodrigues (1903, *t.* 84) also shows fruits (fig. 2). The lectotype (*Martius 1595*, M) consists of parts of a leaf, a spathe, parts of a spadix, and a package of male and female flowers. Many other herbarium specimens (more than 30 numbers) of *S. oleracea* have been seen by me, but most of these lack certain diagnostic parts.

During the summer of 1965 I made rather extensive collections of complete leaves, spathes and spadices and mature flowers and fruits of this species in the state of São Paulo, Brazil (Glassman & Gomes 8001, 8003, 8006, 8009, CHI). After comparing these specimens with others I had studied and after observing hundreds of trees in São Paulo, I now have a much clearer picture of the morphological limits and range of variation of *Syagrus oleracea*. Below is the synonymy for this species, followed by an emended description.

<sup>1</sup>This study has been supported by National Science Foundation Grant GB 3737.



*COCOS oleracea*.

FIG. 1. *Cocos oleracea*. After Martius, 1826, *t.* 82.

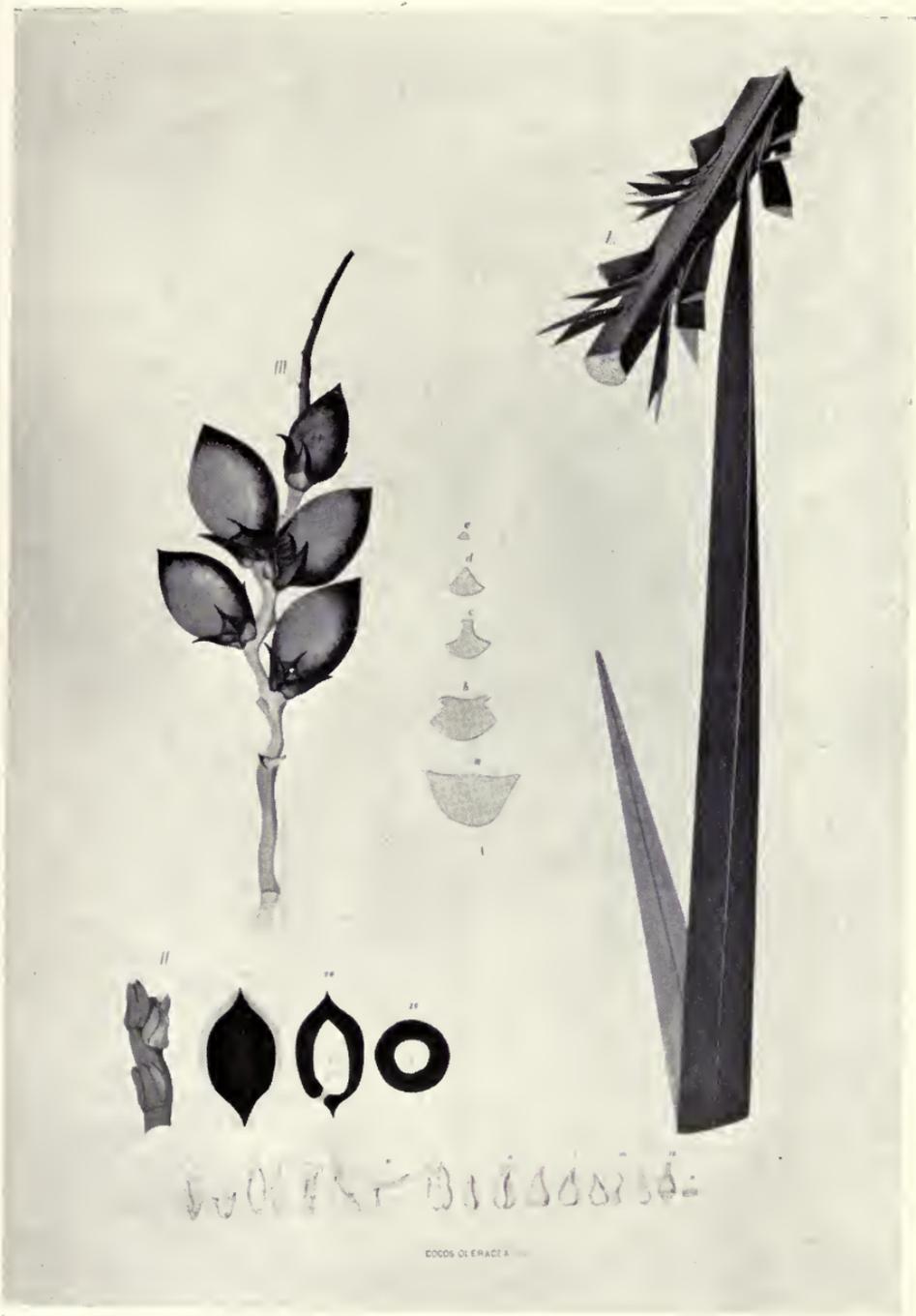


FIG. 2. *Cocos oleracea*. After Barbosa Rodrigues, 1903, t. 84.



FIG. 3. *Cocos picrophylla*. After Barbosa Rodrigues, 1903, t. 66.

*Syagrus oleracea* (Mart.) Becc., L'Agrie. Colon. 10: 467. 1916. *Cocos oleracea* Mart., Hist. Nat. Palm. 2: 117, t. 82. 1826. *C. oleracea* var. *platyphylla* Drude in Mart. Fl. Bras. 2: 417. 1881. *S. oleracea* var. *platyphylla* (Drude) Becc., L'Agrie. Colon. 10: 467. 1916. *S. picrophylla* Barb. Rodr., Prot. App. 45. 1879. *C. picrophylla* (Barb. Rodr.) Barb. Rodr., Les Palm. 26, t. 3, fig. 2a, b. 1882; Sert. Palm. Bras. 1: t. 65A-66. 1903.

Palm 10-20 m. tall—fide Drude (18-24 m.—fide Martius), trunk up to 30 cm. or more in diameter. Naked petiole 4-17 cm. long, sheathing base 45-95 cm. long, deteriorating into separate fibers; rachis of leaf 175-263 cm. long, pinnae 134-152 pairs, mostly in clusters of 3-4 (2-5), slightly glaucous or eglaucous on both surfaces, middle ones up to 80 (88) cm. long and 2.7-4.0 (4.5) cm. wide, mostly with acuminate tips; expanded part of spathe 54-100 cm. long and 9-14 cm. wide; branched part of spadix 40-68 cm. long, branches up to 50 or more in number, each branch up to 45 cm. or more long; male flowers 10-14 mm. long on upper part, 15-22 mm. long on lower part; female flowers 12-22 mm. long, 6-10 mm. wide; mature fruit ovoid, 4.0-5.2 (5.5) cm. long and 2.5-3 (3.5) cm. in diameter, with beak up to 7 mm. long, endocarp 5-8 mm. thick along sides, 7-13 mm. thick at ends, cavity mostly smooth; seed 2.0-2.5 cm. long, 1.3-1.5 cm. in diameter, cavity about 1.0 cm. long, 0.8 cm. wide.

In 1881, Drude described var. *platyphylla* as having a shorter trunk, wider pinnae and longer male flowers than var. *oleracea*. The holotype and isotypes of var. *platyphylla* (*Glaziou* 8063, C; A, NY, P, US) have pinnae up to 3.6 cm. wide, male flowers up to 16 mm. long, and female flowers 12-16 mm. long, all of which fall within the range of var. *oleracea*. Paratypes of var. *platyphylla* (*Glaziou* 7000, C, P; 8049, C, FI, K, P; 9010, A, C, FI, K, LE, NY, P, R, S) also resemble other specimens of var. *oleracea* closely. It is interesting to note that female flowers of different specimens of *Glaziou* 9010 measure 12-14, 13-15, 14-16, and 15-18 mm. long.

The description of *S. picrophylla* by Barbosa Rodrigues (1903) is very brief, e.g., width of pinnae and size of female flowers are not mentioned, and no type specimens are cited nor could any be found. An illustration (fig. 3) of diagnostic parts published at a later date by Barbosa Rodrigues (1903, t. 66), however, seems to be a close match for specimens of *S. oleracea*.

According to Beccari (1886), t. 82 of Martius (1826) consists of two different species. *Figure II* (part of spadix with individual flowers) corresponds to *Glaziou* 12255 and is *Cocos oleracea* which has long female flowers (20 mm. more or less) and wide pinnae (40-43 mm.); and *fig. III* (upper third of leaf blade with tip removed) corresponds to *Glaziou* 9010 and is *C. picrophylla* which has short female



FIG. 4. *Syagrus gomesii* Glassman. Whole inflorescence of holotype. *Glassman & Gomes 8005* (CHI).



PLANTS OF BRASIL  
 Coll. No. 8005 *Syagrus gomesii*  
 Name *Syagrus gomesii* Glassman  
 locality & habitat Est. São Paulo, 7 km.  
 N. of Iacais, fazenda Soutera,  
 comp. of Sr. Maria A. Baston. In  
 formation of dr. 500 palm tree,  
 tree about 10 ft. tall, 10 cm. dia.  
 Date July 4, 1966  
 Collector G. F. Glassman & J. L. Gomez Jr.

FIG. 5. *Syagrus gomesii* Glassman. Part of leaf of holotype. Glassman & Gomes 8005 (CHI).



FIG. 6. *Syagrus gomesii*. Female (left) and male flowers.

flowers (12 mm. more or less) and narrow pinnae (26–30 mm.). It is difficult to tell accurately the size of flowers or width of pinnae from an illustration. Furthermore, the pinnae from the upper section of the blade are mostly narrower than those from the middle section. Variation of the flower size of *Glaziou 9010* already has been mentioned, and its pinnae are 28–35 mm. wide. Specimens of *Glaziou 12255* (C, K, LE, P) which I saw have female flowers 13–18 mm. long and pinnae 38–44 mm. wide.

In 1939, Bondar considered *Cocos picrophylla* to be synonymous with *C. botryophora* Martius, but in a later article (1964) he treated them as separate species. In 1964, Bondar also treated *C. picrophylla* and *C. oleracea* as distinct taxa. He gave the distribution of *C. picrophylla* as suburbs of Vitoria, state of Espirito Santo, and that of *C. oleracea* as a triangular area bordering on the states of Minas Gerais and Goyaz. Specimens collected from Vitoria (*Bondar 15, F*) have female flowers measuring 12–13 mm. and 15–18 mm. long, and pinnae 35–40 mm. wide.

Other collections showing variation are *Glaziou 13295* (C, F, FI, P) with female flowers 16–18 and 17–22 mm. long, and pinnae 34–40 mm. wide; and *Glassman & Gomes 8001* (CHI) with female flowers

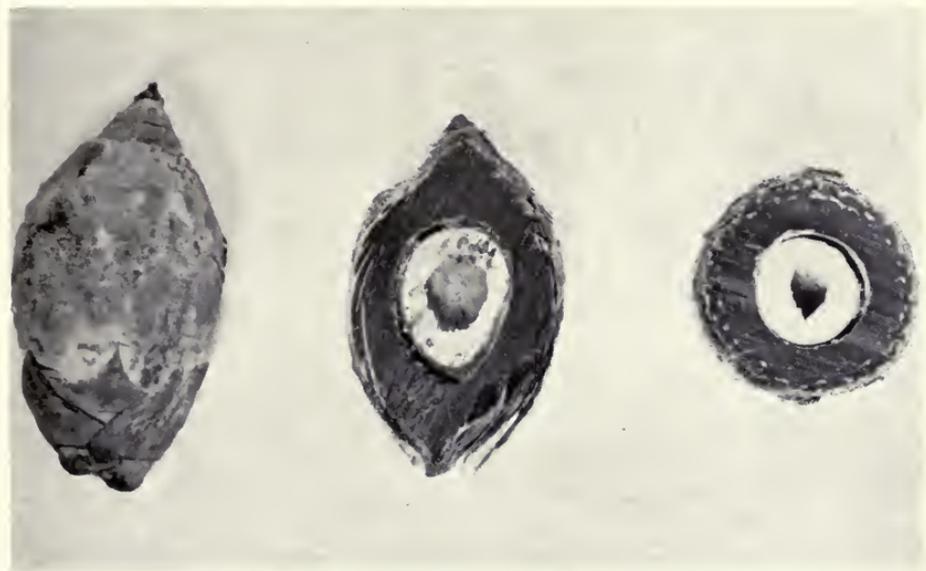


FIG. 7. *Syagrus gomesii*. External view of fruit with longitudinal and cross-sections.

17–19 and 20–22 mm. long, and pinnae up to 30 mm. wide. It is evident that two distinct taxa cannot be differentiated on the basis of flower length and pinnae width alone. Unfortunately, other diagnostic features such as rachis length, number of pinnae per leaf, length of middle pinnae, and size and morphology of mature fruit, cannot be determined from most herbarium specimens studied.

*Syagrus oleracea* is found mainly in eastern Brazil including the states of Paraná, São Paulo, Guanabara (Rio de Janeiro), Espírito Santo, Minas Gerais, Goyaz, Bahia, Pernambuco, Parahyba, and Ceará. Specimens of *S. oleracea* also have been seen from Paraguay (*Hassler 1233*, G). In São Paulo, this species is particularly abundant near Marília, Pompeia, and Tupã, where it forms stands of 200–3,000 trees along with *Syagrus romanzoffiana* (Cham.) Glassman and other species of *Syagrus*. In the field, one of these taxa is readily distinguished from both *S. oleracea* and *S. romanzoffiana* by its much taller and narrower trunk and much shorter leaves. A search of the literature fails to reveal any definite record of this palm; therefore, I am describing it as a new species:



FIG. 8. *Syagrus gomesii*. Tall, thin tree (left center) in stand with *S. romanzoffiana* and *S. oleracea*. São Paulo, 3 km. north of Pompeia.

***Syagrus gomesii* Glassman sp. nov. Figures 4-8.**

Palma 36 m. alta. Folia ca. 160 cm. longa; rachis ca. 120 cm. longis pinnae utrinque 100 in gregibus dispositus pinnis ca. 42 cm. longis 2.4 cm. latis; spatha pars inflata 46 cm. longa 9 cm. lata; spadix pars ramosa 33 cm. longa rami numerosi 21 cm. longi; flores masculi 10-11 mm. et 13-16 mm. longi; flores feminei 15-18 mm. longi 6-7 mm. lati; fructus ovoideus 5 cm. longus, 2.7 cm. diam.; semen 1.8 cm. longum, 1.2-1.3 cm. diam.

Palm up to 36 m. tall, trunk about 15 cm. in diameter. Naked petiole up to 4 cm. long, sheathing base up to 36 cm. long, deteriorating into separate fibers; rachis of leaf up to 120 cm. long, up to 100 pairs of pinnae, in clusters of 2-4, glaucous on upper surface, middle ones up to 42 cm. long and 2.4 cm. wide, mostly with acuminate tips; expanded part of spathe up to 46 cm. long and 9 cm. wide; branched part of spadix up to 33 cm. long, branches numerous, each branch up to 21 cm. long; male flowers 10-11 mm. long on upper part, 13-16 mm. long on lower part; female flowers 15-18 mm. long, 6-7 mm. wide; fruit ovoid, up to 5 cm. long and 2.7 cm. in diameter, with beak up to 5 mm. long, endocarp 5-6 mm. thick along sides, 9 mm. thick at ends, cavity mostly smooth; seed 1.8 cm. long, 1.2-1.3 cm. in diameter, cavity 1.0 cm. long, 0.8 cm. wide.

BRAZIL: State of São Paulo, 3 km. north of Pompeia, Hacienda Gueivira, property of Dr. Mario Bastos, in formation of about 3,000 palm trees, associated with *S. oleracea* and *S. romanzoffiana*, July 4, 1965, *Glassman & Gomes 8005* (CHI).



FIG. 9. *Cocos oleracea*. After Barbosa Rodrigues, 1903, *t.* 83.

I am dedicating this new species to Mr. J. C. Gomes, who was killed in an auto accident in Brazil during one of our collecting trips. See Glassman (1967) for further details.

*Syagrus gomesii* is one of the tallest, if not the tallest, known species of *Syagrus*. Apparently, the same tall, narrow-trunked tree was seen by us as scattered individuals between Belo Horizonte and Ouro Preto, Minas Gerais. An illustration of a tall tree labelled *Cocos oleracea* by Barbosa Rodrigues (1903, *t.* 83) may be the species described above, but the leaves appear to be too long (fig. 9). The



PLANTS OF Brazil  
 No. 8008 CHI  
 Name Syagrus x teixeiriana Glassman  
 Location & Habitat Est. São Paulo, W. av. N.  
of Dard, Yapaná Yapaná. Trees with  
charred trunks, not used for pasture.  
Part of stand of 1,000 trees, tree 1  
ft. tall. In campesinato of S. Paulo.  
 Date July 9, 1958  
 Collector S. P. Glassman & A. S. Gomes CHI

FIG. 10. *Syagrus x teixeiriana* Glassman. Part of inflorescence of holotype. Glassman & Gomes 8008 (CHI).



PLANTS OF BRAZIL

Coll. No. 8008

Name *Syagrus x teixeiriana* Glassman

Locality & Habitat: Sert. Sao Paulo, 20 km. N. of Tupa, Fazenda Vunir. Trees with charred trunks, land used for pasture. Part of stem of 1,500 trees, tree 11 ft. tall. *S. romancoffiana* & *S. oleracea*.

Date July 5, 1965

Collector S. P. Glassman & J. Gomes Jr.

FIG. 11. *Syagrus x teixeiriana* Glassman. Part of infructescence of holotype. Glassman & Gomes 8008 (CHI).



FIG. 12. *Syagrus x teixeiriana* Glassman. Part of leaf of holotype. Glassman & Gomes 8008 (CHI).

new species most closely resembles *S. oleracea* in the clustering of the pinnae, the size of the male and female flowers, and the size and shape of the fruit. Differences in the two species are shown in the following key:



FIG. 13. *Syagrus x teixeiriana*. Longitudinal and cross-sections of fruit.

Tree up to 36 m. tall, trunk up to 15 cm. in diameter, leaf rachis up to 120 cm. long, pinnae up to 100 pairs, each up to 42 cm. long.....*S. gomesii*  
 Tree usually 10–20 m. tall, trunk up to 30 cm. or more in diameter, leaf rachis 175–263 cm. long, pinnae 134–152 pairs, each up to 80 cm. long.....*S. oleracea*

In another stand of *S. oleracea* and *S. romanzoffiana*, we found a tree which appeared to be a hybrid between the two species. I am naming this taxon after Dr. Alcides Teixeira, Director of the Instituto de Botânica, São Paulo, to whom I am deeply grateful for greatly facilitating my collecting of palms in Brazil.<sup>1</sup>

### *Syagrus x teixeiriana* Glassman, hybr. nov. Figures 10–15.

Palma hybrida ca. 4.1 m. alta; folia ca. 269 cm. longa, rachis ca. 210 m. longis pinnae utrinque 149 in gregibus dispositus pinnis ca. 66 cm. longis 2.7 cm. latis; spatha pars inflata 82 cm. longa 13 cm. lata; spadix pars ramosa 56 cm. longa

<sup>1</sup> After reading my writeup of this species, Dr. Wessels Boer of Utrecht (personal communication) suggested that *S. gomesii* may be merely an advanced growth stage of *S. oleracea*. He has seen similar situations in other genera of palms in Surinam and Venezuela where the oldest trees of a particular stand had much taller and narrower trunks and much shorter leaves than the normal population of that species. It will be interesting to explore this theory further on my next trip to Brazil.



FIG. 14. *Syagrus x teixeiriana*. Tree showing inflorescences and infructescences. São Paulo, 20 km. north of Tupã.



FIG. 15. *Syagrus x teixeiriana*. J. C. Gomes holding infructescence and inflorescence. Leaves on ground. Same locality as Figure 14.

rachilliis ca. 38, 41 cm. longis; flores masculi 8–12 mm. et 15–17 mm. longi; flores feminei 7.0–7.5 cm. longi 5–7 mm. lati; fructus ovoideus 3 cm. longus 2 cm. diam.; semen 1.3–1.4 cm. longum, 0.7 cm. diam.

Hybrid palm about 4.1 m. tall, trunk about 15 cm. in diameter. Naked petiole up to 6 cm. long, sheathing base up to 53 cm. long, deteriorating into separate fibers; rachis of leaf up to 210 cm. long, up to 149 pairs of pinnae, mostly in clusters of 4 (3–5), slightly glaucous on both surfaces, middle ones up to 66 cm. long and 2.7 cm. wide, mostly with long acuminate tips; expanded part of spathe up to 82 cm. long and 13 cm. wide; branched part of spadix up to 56 cm. long (fruiting—up to 81 cm. long), branches about 38 in number, each branch up to 41 cm. long (fruiting—86 branches, each up to 48 cm. long); male flowers 8–12 mm. long on upper part, 15–17 mm. long on lower part; female flowers 7–7.5 cm. long, 5–7 mm. wide; fruit ovoid, up to 3 cm. long and 2 cm. in diameter, with very short beak, endocarp 4–4.5 mm. thick along sides, up to 7 mm. thick at ends, cavity smooth inside, but slightly irregular in shape; seed (only one seen) inseparable from endocarp cavity, 1.3–1.4 cm. long, 0.7 cm. in diameter, cavity 7 mm. long, 2 mm. wide.



FIG. 16. *Syagrus romanzoffiana*. Tree showing inflorescence. São Paulo, 18 km. east of Marília.



FIG. 17. *Syagrus romanzoffiana*. J. C. Gomes holding leaf. Locality same as Figure 16.



FIG. 18. *Syagrus romanzoffiana*. J. C. Gomes holding inflorescence and infructescences. Locality same as Figure 16.

BRAZIL: State of São Paulo, 20 km. north of Tupã, Fazenda Vanuir, part of stand of about 1,000 palm trees, associated with *S. oleracea* and *S. romanzoffiana*, July 5, 1965, Glassman & Gomes 8008 (CHI).

Collections were made from only one tree of this taxon. There were probably other hybrid trees, but due to lack of time no others were found. The following table shows relationships between the hybrid and its two putative parent species. Since only one specimen of *S. x teixeiriana* was collected, measurements for the parent species are based mainly on specimens collected in the same stand rather than on extreme measurements.

	<i>S. romanzoffiana</i>	<i>S. x teixeiriana</i>	<i>S. oleracea</i>
Rachis length	Up to 207 cm.	Up to 210 cm.	Up to 175 cm.
No. of pinnae per leaf	Up to 147 pairs	Up to 149 pairs	Up to 134 pairs
Middle pinnae width	Up to 2 cm.	Up to 2.7 cm.	Up to 2.8 cm.
Middle pinnae length	Up to 65 cm.	Up to 66 cm.	Up to 62 cm.
Spadix			
Branched part	Up to 83 cm. long	Up to 56 cm. long	Up to 45 cm. long
No. of branches	Up to 77	Up to 38	Up to 40
Length of each branch	Up to 62 cm.	Up to 41 cm.	Up to 27 cm.
Length and width of female flowers	4.5-5.5×4-5 mm.	7.0-7.5×5-7 mm.	18-22×8-9 mm.
Fruit length and diameter	2.0-2.2×1.4-1.5 cm.	3×2 cm.	4.0×2.5 cm.
Beak	Very short	Very short	About 5 mm. long
Endocarp cavity	Very irregular in outline, grooved within	Slightly irregular in outline, slightly grooved within	Regular in outline, smooth within
Seed length and diameter	0.8×0.6 cm.	1.3-1.4×0.7 cm.	2.0×1.3 cm.
Seed shape and position	Gibbous-uncinate, inseparable from fruit	Narrowly ovate, inseparable from fruit	Ovate, readily separable from fruit
Seed cavity	Very small or none	Large and narrow	Large and rounded

Analysis of the above chart shows that *S. x teixeiriana* is similar to *S. romanzoffiana* (figs. 16-18) in the rachis length, the number of pinnae per leaf, the short beaked fruit, and seed being inseparable from the fruit; and it resembles *S. oleracea* (fig. 19) in the width of the middle pinnae, the number of spadix branches, the seed shape, and the large seed cavity. The hybrid is more or less intermediate between the two species in the length of the branched part of the spadix and the individual spadix branches, the width of the female flowers, the length and diameter of the fruit, the shape of the endocarp cavity, and the length of the seed. In addition to this, the length of the middle pinnae of all three taxa is about equal and the female flowers in *S. x teixeiriana* are about 2 mm. longer than those of *S. romanzoffiana*.



FIG. 19. *Syagrus oleracea*. J. C. Gomes holding inflorescence and infructescence. Leaves on ground. Locality same as Figure 16.

## REFERENCES

- BARBOSA RODRIGUES, J.  
1903. Sert. Palm. Bras. 1: t. 83-84.
- BECCARI, O.  
1886. Le Palme incluse nel genera Cocos Linn. Malpighia 1: 448.
- BONDAR, G.  
1939. Palmeiras da Bahia. Inst. Centr. Fom. Econ. Bahia Bol. 6: 9-10  
1964. Palmeiras do Brasil. 80, 84. São Paulo.
- GLASSMAN, S.  
1967. Collecting palms in Brazil. Principes 11: 41-52, figs. 1-12.

















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