

***Copernicia hospita* and *C. yarey* (Arecaceae): Updated Distribution for these Cuban Endemics**

***Copernicia hospita* y *C. yarey* (Arecaceae): Distribución Actualizada de estos Endémicos Cubanos**

CELIO E. MOYA LÓPEZ AND YASIEL HERNÁNDEZ RIVERO

Abstract

In new genus and species records, *Copernicia hospita* is documented in the Alturas de Sancti Spíritus and Massif of Guamuhaya and *C. yarey* is documented at La Mensura in the Mensura-Pilotos National Park in the Sierra de Nipe, Cuba. The maximum elevation where *Copernicia* occurs in Cuba is reported. The distribution of both species in Cuba, including municipalities for the provinces of Sancti Spíritus and Holguín, is discussed.

Resumen

En nuevos registros de género y especie se documenta *Copernicia hospita* en las Alturas de Sancti Spíritus y Macizo de Guamuhaya y *C. yarey* se documenta en La Mensura en el Parque Nacional Mensura-Pilotos en la Sierra de Nipe, Cuba. Se reporta la elevación máxima donde ocurre *Copernicia* en Cuba. Se discute la distribución de ambas especies en Cuba, incluyendo municipios de las provincias de Sancti Spíritus y Holguín.

Introduction

Copernicia is placed in the tribe Trachycarpeae of the subfamily Coryphoideae and includes 20 species: three in South America, two in Hispaniola, and 15 in Cuba, where several natural hybrids occur (Dransfield et al. 2008). In addition to the 15 species in Cuba, two varieties and nine natural hybrids occur, which total 26 taxa, all endemic (Moya 2022).

In 1823, Poeppig was the first to collect *Copernicia* in Cuba when he found what would become *C. hospita* in the "Lomas de Santa Ana," in Jovellanos municipality of Matanzas province. Later, Martius (1838) named and described *C. hospita* based on Poeppig's collection. Yasiel Hernández Rivero relocated the type locality on June 12, 2021 (Moya 2021).



1. Map and distribution of *Copernicia hospita* (silver green dots in and along margins of bare, dark grayish brown area) in Loma del Obispo, Alturas de Sancti Spíritus. © 2023 C. E. Moya López. Drawn over Cuban map from *hicuba.com*, Google map and Google Earth.



2. *Copernicia hospita*, Moya s.n., Loma del Obispo, southwest of the city of Sancti Spíritus.
© Herbarium of Sancti Spíritus Botanical Garden.

Dahlgren and Glassman (1963) reported *Copernicia hospita* for the current provinces of Camagüey, Ciego de Ávila, Cienfuegos, Matanzas, Sancti Spíritus, and Villa Clara. In Sancti Spíritus, *C. hospita* is known from the municipalities of Cabaiguán, Jatibonico, La Sierpe, Trinidad, and Sancti Spíritus municipalities (Moya et al. 1989, Moya 1997). Generally, *C. hospita* is distributed in Central Eastern and Central Western Cuba (Moya 1999a) where it occurs as widely scattered individuals and small groups, often on disturbed or cultivated land (Moya and Mayotte 1996). This highly ornamental species was not threatened (Moya 1999b).

Ekman first collected *Copernicia yarey* in 1917 and later Burret (1929) named and described it based on Ekman's collection. Moya and Berazaín (2023) showed that the true type locality of *C. yarey* is really the location called Cabo Cruz in the Bay of Santiago de Cuba, in the municipality and province of the same name.

Dahlgren and Glassman (1963) reported *Copernicia yarey* for the current provinces of Camagüey, Granma, Guantánamo, Holguín, Las Tunas, and Santiago de Cuba. Shafer made the first collection of *C. yarey* in Holguín province in 1909, from barren savannas southeast of the city of Holguín. León (1936) noted two new localities for *C. yarey* in Holguín, Fraile and Yuraguana de Pesquero, and a third in Cacocum municipality. Seifriz (1943) also reported *C. yarey* for savannas in Holguín, as did Marie-Victorin and León (1944), when they said the first stop after departing Holguín is a group of *bohios* in a savanna with *C. yarey*. They described *C. yarey* as the primary palm in coastal scrub vegetation or *maniguas*. González (2015) reported *C. yarey* in Gibara municipality.

In the first report of *Copernicia yarey* for Mayarí municipality, Carabia (1945) reported that it occurred in the savannas or *charrascales* (stubble or scrub) of the Sierra de Nipe near La Mensura, where it occurred with two other palms, *Bactris cubensis* and *Coccothrinax orientalis*. This area now includes the Mensura-Pilotos National Park and is in the physical-geographical region Montañas de Nipe-Cristal of the Nipe-Sagua-Baracoa Mountain Massif, which occurs in the municipalities of Mayarí and Holguín. The primary access is the Mayarí-La Mensura road (Ruiz-Plasencia et al. 2019).

To understand and appreciate better the distribution of *Copernicia hospita* and *C. yarey* in this discussion, note that Borhidi and Muñiz (1986, 1996) divided the phytogeographic province of Cuba into three sectors: Western Cuba, Central Cuba and Eastern Cuba. They considered three sectors to Central Cuba: Camagüeyicum, Havanicum, and Trinidadicum, the latter divided into the districts Spirituense and Trinidadense.

The main objective of this paper is to provide an update to the presence of two *Copernicia* species in mountainous regions: *C. hospita* in Central Cuba and *C. yarey* in Eastern Cuba.

Materials and Methods

The study was conducted in the Guamuhaya massif in Sancti Spíritus municipality and province, which is in the Spirituense phytogeographic district of the Trinidicum sector of Central Cuba. Work was also performed in Mensura-Pilotos National Park, Holguín province. Its highest elevation is on La Mensura mountain at 995 meters elevation (Ruiz-Plasencia et al. 2019) in the Nipense phytogeographic district of the Moanicum sector of Eastern Cuba.

For taxa distributions, I mainly consulted the herbarium specimens of *Copernicia hospita* and *C. yarey*, as well as Martius (1838), Burret (1929), León (1936), Seifriz (1943), Marie-Victorin and León (1944), Carabia (1945), Dahlgren and Glassman (1963), Moya (1997; 1999a, b; 2021, 2022); Moya and Mayotte (1996), Moya and Berazaín (2023), Moya et al. (1989), Gómez and Cuellar (2012), González (2015, 2016), González et al. (2003; 2004–2005a, b; 2006; 2015; 2018), and personal communications (pers. comm.) of Eldis Bécquer Granados, José Luis Gómez Hechavarría, Angel E. Motito Marín, and Ramona Oviedo Prieto.

I found a total of 298 specimens associated with *Copernicia hospita* and *C. yarey* in 18 herbaria: A, B, BH, C, F, FLAS, G, GH, HAC, HAJB, K, MA, MT, NY, P, S, US, and USF (acronyms from Thiers 2023). I examined and obtained location data from 133 wild-collected specimens of the 22 primary collectors of *C. hospita* and *C. yarey*.

I also reviewed all pertinent material in the National Herbarium of Cuba "Onaney Muñiz" of the Institute of Ecology and Systematics (HAC) and herbarium of the Sancti Spíritus Botanical Garden, which is listed as JBSS herbarium.

I have maintained field observation records for the last 25 years. My field observation number system is in this format: *Serie Moya XXXX*.

All specimens cited were examined from high-resolution photographs except for those at HAC, which I examined in person. Specimens seen by the author are marked with "!", those not seen with "[n.v.]," and those without marks were seen as digital images.

For the biogeography of Cuba, I follow Borhidi and Muñiz (1986, 1996). The geographical distribution information includes the country in uppercase letters, followed in alphabetical order by the province with the municipalities in parentheses. The biogeographical information includes the province in uppercase letters, followed by the subprovince and the corresponding sector, with the districts in parentheses. The origin of the information used for each municipality or



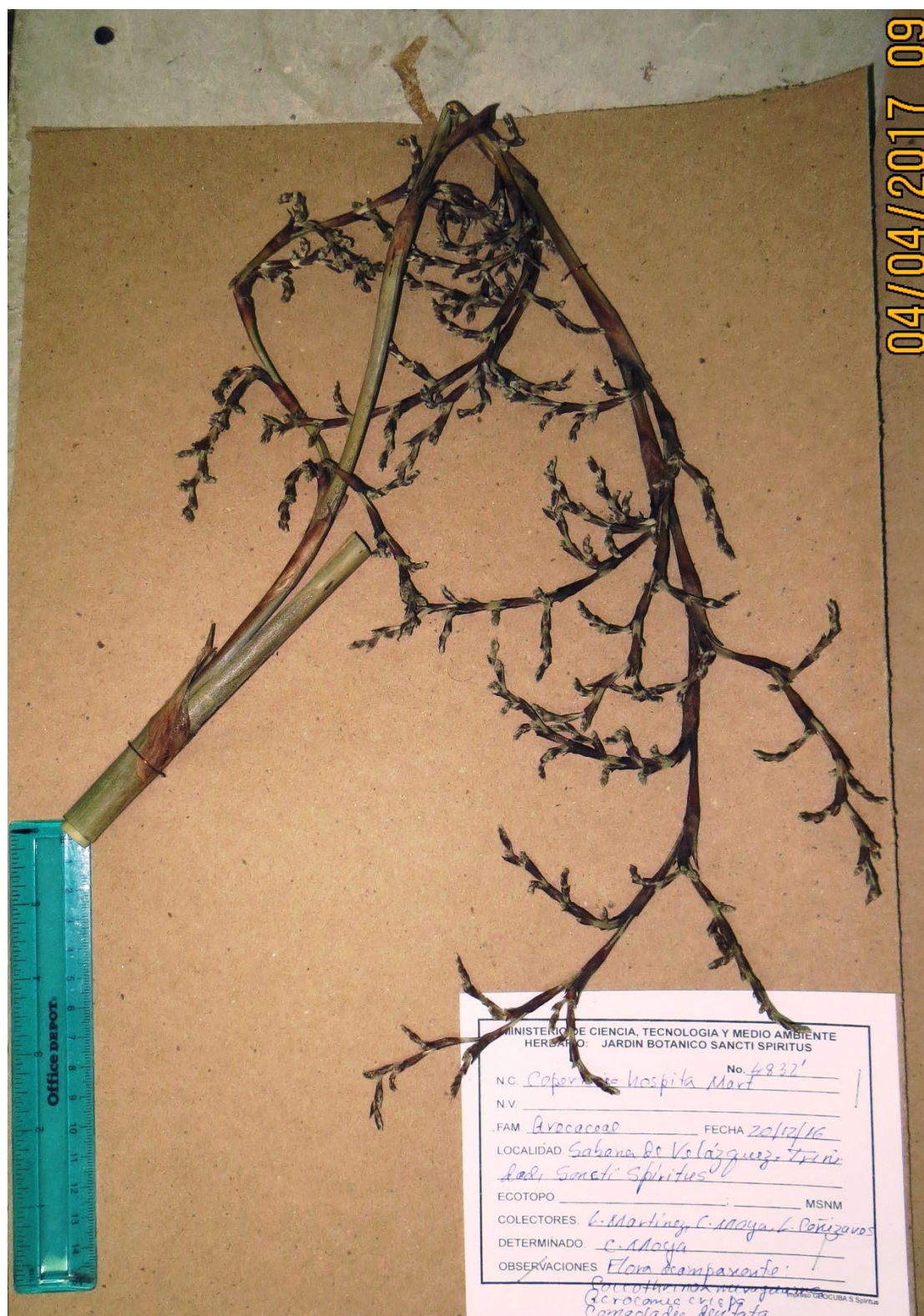
3. Lester Martínez prepares to make a collection of *Copernicia hospita*, Sabana de Velázquez, Alturas de Sancti Spíritus, Cuba. © 2016 C. E. Moya López.

district is denoted by adding the superscripts “H” for herbarium specimen, “R” for bibliographic reference, “A” for author field observations, and “P” for personal communications.

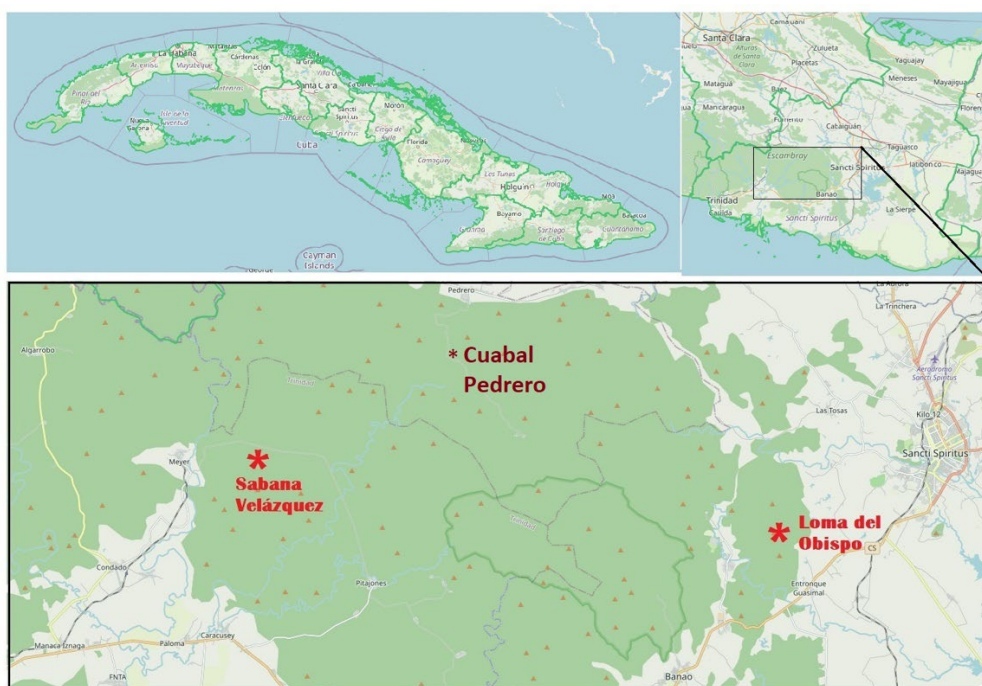
Results and Discussion

Copernicia hospita Mart., Hist. Nat. Palm. 3: 243. 1838.

Until the present, *Copernicia hospita* was only reported from the Camagüeyicum and Havanicum sectors of Central Cuba. Its presence is reported for the first time in the Spirituense and the Trininadense biogeographic districts of the Trinidadicum sector of Central Cuba in Sancti Spíritus and Trinidad municipalities.



4. *Copernicia hospita*, Moya s.n., Sabana de Velázquez, Trinidad municipality, Sancti Spíritus province. © Herbarium of Sancti Spíritus Botanical Garden.



5. Distribution of *Copernicia hospita*, Loma del Obispo and Sabana de Velázquez, Alturas de Sancti Spíritus. © 2023 C. E. Moya López. Drawn over map from *hicuba.com*



6. *Copernicia hospita* in cuabal south of Las Minas de Jarahueca, Cabaiguán municipality, Sancti Spíritus province. © R. M. Verdecia Pérez.



7a. *Copernicia hospita*, road from El Pedrero to Fomento, Fomento municipality, Sancti Spíritus province. © L. R. González-Torres.



7b. *Copernicia hospita*, leaf and inflorescence, road from El Pedrero to Fomento, Fomento municipality, Sancti Spíritus province. © L. R. González-Torres.

Staff of the Sancti Spíritus Botanical Garden collected *Copernicia hospita* in Loma del Obispo at the western limit of the Spirituense district in Sancti Spíritus municipality 26 years ago (**Figs. 1–2**). In the eastern limit of the Spirituense district in the Trinidad municipality, three former members of Sancti Spíritus Botanical Garden collected *C. hospita* in Sabana de Velázquez (**Figs. 3–4**). Both collections were deposited in the herbarium of the Sancti Spíritus Botanical Garden. Both localities are located in the Sancti Spíritus province at the ends of Alturas de Sancti Spíritus (**Fig. 5**). Also, the presence of *C. hospita* is reported for the first time for the municipalities of Cabaiguán, Fomento, and Jatibonico in the province of Sancti Spíritus.

The Distribution of *Copernicia hospita* by Municipality for Sancti Spíritus Province

CUBA. Sancti Spíritus province. **Cabaiguán** municipality. Herbarium evidence: S of Las Minas de Jarahueca, 11 Mar. 1999, *Barboza and Moya* 771 (NYx2), 772 (NYx2); 22 May 2016, L. Martínez, García-Lahera, and Pérez, silver form, *Serie Moya* 1610 (JBSS4833x4!), green form, *Serie Moya* 1611 (JBSS4834x2!), *Serie Moya* 1613 (JBSS4836x2!). Field observation: 31 Jul. 2016 (**Fig. 6**), Moya, L. Martínez, Verdecia, and García-Lahera, green form, *Serie Moya* 1625, silver form, *Serie Moya* 1626. **Fomento** municipality. Field observation: Cuabal road El Pedrero to Gavilanes (**Figs. 7a–b**), 8 Feb. 2004, E. Bécquer (pers. comm. 3 Jul. 2022). **Jatibonico** municipality. Field observation: San Felipe, 3 Aug. 1995, Moya and P. Mayotte; 3 Sep. 1995, Moya and L. Martínez. **La Sierpe** municipality. Herbarium evidence: N. of finca Galleguitas, 1950, *Glassman* 5033 (F [n.v.]), *Glassman* 5035 (F [n.v.]); Romero, 23 Sep. 1995, *Moya and L. Martínez s.n.* (JBSS2030!). Field observation: Coto de Caza, 1 Mar. 2000, Moya and L. Martínez; S. of Peralejo, 21°38'15"N 79°18'37"W, 17 Dec. 2016, Moya, L. Martínez, Suárez, and M. Rodríguez, *Serie Moya* 1668; N. of Ferrolana (**Fig. 8**), 18 Dec. 2016, Moya, L. Martínez, M. Rodríguez y Suárez, *Serie Moya* 1683. **Sancti Spíritus** municipality. Herbarium evidence: río Tayabacoa, Jun. 1931, *León* 14915 (Px2); Loma del Obispo, 21 Jan. 1996, *Moya et al. s.n.* (JBSSx6!); 10 Mar. 1999, *Barboza and Moya s.n.* (NYx4). Field observation: NE. ejunction Guasimal, 1 Aug. 2000, Craft and Moya. **Trinidad** municipality. Field observation: Sabana de Casilda, 23 Aug. 1995, *Moya and L. Martínez*; Herbarium evidence: Sabana de Velázquez, submontane valley, 21°55'22"N 79°46'13"W, 66.2 m, 20 Dec. 2016, Moya, L. Martínez, and Cañizares, *Serie Moya* 1684, (JBSS4832! x4). Field observation: hills to the SW. of Hermita, 3 May 2015, Moya and L. Martínez; cattle pasture on road to San Pedro, 3 Mar. 2016, Moya and García-Lahera, *Serie Moya* 1601a. Evidence of use of leaves: near San Pedro, 3 Mar. 2016, Moya and García-Lahera, *Serie Moya* 1601b. **Yaguajay** municipality. Herbarium evidence: Venegas sabana arenosa, 31 Dic. 1934, *León* 16207 (HAC, GH). A report to document its occurrence in Taguasco municipality is lacking.



8. *Copernicia hospita*, north of Ferrolana, La Sierpe municipality, Sancti Spíritus province.
© 2016 C. E. Moya López.



9. Leonardo Cañizares provides scale for *Copernicia hospita*, Sabana de Velázquez, Alturas de Sancti Spíritus. © 2016 C. E. Moya López.



10. Distal portion of inflorescence of *Copernicia hospita*, Sabana de Velázquez, Alturas de Sancti Spíritus. © 2016 C. E. Moya López.



11. Regeneration of *Copernicia hospita*, Sabana de Velázquez, Alturas de Sancti Spíritus. © 2016 C. E. Moya López.



12. Moss (*Octoblepharum albidum* Hedw. [ID by Motitos], on trunk, *Copernicia hospita*, Sabana de Velázquez, Alturas de Sancti Spíritus. © 2016 C. E. Moya López.



13. *Copernicia hospita* growing with *Acrocomia crispa* and *Coccothrinax miraguama*, Sabana de Velázquez, Alturas de Sancti Spíritus. © 2016 C. E. Moya López.

Copernicia hospita is abundant in the new locality of Sabana de Velázquez in Trinidad municipality (Figs. 9–13) where it occurs with *Acrocomia crispera* and *Coccothrinax miraguama* (Fig. 13).

Updated Distribution of *Copernicia hospita*

Geographical Distribution. CUBA. Provinces Camagüey (Camagüey^H, Florida^H, Minas^H, Nuevitas^H, Sierra de Cubitas^H, Esmeralda^R, Jimaguayú^R), Ciego de Ávila (Baraguá^H, Florencia^A), Cienfuegos (Abreus^H, Cienfuegos^H, Rodas^A), Matanzas (Jovellanos^H), Sancti Spíritus (Cabaiguán^H, Fomento^P, Jatibonico^A, La Sierpe^H, Sancti Spíritus^H, Trinidad^H, Yaguajay^H), and Villa Clara (Corralillo^H, Placetas^H, Santo Domingo^H).

Biogeographical Distribution. CUBA province, Central Cuba subprovince: sectors Havanicum (Casildense^H, Jarucoense^H, Güinense^H), Camagüeyacum (Camagüeyense^H, Claraense^H, Guaimareense^H, Sagüense^H), and Trinidadicum (Spirituense^H, Trinidadicum^H).

***Copernicia yarey* Burret, Kongl. Svenska Vetensk. Acad. Handl., ser. 3, 6(7): 7. 1929.**

The Distribution of *Copernicia yarey* var. *yarey* by Municipality for Holguín Province

CUBA. Holguín province. **Antilla** municipality. Bibliographic report: El Ramón peninsula, González and Carmenate (2018). **Banes** municipality. Herbarium evidence: Ad portum, 10 Nov. 1915, *Ekman* 6557 (NY, Sx2). Bibliographic report: cabo Lucrecia-punta de Mulas, González et al. (2015); Embarcadero de Río Seco y Punta Caleta Honda, González (2016). **Calixto García** municipality. Herbarium evidence: Río Rioja, 3 Mar. 1915, *Ekman* 4837 (S). **Cacocum** municipality. Herbarium evidence: E. of Cacocum, 25 Apr. 1909, *Shafer* 1542 (NYx3, US [n.v.]); hacienda Pesquero, 2 Mar. 1932, *León* 15547 (HAC!); Yuraguanal de Pesquero, 3 Jul. 1932, *León* 15683 (NY). **Frank País** municipality. Bibliographic report: Bahía de Cananova-Bahía de Cebollas, González et al. (2003); costa Corinthia-Barrederas, González et al. (2006). **Gibara** municipality. Bibliographic report: coast line, González (2015). **Holguín** municipality. Herbarium evidence: Barren Savannas SE. of Holguin, 20 Apr. 1909, *Shafer* 1471 (NYx3, US [n.v.]); Cerro del Fraile, 28 Oct. 1914, *Ekman* 3245 (Sx2); sabanas cerca de Holguín, May 1931, *León* 14879 (type *Copernicia holguinensis* León), collected by J. Garcia and G. Aguayo (A, BH, F [n.v.], HAC x3!, MT, NYx2, P, US); río Purnio, cerca Fraile, 3 Jan. 1934, *León* 15894 (HACx2!); borde río Purnio, El Fraile, 3 Jan. 1934, *León* 15896 (HAC!); al pie del Fraile, 27 Jul. 1935, *León* 12693 (HAC!); serpentine Holguín, 20 May 1956, *López Figuera and Dahlgren* 2727 (HACx2!). Holguín, *Dahlgren and Cutler* 49/062 (F [n.v.]); Nocturno, 1 km E. Holguín, 1 Apr. 1999, *Barboza* 819 (NYx2). Bibliographic report: serpentine of San Andrés, Gómez and Cuellar (2011–2012). **Mayarí** municipality. Herbarium evidence: Arroyo to Piedra Gorda, 8 Jan. 1910, *Shafer* 3495 (NYx2, US [n.v.]); Loma Bandera, Jul. 1941, *León* 20468 (HAC!);



14. *Copernicia yarey*, base of La Mensura, Sierra de Nipe, Holguín. © 2013 J. L. Gómez-Hechavarría.



15. *Copernicia yarey*, climb to the Summit of La Mensura, Sierra de Nipe, Holguín. © 2011 J. L. Gómez-Hechavarría.

loma de Winch, 22 Abr. 1960, *Alain and Acuña 8059* (HACx3!); cerca Loma Mensura, 25 Aug. 1993, *Salzman 472* (FLASx5). Bibliographic report: “charrascales” Sierra de Nipe, Carabia (1945). Field observation: La Mensura-Piloto National Park (**Figs. 14–15**): climb to the “Loma La Mensura,” subspinous xeromorphic scrub on serpentine, 850–900 m, 20° 30' 0" N, 75° 49' 0" W; base of “Loma La Mensura,” sclerophyll rain forest fragment, 770 m; “Loma La Bandera,” subspinous xeromorphic scrub on serpentinite, 20° 34' 60" N, 75° 43' 60" W; “Charrascal La Caridad,” 510 m, all by José Luis Gómez Hechavarría (pers. comm., 18 Mar. 2017). **Moa** municipality. Herbarium evidence: Centeno, Aug. 1945, *León et al. 22691* (HAC!, GH, USF). **Rafael Freyre** municipality. Bibliographic report: costa Bahía de Vita-Pesquero, González et al. (2004–2005a); Caletica, González et al. (2004–2005b). Reports to document its occurrence in Cueto, Sagua de Tánamo, and Urbano Noris municipalities are lacking.

Updated Distribution of *Copernicia yarey*

Geographical Distribution. CUBA. Provinces Camagüey (Esmeralda^H, Florida^H, Nuevitas^H, Sierra de Cubitas^H), Ciego de Ávila (Moron^H), Granma (Bayamo^H, Niquero^H, Pilón^H), Holguín (Báguanos^H, Banes^H, Cacocum^H, Calixto García^H, Frank País^R, Gibara^H, Holguín^H, Mayarí^H, Moa^H, Rafael Freyre^R), Las Tunas (Jobabo^H, Las Tunas^H, Manatí^H), Matanzas (Martí^P), Santiago de Cuba (Guama^H, Mella^H, Santiago de Cuba^H), and Villa Clara (Caibarien^H).

Biogeographical Distribution. CUBA province, Central Cuba subprovince: sector Camagüeyacum (Gibarense^H, Holguinense^H, Sagüense^H). Eastern Cuba subprovince: sectors Moanicum (Nipense, Moaense), Santiagicum (Pilonnense, Uveroense).

Verdecia (2014) reported *Copernicia yarey* in Jobabo municipality. Ramona Oviedo (pers. comm.), 2 Feb. 2019), reported *C. yarey* at “Ciénaga de Majaguillar” and Cayos de Cinco Leguas,” both in Martí municipality, Matanzas province.

Report of *Copernicia yarey* on La Mensura is the Highest Elevation for *Copernicia* in Cuba

At the base of La Mensura, at an elevation of approximately 770 m (**Fig. 14**), *Copernicia yarey* occurs in a shady and humid fragment of sclerophyll rain forest. However, it also occurs even higher, at 850–900 m elevation and there in subspiny xeromorphic scrub on serpentine, which is the highest elevation for the genus in Cuba (Gómez, pers. comm., 18 Mar. 2017) (**Fig. 15**).

Acknowledgements

I am grateful to Donald R. Hodel for carefully reviewing the manuscript and improving the English of the manuscript. Special thanks go to José Luis Gómez Hechavarría, of Holguín Botanic Garden of the Center for Research and Environmental Services of Holguín (CISAT), for photos and information about the species in Sierra de Nipe and to Léster Martínez Pentón, Leonardo Cañizares Castañeda, and the Ranger Corps of Sancti Spíritus area for accompanying me on the expedition. Thanks also go to the facilities offered at HAC for the review of the specimens studied, especially to Bertha L. Toscano and Jovani Rojas for their great help for this study. We also thank staff of the following herbaria whom we have consulted online B, F, FLAS, G, K, NY, P, S, and US, as well as the GBIF, JSTOR, Mid-Atlantic Herbaria Consortium, and Tropicos; Angel E. Motito Marín of Oriental Center for Ecosystems and Biodiversity for the identification of the moss on the stem of *Copernicia hospita*; Ramona Oviedo Prieto of Cuban National Herbarium (HAC) for the report for Martí municipality; Eldis Bécquer Granados of Cuban National Botanic Garden, for the report for Fomento municipality; Luis R. González-Torres of the University of British Columbia and Raúl Verdecia Pérez of Las Tunas University for the photos; and an anonymous reviewer for checking the manuscript and providing helpful suggestions. All have my sincere thanks.

Literature Cited

- Borhidi, A. and O. Muñiz. 1986. The phytogeographic survey of Cuba: 2. Floristic relationships and phytogeographic subdivision. *Acta Bot. Hung.* 32(1–4): 3–48.
- Borhidi, A. and O. Muñiz. 1996. *Phytogeography and Vegetation Ecology of Cuba*. 2nd ed. Akademia Kiado, Budapest, Hungary.
- Burret, M. 1929. *Palmae Cubenses et Domingenses a Cl. E. L. Ekman 1914–1923 lectae*. *Kungliga Svenska Vetenskapsakademiens Handlingar*. Stockholm III. 6(7): 3–28.
- Carabia, J. P. 1945. The Vegetation of Sierra de Nipe, Cuba. *Ecological Monographs* 15(4): 321–341.
- Dahlgren, B. and S. Glassman. 1963. A revision of the genus *Copernicia*. 2. West Indian Species. *Gentes Herbarum* 92): 43–232.
- Dransfield J., N. W. Uhl, C. B. Asmussen, W. J. Baker, M. M. Harley, and C. Lewis. 2008. *Genera Palmarum: The Evolution and Classification of Palms*. Royal Botanic Gardens, Kew.

- Gómez Hechavarría, J. L. and N. Cuellar Araújo. 2011–2012. Flora de las serpentinitas de San Andrés, Holguín, Cuba. *Revista del Jardín Botánico Nacional* 32–33: 111–124.
- González Gutiérrez, P. A. 2015. Reporte de exploraciones botánicas en localidades de Gibara, provincia Holguín, Cuba. *Revista del Jardín Botánico Nacional*. 36: 103–111.
- González Gutiérrez, P. A. 2016. Inventario florístico de la franja de costa entre el Embarcadero de Río Seco y Punta Caleta Honda, Banes, Holguín, Cuba. *Revista del Jardín Botánico Nacional*. 37: 153–163.
- González Gutiérrez, P. A., S. I. Suárez Terán, A. R. Almaguer and A. Vega Torres. 2003. Vegetación y flora de la localidad Bahía de Cananova-Bahía de Cebollas, Frank País, Holguín. *Acta Botánica Cubana* 193: 1–13.
- González Gutiérrez, P. A., S. I. Suárez Terán, S. Sigarreta Vilches, A. Fernández Velásquez and O. Laffita Gámez. 2004–2005a. Apuntes sobre la flora y la vegetación del sector costero Bahía de Vita-Pesquero, Rafael Freyre, Holguín. *Revista del Jardín Botánico Nacional* 25–26: 119–130.
- González Gutiérrez, P. A., S. I. Suárez Terán, S. Sigarreta Vilches, A. Fernández Velásquez, and O. Laffita Gámez. 2004–2005b. Flora y vegetación de Caletica, Rafael Freyre, Holguín. *Revista del Jardín Botánico Nacional* 25–26: 131–140.
- González Gutiérrez, P. A., J. L. Verdecia, O. Leyva, A. Matos and R. Peña. 2006. Apuntes sobre la flora y la vegetación del sector costero Corinthia-Barrederas, Frank País, Holguín. *Revista del Jardín Botánico Nacional* 27: 33–45.
- González Gutiérrez, P. A., J. L. Gómez Hechavarría, O. Leyva Bermúdez and Y. Hernández. 2015. Flora de la Reserva Florística Manejada cabo Lucrecia-punta de Mulas, Banes, Holguín. *Revista del Jardín Botánico Nacional*. 36: 65–77.
- González Gutiérrez, P. A. and W. Carmenate Reyes. 2018. Inventarios florísticos en localidades de la península El Ramón, Antilla, provincia Holguín, Cuba. *Revista del Jardín Botánico Nacional*. 39: 59–73.
- León, Hno. 1936. Contribución al estudio de las palmas de Cuba. II. Género *Copernicia*. *Mem. Soc. Cubana Hist. Nat. "Felipe Poey"* 10: 203–226.

- Marie-Victorin, Fre. and Fre. León. 1944. Itinéraires botaniques dans l'île de Cuba. Contributions de l'Institut Botanique de l'Université de Montreal. No. 50, 2me. série.
- Martius, C. F. P. von. 1838. Historia Naturalis Palmarum. 1, 3. T. O. Weigel, Leipzig.
- Moya López, C. E. 1997. *Copernicia* in Sancti Spiritus, Cuba. Palms & Cycads (Australia) 54: 8–11.
- Moya, C. E. 1999a. The Cuban Ornamental Palms. In: Caballero, M. Proceed. 2nd. International Symposium Ornamental Palms Other Monocots. Tropic. Acta Hort. 486: 53–57.
- Moya, C. E. 1999b. Considerations on Ecology and Distribution of Cuban *Copernicia*. In: Caballero, M. Proceed. 2nd. International Symposium Ornamental Palms Other Monocots. Tropic. Acta Hort. 486: 149–154.
- Moya López, C. E. 2021. The Type Locality of *Copernicia hospita* Located 198 Years after Poeppig Collected It in Cuba. PalmArbor 2021-09:1–16.
<https://ucanr.edu/sites/HodelPalmsTrees/files/353854.pdf>
- Moya López, C. E. 2022. *Copernicia* × *molinetii* León (Arecaceae), New Status for a Natural Hybrid from Cuba. PalmArbor 2022-10: 1–20.
<https://ucanr.edu/sites/HodelPalmsTrees/files/377555.pdf>
- Moya López, C. E. and R. Berazaín Iturralde. 2023. Determinación de la localidad tipo de *Copernicia yarey* Burret (Arecaceae). In: XX Taller de la Flora de Cuba. Simposio de Diversidad Biológica y Conservación. La Habana (29 mayo–2 junio).
- Moya, C. and P. Mayotte. 1996. Paradiso principum(:) a palm paradise in Cuba. Principes 40(3): 152–156.
- Moya, C. E., J. Martínez-Fortún, J. L. Rios, J.L. Valdés and E. Acosta. 1989. Las Copernicias (yareyes y jatas) en Sancti Spiritus. Palmas endémicas que necesitan protección. Revista Jardín Botánico Nacional Habana 10(1): 49–62.
- Ruiz-Plasencia, I., J. Hernández-Albernas and E. Ruiz-Rojas. 2019. Catálogo de las áreas protegidas de Cuba. En: I. Ruiz (ed.). Las áreas protegidas de Cuba. Centro Nacional de Áreas Protegidas. 386 pp.
- Seifriz, W. 1943. The plant life of Cuba. Ecological Monographs 13: 375–426.

Thiers, B. 2023 [continuing]. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's virtual Herbarium.
<http://sweetqum.nybg.org/science/ih/> Accessed: 3 January 2023.

Verdecia, R. 2014. Monte Cabaniguán, donde reinan el guano y el yarey. *Flora y Fauna* 18(1): 14–18.

Celio E. Moya López is an independent researcher specializing in the biology of Cuban and Caribbean palms. celio.moya@gmail.com
<https://orcid.org/0000-0002-5033-483X>

Yasiel Hernández Rivero is a plant collector, owner of Jardín *Aristolochia*, Varadero, and research assistant at the Botanical Garden of Matanzas, Cuba. yasiel.aristolochia@gmail.com

Text © 2023 by Celio E. Moya López and Yasiel Hernández Rivero.
Photographs © 2023 by each photographer or institution.

Publication Date: 18 July 2023.

PalmArbor: <http://ucanr.edu/sites/HodelPalmsTrees/PalmArbor/>
ISSN 269083245

Editor-In-Chief: Donald R. Hodel

Hodel Palms and Trees: <http://ucanr.edu/sites/HodelPalmsTrees/>