

The *Coccothrinax* "azul" from Sancti Spiritus, Cuba

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1. The natural
habitat of
Coccothrinax
spirituana.
Photo by R.
Verdecia.



A new species of *Coccothrinax* from Cuba is described and compared with similar species of the genus.

Coccothrinax is restricted to the Caribbean basin, with the greatest diversity in Cuba. Cuba has 46 taxa, comprising 38 species, seven infraspecific taxa and one hybrid recently described. Only one Cuban species is not endemic to the island.

In 1975, two different *Coccothrinax* were collected from San Felipe in Sancti Spiritus Province and planted at the National Botanic Garden (NBG) in Havana. One had green leaves and the other blue leaves (Rodríguez & Díaz 1982). They were planted in the NBG's serpentine area, known as "Cuabal," with the blue morph having the accession number 1981-00325. The blue morph is known as *Coccothrinax* "azul" and has maintained its ash-gray color, similar to ones growing in its native habitat. The *Coccothrinax* sp. "blue leaves" referred to by Moya and Mayotte in 1966 is this same species. The green-leafed species is *Coccothrinax clarensis* subsp. *clarensis* León.

In 1995, Moya and H. Rodríguez from Cienfuegos Botanical Garden and Dr. Peter Mayotte, a palm enthusiast from South Florida, visited the serpentine areas of San Felipe looking for *Coccothrinax* "azul" (Figs. 1 & 2). They collected herbarium vouchers of the *Coccothrinax* species with blue leaves, which are deposited in Sancti Spiritus Botanic Garden Herbarium (HJBSS). One month later Moya,

with the Sancti Spiritus Botanical Garden team, collected five different accession numbers of this palm and deposited them at HJBSS. This blue-leaved species showed substantial differences in leaves and leaf sheath from other *Coccothrinax* species. In subsequent visits, the population was found being badly damaged by quarrying activity, with bulldozers working intensely.

Now 20 years later, we compare this palm with other *Coccothrinax* species, looking for differences and similarities. We compare it with the original description of *Coccothrinax macroglossa* by Leon in 1939, and the subsequent description done by Muñiz and Borhidi in 1981. Our diagnosis can be seen below. Verdecia recently collected samples of the mystery palm in 2015, and we use his samples to describe a new species.

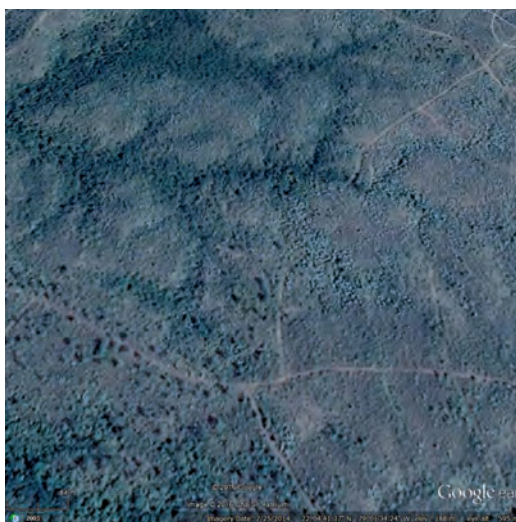
A recent visit to the area found a well-conserved population with large numbers of individuals (Fig. 3). Another population grows in the neighboring province of Ciego de Avila.

***Coccothrinax spirituana* R. Verdecia & Moya, sp. nov.**

This palm differs from other species of the genus by having leaves ash-gray on both surfaces of the blade (Figs. 1 & 2). It is related to *Coccothrinax macroglossa* but can be

2. *Coccothrinax spirituana* in its natural habitat where ash-gray leaves are conspicuous. Photo by J. García-Lahera.





3. Google Earth satellite view. The ash-gray leaves of *Coccothrinax spirituana* are visible on the right side of the image. Photo from Google Earth.

distinguished by its lower stature (3–5 rather than 8–12 m), leaf sheath longer (50–55 as opposed to 30–50 cm), with the free portion shorter (9.5–10 rather than 10–25 cm), its loosely woven strands, well developed free strand tips that are thicker and stiffer, and fewer leaf segments (34–32 rather than 40–50), smaller adaxial hastula (1.5–2 rather than 2.5–3 cm long), 2 or 3 rather than 3 or 4 primary branches in the inflorescence, the primary branches longer (32–39 cm as opposed to 10–12 cm) that are thicker (4.5–6 mm rather than 4 mm diameter), and the dark reddish–purple instead of blackish mature fruit. Type: CUBA. Provincia Sancti Spiritus, Municipio Jatibonico, San Felipe, Arroyo Blanco, 22°04'09"N 79°01'07"W, 200 m, 2 Jul. 2015, R. Verdecia with J.P. García-Lahera RV15/06 (Holotype HMC!, isotype HAC!).

Small, solitary, unarmed palm to 3–5 m tall (Fig. 4). Stems erect, 12–15 cm diameter, usually covered with a fibrous network of leaf sheaths, becoming bare in older palms. Leaves 15–20 per stem, palmate, orbicular, rigid, and undulate; leaf sheaths 50–55 cm long, lower portion 15–18 cm wide, densely woven, covered with a dense velvety tomentum, apical portion 16–21 cm wide, loosely woven, containing fiber strands that occur in two layers and run in a crisscross direction, the outer layer strands 2–3.5 mm thick, and the inside strands 1 mm thick, free leaf sheath truncate, 9.5–10 cm long, with free strands tips 2.5–3.5 cm long, 1.5–2 mm thick and attenuate (Fig. 5); petiole from leaf sheath base

to hastula 58–78 cm long, 5–7 cm wide at sheath base, 2.4–2.5 cm wide at free sheath portion and 1.8–2 cm wide at hastula base, basally slightly flattened adaxially, convex abaxially, biconvex apically, covered densely with a deciduous white tomentum at the base; adaxial hastula 1.5–2 cm long, rigid, rounded, abaxial hastula 1–1.7 cm long, acute; leaf blade with 34–42 segments, adaxially channeled, dark bluish–silver, covered densely with a deciduous layer of whitish wax, abaxially silvery, covered with dense clusters of white scale–like hairs, between them numerous brown dots, central segments 50–70 cm long, palman 10–23 cm long, free portion more than two thirds its length, 4.5–6 cm wide at its widest point at the shoulders where it abruptly narrows and then tapers gradually for 20–30 cm to the apex, apex bifid for about 2–4 cm, with slightly thickened edges; midrib light brown, impressed adaxially, prominent abaxially, secondary veins slightly wider than the tertiary veins, both impressed and visible adaxially, abaxial veins little visible being masked by the thick waxy hairs, margin thickened, dark glossy brown, when joined in the palman forming thick yellowish ribs when fresh, transverse veinlets absent. Inflorescences, shorter than the leaves, pendant, arching, 50–105 cm long, branched to 1 order, 2 or 3 primary branches 50–60 cm long, very close; peduncle and rachis of the main axis overlapped by the woody bracts; prophyll deeply buried among the sheaths, inserted 1–1.6 cm above the base of peduncle, striate, rigid, 14.5–20.0 cm long, 1.5–2.5 cm wide, two keeled covered with hairs, tubular base, overlapping peduncular bract, ventral opening distally up to 3.8 cm, dorsal opening 4–8.5 cm, apex acute, margins covered with light brown hairs, outside with a layer of strands joined together, very light cream-colored, thicker up to 0.05 mm; inside with two layers of interwoven strands, brownish; peduncle covered with tomentum, short, 7.9 cm long, width basally 0.4 cm, distally 0.8 cm; peduncular bract 1, 22–32 cm long, 1.6–2 cm wide, bicarinate, base tubular, rachis bracts overlapping, ventral opening up to 9 cm, dorsal opening 1.6 cm, apex acute, slightly bifid, with margins covered with light brown hairs; rachis up to 13.1 cm long, width basally 0.6 mm and distally 0.8 mm, covered with arachnoid indument; rachis bracts spirally arranged, base tubular, apex entire, acute, rigid; first rachis bract up to 40 cm long, 2.5 cm wide, lateral opening up to 7.9 cm, secondary rachis bract up to 27 cm long, 2–2.5 cm wide,



4. A tall and old *Coccothrinax spiritwana* in its habitat. Photo by R. Verdecia.

all of them longitudinally striate, basally glabrous, covered outside from the opening to the apex with cottony white indument; primary branches slender, 32–39 cm long, 4.5–6 mm diameter, basal bract 5–9 mm long; all bracts persistent; rachillae around 30 per primary branch, basally 7–12 cm long, 1.5–

mm thick; rachilla bracts 2.5–4 mm long, triangular, acute apically. Flowers solitary, with pedicel 1.5–2.5 mm long, bracteoles triangular, 0.6–0.8 mm long; perianth 6, 0.9–1.0 mm long, connate at the base 0.4–0.5 mm, cupuliform, filiform towards the apex; stamens 6, exserted, filaments connate for 0.1–0.2 mm,



5 (top). *Coccothrinax spirituana*, detail of leaf sheath with a long free strands tips. 6 (bottom). Infructescence of *Coccothrinax spirituana* with ripe fruits. Photos by R. Verdecia.



7. Vegetation at San Felipe "cuabal" with *Coccothrinax spirituana*. Photo by R. Verdecia.

1.3–1.5 mm long, 0.4 mm wide at base, triangular, acute and free distally; anthers oblong, 0.8–2 mm long, 0.4 mm wide, dorsifixed subapically, base sagittate at maturity; ovary globose, 0.7–0.8 mm in diameter; style up to 1 mm long, cylindrical at the base, gradually widening in the upper half; stigma infundibuliform, 0.5 mm long, 0.5 mm wide. Infrutescences interfoliar, pendant. Fruit depressed–globose to globose, 9–10.5 × 12–13 mm when fresh, 6.8–8.8 × 6.5–8.1 mm dry; pedicels 2.5–4 mm long; epicarp smooth, shiny, light purple to dark reddish–purple at maturity (Fig. 6). Seed depressed–globose to globose, cerebriform, 6.2–8.2 × 5.2–7.5 mm, grooves 4–6, wide and deep; endosperm homogenous, intruded partially through the center from apex to near the base. Eophyll lanceolate, very narrow, rigid, with 3 prominent veins adaxially, greenish, 15–29 cm long, 2.5–3 cm wide.

Specimens examined: CUBA. Province Sancti Spiritus, Municipality Jatibonico, San Felipe, Arroyo Blanco, 3 Aug. 1995, C. Moya with H. Rodríguez & P. Mayotte s.n. (HJBSS!); 3 Aug. 1995, C. Moya with H. Rodríguez & P. Mayotte s.n. (HJBSS!); 1 Sep. 1995, C. Moya with L.

Cañizares & L. Martínez-Pentón s.n. (HJBSS!); 1 Sep. 1995, C. Moya with L. Cañizares & L. Martínez-Pentón s.n. (HJBSS!); 1 Sep. 1995, C. Moya with L. Cañizares & L. Martínez-Pentón s.n. (HJBSS!); 1 Sep. 1995, C. Moya with L. Cañizares & L. Martínez-Pentón s.n. (HJBSS!); 1 Sep. 1995, C. Moya with L. Cañizares & L. Martínez-Pentón s.n. (HJBSS!); 2 Jul. 2015, R. Verdecia with J.P. García-Lahera RV15/06 (HMC!), 2 Jul. 2015, R. Verdecia with J.P. García-Lahera RV15/07 (HMC!), 2 Jul. 2015, R. Verdecia with J.P. García-Lahera RV15/08 (HMC!).

ETYMOLOGY: Named for the province of Sancti Spiritus. The ghostly white color of the leaves can be seen on the satellite image (Fig. 3).

DISTRIBUTION: Central Cuba, sector Camagüeyicum, district Claraëense in the sector Eastern Central Cuba (Borhidi 1996). Province Sancti Spiritus, municipality Jatibonico and province Ciego de Avila, municipality Florencia.

HABITAT: The "cuabal of San Felipe" (Fig. 7) is a dry evergreen thorny shrub-land on serpentine soil, located on the eastern side of the district Claraëense in the Eastern Central



8. *Coccothrinax spirituana* (foreground) and *C. clarensis* ssp. *clarensis* (background). Photo by R. Verdecia.

sector of Cuba (Borhidi 1996), consisting of slightly undulating hills, 185–235 m elevation. The main vegetation types on the San Felipe outcrop are secondary thorny xeromorphic serpentine shrub land, pine forest plantation, secondary serpentine grassland, and gallery forest. (Bécquer et al. 2003). Dominant shrubs and trees include the following species: *Brya ebenus*, *Bursera inaguensis*, *Diospyros crassinervis*, *Ternstroemia peduncularis*, *Pera bumeliefolia*, *Byrsonima lucida*, *Jacaranda cowellii*, *Gochmatia cowellii*, *Phyllanthus orbicularis*, *Reedia fruticosa*, *Maytenus buxyfolia* and *Chamaecrista lineata*. *Coccothrinax clarensis* ssp. *clarensis* also shares the habitat with *C. spirituana* (Fig. 8). The climate is seasonal, with a rainy period from May to October and a dry season in the winter.

CONSERVATION STATUS: Vulnerable [VU D2]. Known only from San Felipe, the eastern area of district Clarence, growing on serpentine. The area of occupancy is estimated to be less than 25 km². The species is threatened with habitat loss, because it grows in a forested area that is being mined, subsequently destroying natural vegetation that is being replaced with exotic species such as *Eucalyptus* spp.,

Casuarina equisetifolia and *Acacia mangium*. This causes the entry of invasive species such as *marabú* (*Dichrostachys cinerea*). The serpentine rock is mined for use as a road base throughout the area.

NOTES: The species belongs to subsection *Coccothrinax* of section *Coccothrinax*, according to the classification of Muñiz and Borhidi (1982), and Miraguama complex of the Pauciramosa Group, according to the informal classification of Nauman and Sanders (1991).

FLOWERING: June and October.

USES: The leaves are cut to make brooms, although those of *C. clarensis* produce better quality fibers that are preferred by local people. It is cultivated in Florida as an ornamental.

GERMINATION AND CUTIVATION: Seed collected by Verdecia in 2010 from the "cuabal" of the Cuban National Botanical Garden germinated in 15 days and produced seedlings in two months. These were planted after three years in volcanic soil and now are up to 3 m tall. Sancti Spiritus Botanical Garden has seedlings from seed collected by Garcia-Lahera in November 2015.

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