

# The Grassy *Butia*: Two New Species and a New Combination

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1. *Butia exospadix* with its grass-like habit.

Two palms that imitate grass have been discovered in the natural grasslands on the border of Paraguay and Brazil. These new, illusive, grass-like species, *Butia exospadix* and *B. marmorii*, show distinctive similarities to the rarely collected *Syagrus leptospatha*, which is transferred to the same complex of *Butia* species.

*Butia* contains nine species (Govaerts & Dransfield 2005) occurring in Brazil, Paraguay, Uruguay and Argentina. Some of the members of the genus that are found in Paraguay and Brazil are among the smallest of palms. I refer to these smaller members as the grassy *Butia* because they blend in so perfectly with the grasses of the savanna (cerrado) that they are rarely noticed (Fig. 1). Species in this group have leaf petiole margins lined with fine fibers rather than the typical petiole spines found in most *Butia* species.

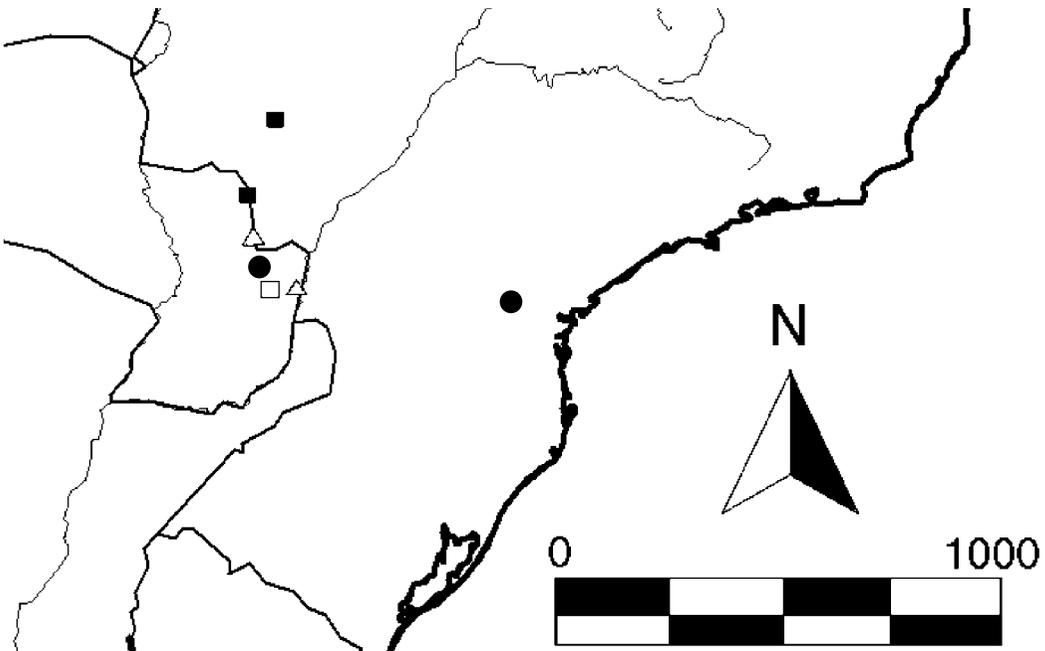
Some of these smaller *Butia* species have been mistakenly placed in the genus *Syagrus*. Recently, *Butia campicola* was transferred from *Syagrus* (Noblick 2004).

In this paper, I transfer *Syagrus leptospatha* Burret to *Butia* and also describe two new species, *Butia exospadix* Noblick and *Butia marmorii* Noblick. Several of these species roughly follow a curious distribution beginning in the north in the center of Brazil's Mato Grosso do Sul in the Serra de Maracaju (*B. leptospatha*), extending south following the Paraguayan-Brazilian border along the Sierra de Amambay (*B. leptospatha*, *B. exospadix*) and finally turning east into the Sierra de Mbaracayú (*B. campicola*). Many are within the drainage of the Rio Parana (*B. exospadix*, *B. marmorii*, *B. microspadix*) (Fig. 2).

**Key to the Grassy *Butia***

1. Inflorescence branched, rarely spicate . . . 2.
1. Inflorescence spicate, rarely branched . . . 3.
2. Inflorescence usually with 1–8 branches, peduncular bract opaque papery to thicker and glabrous to lepidote . . . . . *B. marmorii*
2. Inflorescence usually with 12–17 branches, peduncular bract much thicker, covered with a thick wooly tomentum . . . . . *B. microspadix*
3. Leaf rachis less than 12 cm long (as measured between the basal and apical leaflet insertions, ca. 3–10 cm long), leaflets crowded together on the rachis, pistillate flowers less than 4 mm long (ca. 3.0–3.5) . . . . . *B. exospadix*
3. Leaf rachis greater than 18 cm long, ca. 18–77 cm, leaflets regularly spaced with up to 1–3 cm between the leaflets, pistillate flowers greater than 4.5 mm long (4.5–7.0 mm) long . . . . . 4.
4. Peduncular bract 9–15 cm long, extremely thin, papery, like translucent onion skin, spike only to 4 cm long . . . . . *B. leptospatha*
4. Peduncular bract 40–73 cm long, thicker, coriaceous, opaque, spike greater than 10 cm long (12–21 cm) . . . . . *B. campicola*

2. Map of Paraguay and Southern Brazil showing the distribution of *Butia leptospatha* (square), *Butia exospadix* (open triangle), *Butia campicola* (circle), *Butia marmorii* (open square) and *Butia microspadix* (pentagon). Scale is kilometers.



***Butia leptospatha*** (Burret) Noblick **comb. nov.** Fig. 3.

*Syagrus leptospatha* Burret, Notizbl. Bot. Gart. Berlin Dahlem 15:105. 1940. Type: Brazil, Mato Grosso, Boliche Seco, Campo Grande, Archer & Gehrt 3915 (Holotype: SP-36429, isotype: US).

*Syagrus leptospatha* was discovered in 1936, described by Burret (1940) and not recollected again until 58 years later in 1994 (Pedro Juan Caballero, Paraguay). Glassman (1987) wrote that it was "probably extinct." Today, its former habitat is dominated and threatened by soybean cultivation. Phylogenetic character analyses of the Attaleinae show that *Syagrus leptospatha* aligns closely with *Butia* species (Noblick unpublished), rather than with other *Syagrus*. *Butia leptospatha* (Fig. 2) differs from *Syagrus* by having no noticeable deep grooves in its onion skin-like, paper-thin bracts. Its leaf anatomy as illustrated in Glassman (1987) shows vascular bundles on both the adaxial and abaxial surface as in other *Butia* (*Syagrus* species have vascular bundles only on the abaxial surface). *Butia leptospatha*, *B. campicola* (Barb. Rodr.) Noblick and *B. exospadix* have dark purple fruit, are acaulescent, have spicate inflorescences, have long peduncles that (usually) project the inflorescence in fruit above the peduncular bract (sometimes

substantially so) and have the narrow grass-like leaflets. Based on its smooth peduncular bracts, its leaf anatomy, the phylogenetic analyses and its similarity to two other *Butia* species, I am here in transferring *Syagrus leptospatha* to *Butia*.

Guillermo Marmorì has discovered two new species of *Butia* in Paraguay. The first was collected in 1980, and the site is now under water. The second was discovered in 1993 from a region just west of the Itaipu reservoir. The 1980 discovery is *Butia exospadix*, and the 1993 discovery is *Butia marmorii*.

***Butia exospadix*** Noblick **sp. nov.**, palma graminiformis, solitaria trunco acaule et subterreano; folium reduplicato-pinnatum foliolis 6–10, congestis, rhachide foliorum 3–10 cm longa; spica super spatham exerta. Typus: Paraguay, Canindeyú, Itanana, L.R. Noblick & T. Rios Otero 5305 (Holotypus: PY; isotypi: FCQ, FTG, K, NY). Fig 4.

Stem solitary, acaulescent, subterranean 10–20 cm in diam. Leaves 2–7 in the crown, spirally arranged and spreading; leaf sheath plus petiole ca. 6–11 cm long, adaxially channeled and abaxially rounded, and glabrous; petiole without the leaf sheath 0–3 cm long and 0.3–0.5 cm wide and 0.2 cm thick at the base

3. Herbarium specimen of *Butia leptospatha* showing its spicate inflorescence and its very short, onion-skin thin peduncular bract (Archer & Gehrt 3915).



of the leaf blade; leaf rachis 3–10 cm long with 6–10 pairs of leaflets distributed evenly along the rachis closely crowded together in a congested manner; basal leaflets ca. 32–42 cm long  $\times$  0.1–0.2 cm wide, middle leaflets ca. 30–48 cm long  $\times$  0.3–0.4 cm wide, apical leaflets ca. 32–45 cm long  $\times$  0.1–0.2 cm wide. Inflorescence interfoliar, unbranched, 4.5–12 cm long with peduncle glabrous, 36–67 cm long  $\times$  0.15–0.2 cm diam.; peduncular bract 33–46 cm long with no apparent beak and the expanded or inflated part of the bract 5.5–16 cm long  $\times$  0.5–1 cm in width and with a 1.2–2.3 cm perimeter and a 0.5–1 mm thickness, tightly enveloping the peduncle; rachilla 1, ca. 4.5–12 cm long; pistillate (triad) flowering portion 1.5–2.5 cm long, number of pistillate flowers 9–17 and the staminate flowering portion measuring 4–6 cm long. Flowers pale yellow to purple tinged, staminate flowers near the base of the inflorescence 3.5–4.0 mm long, sessile; sepals 3, distinct, linear, imbricate but briefly connate at base, acute to mucronate, membranous, glabrous; petals 3 distinct, unequal, obovate, valvate, fleshy, glabrous, with inconspicuous venation, ca. 3.5–4.0  $\times$  2 mm, acute tips; stamens 6, pale yellow, distinct, 2.2–2.8 mm long, with filaments 1–2 mm long; pistillode trifid, not reflexed, less than 0.5 mm long. Pistillate flowers, globose to ovoid, sessile 3.5–4.0  $\times$  2.5–3.5 mm; sepals, glabrous, without visible venation 3–3.5  $\times$  2.5–3.2 mm, coriaceous, imbricate, sepals subequal, acute, keeled to faintly keeled at tip; petals 3, distinct, imbricate at base, valvate at apex, triangular, faintly nerved, especially near the base, glabrous, 2.5–3.5  $\times$  2–3 mm, valvate portion 0.5–1.5 mm long, acute; gynoecium 2–2.7  $\times$  1.5 mm. glabrous, stigma 0.5–0.8 mm long, and staminodes 0.6–0.7 mm long, 3–6 dentate to smooth and truncate. Fruits purple when mature, 1.2–2.0  $\times$  1.2–1.5 cm, ovoid; cupule (persistent perianth) reddish brown, 0.8–1.0 cm in diam.  $\times$  ca. 0.3–0.4 cm high; petals longer than sepals, staminodial ring truncate, 1 mm high  $\times$  3–4 mm diam.; epicarp, dark purple when mature, smooth and glabrous; mesocarp pale yellowish, fleshy, non-fibrous ca. 1–2 mm thick; endocarp nearly spherical, ca. 1.0–1.6  $\times$  1.0–1.3 cm, 1 mm or less thick, hard, bony, dark brown to nearly black, apex with no distinctive protuberance or beak, interior smooth, monovittate, round in cross-section, outer surface nearly smooth, pores 3 nearly even with surface and subequatorial, sutures visible especially at apex; seed 1, spherical to ellipsoidal, ca. 0.8–1.2  $\times$  ca. 1 cm,

endosperm white, homogeneous. Germination remote tubular, eophyll simple, narrowly lanceolate.

**Common name:** *jataí poñy*.

**Habitat and conservation:** Open grasslands and savannas (cerrados); flat terrain with deep sandy soils and with few, and sparsely distributed shrubs and trees, frequently associated with *Allagoptera campestris*. The plants are restricted to the open short grasses rather than in the adjacent low weedy scrub.

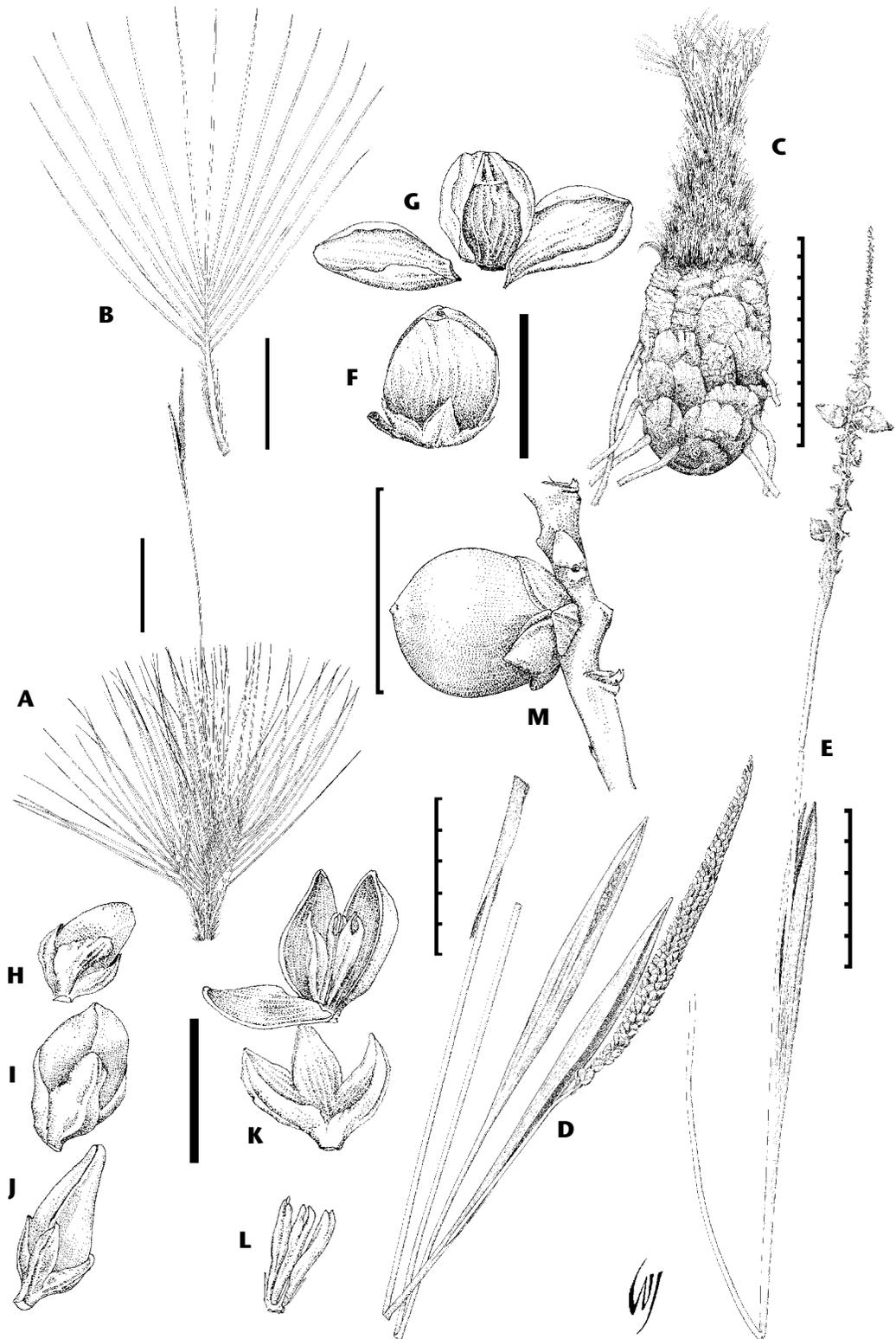
**Etymology:** The specific epithet is from *exo*-meaning “outside” and *spadix* referring to an “inflorescence (of palm).” Together they are translated as “outside inflorescence” or “projecting inflorescence,” referring to the elongated peduncle (in fruit) that projects the inflorescence far above and “outside” of the peduncular bract. It is not the only *Butia* to do this, but it is the one that does it in the most exaggerated manner.

**Distribution:** Known from the Paraguay–Brazil border in Canindeyú, Paraguay between Ypé Jhu (Paranhos, Brazil) and Capitán Bado (Colonel Sapucala, Brazil) just north of Itanana, and also from Alto Parana, an area now flooded by the Itaipu Reservoir.

**Phenology:** Most of palms had flowers or developing immature fruit with only one with mature fruit in February.

**Specimens Examined:** PARAGUAY: Canindeyú, Itanana, 19 km N of Itanara on Ypé Jhu/Capitán Bado Road, ca. 422 m, 23° 37.958'S, 55° 32.210'W, 8 Dec 2002, *L.R. Noblick & T. Rios Otero 5305* (Holotype PY; isotypes FCQ, FTG, K, NY); 26–27 km N of Itanara on Ypé Jhu /Capitán Bado Road, ca. 420 m, 23° 34.411'S, 55° 31.875'W, 8 Dec 2002, *L.R. Noblick & T. Rios Otero 5307* (FCQ, FTG, K, US); 20 km circa ante Capitan Bado ex Ype-Jhu, 12 Jan 1979, *L. Bernardi 19568* (NY); Alto Parana, Agricola Itabo, 70 km NE de Hernandarias, inundado por lago de Itaipu, zona del Rio Itabó, 12 Apr 1980, *G. Marmorì 687* (CTES); San Pedro, Yaguareté Forest (Sustainable Forest Systems site), around Aserradera. 23° 47' 46" S 56° 12' 41" W, 21 May 1997, *E. Zardini & S. Zavala 46879* (FTG, MO).

**Discussion:** *Butia exospadix* is easily separated from *B. leptospatha* by its shorter leaf rachis (3–10 cm vs. 35–37 cm), longer peduncular bract (48–73 cm vs. 9–13 cm), smaller pistillate flowers (less than 4 mm vs. 7–8 mm) and longer spike (12–21 cm vs. 3–4 cm). *Butia*



4. *Butia exospadix*. A Habit; B Leaf, showing the short rachis; C Underground stem; D Inflorescence; E Infructescence; F-G Pistillate (female) flower; H-L Staminate (male) flowers and one open male flower with sepals and three stamens removed; M Fruit. Habit, stem and fruit drawn from photographs; leaf, flowers, inflorescences and infructescences drawn from Noblick & Rios 5305. Thin line scale is 10 cm (A-B), thick line scale on flowers is 5 mm (F-G and H-L). All other scales are in cm as marked. Drawn by Wes Jergens.



5 (upper left). *Butia exospadix* inflorescence with small crowded flowers (Noblick 5305). 6 (upper right). *Butia campicola* inflorescence with larger and fewer flowers (Noblick 5299). 7 (lower left). *Butia exospadix* infructescence with a mature, beakless, purple fruit (Noblick 5307). 8 (lower right). *Butia campicola* infructescence with immature, beaked fruit (Noblick 5299).



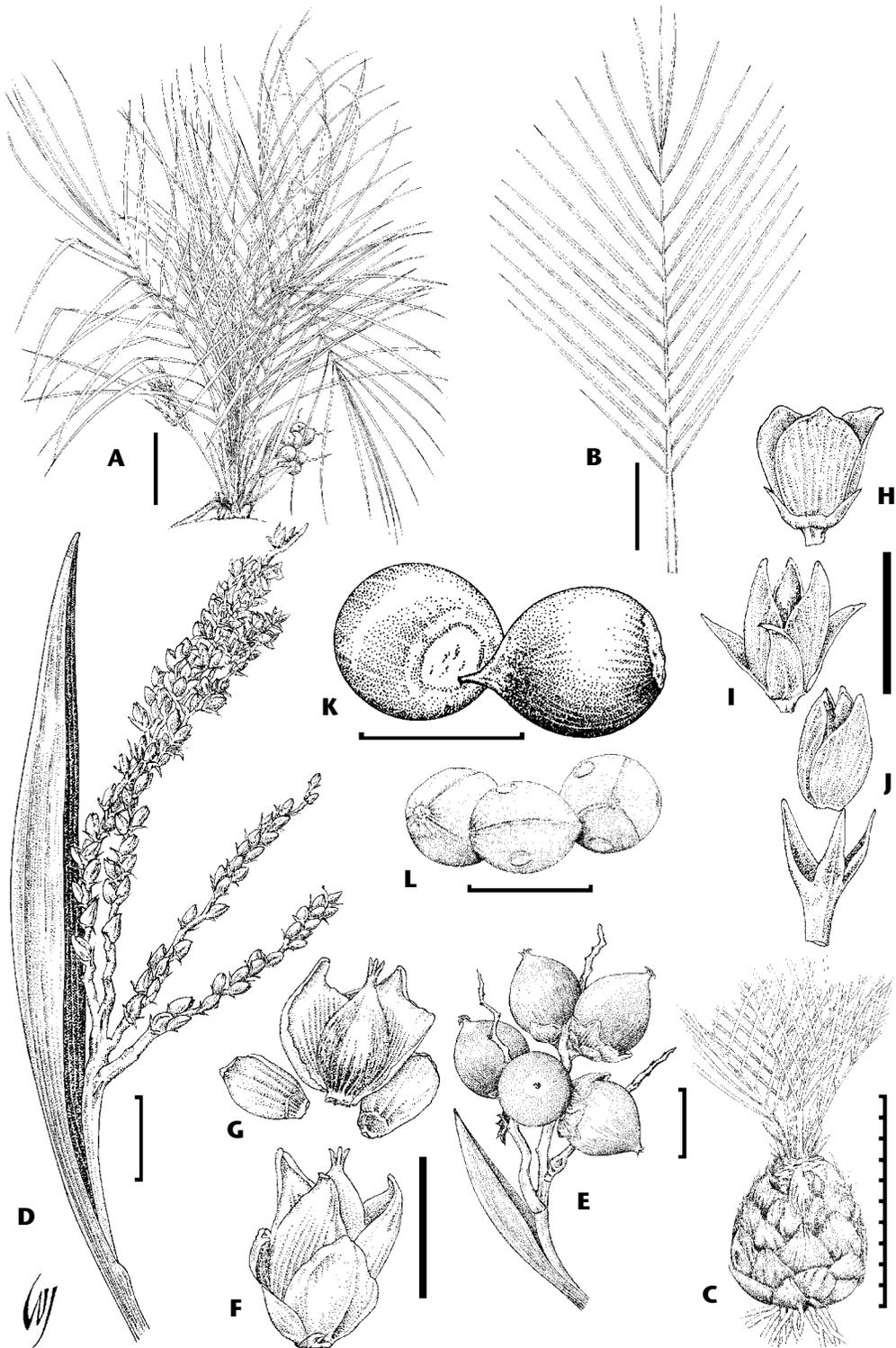
9. *Butia exospadix* leaf rachis showing congested leaflets on a short rachis (Noblick 5305).

*exospadix* is separated from *B. campicola* by its smaller inflorescence (6.0–7.5 cm vs. 12–21 cm), smaller and more crowded flowers (Figs. 5 & 6) and by the smaller, usually non-beaked fruit (Figs. 7 & 8). *Butia exospadix* is vegetatively separated by its congested leaf rachis (Fig. 9).

***Butia marmorii* Noblick sp. nov.**, palma solitaria trunco acaulis et subterreano. Folium reduplicato-pinnatum foliolis 9–18, regulariter dispositis. Inflorescentia ad 7–17 cm longa, rachillis (1) 2–4, floribus femineis ca. 5.0–6.5 × 2.5–3.0 mm. Typus: Paraguay, Alto Parana, Cia. Laguna. L.R. Noblick et al. 5122 (Holotypus PY; isotypes FTG, K, NY) Figs. 10 & 11.

Stem solitary acaulescent, subterranean 10–20 cm in diam. with persistent leaf bases (Fig. 12). Leaves 3–5 in the crown, spirally arranged and

spreading; leaf sheath plus petiole ca. 2–15 cm long, adaxially channeled and abaxially rounded, and glabrous; petiole not including the leaf sheath less than 1 cm (0.4–0.5) cm long and 0.5–0.7 wide and 0.1–0.2 cm thick at the base of the leaf blade; leaf rachis 23–51 cm long with ca. 9–18 pairs of leaflets distributed evenly along the rachis; basal leaflets ca. 11–31 cm long × 0.1–0.3 cm wide, middle leaflets ca. 24–44 cm long × 0.4–0.7 cm wide, apical leaflets ca. 17–31 cm long × 0.1–0.3 cm wide. Inflorescence interfoliar, unbranched or branched to 1 order, peduncle 4.5–9.0 cm long × 0.3–0.5 cm wide × 0.1–0.5 cm thick; peduncular bract with a total length of ca. 8–19(–40) cm with no apparent beak and the expanded or inflated part of the bract measuring ca. 4.0–12.5(–18) cm long × 0.3–1.1



10. *Butia marmorii*. A Habit; B Leaf; C Underground stem; D Inflorescence; E Infructescence; F & G Pistillate (female) flower; H-J Staminate (male) showing various male flower shapes and one male flower with sepals removed; K Fruit; L Endocarp. Habit and fruits drawn from colored photos, stem drawn from prints of *Marmorii* 3138; leaf, flowers, inflorescences and infructescences drawn from *Noblick et al.* 5122. Thin line scale is 10 cm (A & B), thick line scale on flowers is 5 mm (F & G and H-J). All other scales are in cm as marked. Drawn by Wes Jergens.



11 (top). *Butia marmorii* plant in habitat among grasses. 12 (bottom). *Butia marmorii* plant dug up by road construction crews exposing the grapefruit-sized underground stem.

(–2.5) cm in width and with a 1.2–3.0 cm perimeter and a 0.5 mm thickness, very thin or thicker, but not as thin as onion skin and never translucent; rachis 0–1 cm long; rachillae

1–8, apical ones ca. 2.8–7.0 cm long and basal ones ca. 3–7 cm. Flowers dark purple to pale yellow with purplish tinge; staminate flowers near the base ca. 4.5–5.5 mm long × 2 mm

wide, sessile, basal ones frequently short pedicellate with pseudopedicels ca. 1–1.5 mm long; sepals 3, distinct, linear triangular, connate at base forming a pseudo-pedicel, acute, sclerenchymous at the base but membranous near the tip, glabrous; petals 3 distinct, unequal, obovate, valvate, membranous, glabrous, with distinct venation, ca. 3.5–3.8 × 2.0–2.5 mm, acute; stamens 6, pale yellow, distinct, 2.5 mm long, with filaments 1.5 mm long, pistillode trifid, less than 0.5 mm long. Pistillate flowers, conical, sessile; sepals, glabrous, with no visible venation except at the margins and tip, sclerenchymous, imbricate, ca. 5.0–6.5 × 2.5–3.0 mm, unequal, acute, faintly keeled at tip; petals 3, distinct, imbricate at base, valvate at apex, triangular, obscurely nerved, glabrous, 3.2–5.5 × ca. 2.3–3.0 mm, acute; gynoecium 2.5–3.0 mm long × 1.0 mm wide, glabrous. Fruits purple when mature, 1.2–2 cm long × 1.2–1.5 cm in diam., ovoid; cupule (persistent perianth) greenish brown, ca. 0.6–0.8 cm in diam. × ca. 0.4 cm high; petals slightly longer than sepals, staminodial ring truncate, 0.5 mm high × 2.5 mm diam.; epicarp dark purple when mature (Fig. 13), smooth and glabrous; mesocarp pale yellow, fleshy, non-fibrous ca. 1–2 mm thick; endocarp nearly spherical to elliptical, ca. 1.0–1.8 × ca. 1.0–1.3 cm., ca. 1 mm or less thick (ca. 0.5 mm thick), hard,

bony, dark brown to nearly black, apex with no distinctive protuberance or beak, interior smooth, monovittate, round in cross-section, outer surface nearly smooth, pores subequatorial, 3 nearly even with surface, sutures visible; seed 1, spherical to elliptical, 8–9 mm long × 5–6 mm diam., endosperm white, homogeneous. Germination remote tubular, eophyll simple, narrowly lanceolate.

**Common name:** *yatay poñy*.

**Habitat and conservation:** Cerrado scrub, in open grassy areas between the taller cerrado plants, restricted to the medium to tall grasses rather than in the adjacent low weedy scrub. Plants in full sun were more productive than those in shade. The terrain is nearly flat with gentle slopes and with a red sandy, lateritic soil. The site has been excavated for road work and threatened by pasture land. By 2004 soybean fields were encroaching on the site; the area is not expected to survive. Luckily, Marmori discovered another site within 2 km of Cia Laguna, but none of the areas is legally protected, and the palms remain threatened.

**Etymology:** The specific epithet honors its discoverer, Itaipu botanist, Guillermo Caballero Marmori.

**Distribution:** Known from a small area in Alto Parana, Paraguay in the vicinity of the village

13. *Butia marmorii* infructescence showing the purple fruit and thicker bract.



14. *Butia marmorii*  
inflorescence with purplish  
flowers and smooth, opaque,  
peduncular bract (Noblick  
5332).



of Cia Laguna. A collection from Instituto de Botánica Darwinion (SI) confirms a population of more robust plants as far south as San Ignacio, Misiones, Argentina and digital images taken in the field corroborate its presence as far north as Três Lagoas, Mato Grosso do Sul, Brazil (Emerson Salviani, pers. comm.).

**Phenology:** Palms had developing and mature fruit in February, and several were continuing to flower.

**Specimens Examined:** ARGENTINA: Misiones, San Ignacio, near the house of H. Qulroga, 27° 16'S 55° 33'W, 270 m, 9 Dec 1997, M.E. Múlgura de Romero et al. 1657 (SI); PARAGUAY: Alto Parana, before Cia Laguna and Itaquyry, ca. 69–70 km N of Hernandarias, ca. 10 km after the turn off for Itaquyry, 25° 2' 3''S 54° 59' 41.8''W, 180 m, 15 Feb 1996, L.R. Noblick, H. Cropper, T. Rios Otero, M. Quintana, & G. Marmorii 5122 (Holotype PY, isotypes FCQ, FTG, NY); Laguna, 70 km N de Hernandarias, 27 Mar 1993, G. Cabellero Marmorii 3138 (Herbarium at Itaipu, CTES, FCQ, MBM); Cñia Laguna, approx 55°W, 25°S camino a Itakiri, ca.

64 km NE de Hernandarias, 28 Mar 1993, A. Schinini, R. Vanni & S. Cáceres 28229 (CTES); 10 km NW de ruta Ciudad del E-Salto de Guairá, camino a Itaquyry, 25° 01'S 54° 59'W, 28 Oct 1994, A. Krapovickas, R.M. Harley, C.L. Cristobal, & A. Schinini 46129 (CTES, K); Cia Laguna, about 1–2 km E of Laguna along a dirt side road, ca. 276 m, 25° 0.075'S 55° 2.516'W, 26 Nov 2002, L.R. Noblick, T. Rios Otero & G. Marmorii 5281 (PY, FCQ, K, NY).

**Discussion:** *Butia marmorii* is distinct from *B. leptospatha* in having branched vs. spicate inflorescences, thicker opaque bracts vs. translucent onion skin-like bracts, smaller pistillate flowers (4.5–6.0 mm vs. 7–8 mm long) and shorter peduncles (4.5–9.0 cm vs. 8.5–24 cm long). *Butia marmorii* is easily separated from *B. microspadix* by its glabrous to lepidote vs. tomentose bracts and 2–4(–8) vs. 12–17 inflorescence branches (Figs. 14 & 15).

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15. *Butia microspadix* inflorescence from the state of Parana, Brazil with characteristic densely, hairy peduncular bract (Noblick 4881).

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