

## ***Copernicia × molinetii* León (Arecaceae), New Status for a Natural Hybrid from Cuba**

## ***Copernicia × molinetii* León (Arecaceae), Nuevo Estatus para Híbrido Natural de Cuba**

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### **Abstract**

*Copernicia molinetii* has characters intermediate between two other species, *C. gigas* and *C. hospita*, strongly demonstrating that it is a hybrid; I report this new status here. The remaining eight natural hybrids of *Copernicia* in Cuba are briefly reviewed and summarized.

### **Resumen**

*Copernicia molinetii* tiene caracteres intermedios entre otras dos especies, *C. gigas* y *C. hospita*, lo que demuestra claramente que es un híbrido; reporto aquí este nuevo estado. Se revisan y resumen brevemente los ocho híbridos naturales restantes de *Copernicia* en Cuba.

### **Introduction**

The Arecaceae (Palmae) family in Cuba includes 15 genera and 98 infrageneric taxa: 79 species; 10 infraspecific taxa; and 9 hybrids. Of the total, 85 infrageneric taxa are endemic (86.7 %), one of the highest proportions among the plant families in the country (Moya 2021a).

*Copernicia* includes 21 species, three in South America, two in Hispaniola and 16 in Cuba, where several natural hybrids occur (Dransfield et al. 2008). For Cuba, 16 species, two varieties, and eight natural hybrids of *Copernicia*, all endemic, are currently reported, which total 26 taxa (Moya 2021a).

A natural hybrid is defined as the offspring of different species that, when crossed by a natural process, result in taxa with intermediate characters of their parent species. This concept supports the new status for the natural hybrid *Copernicia × molinetii*, collected only once (*León 14912*) in the southeast of the Sancti Spíritus province in Cuba. Here I summarize this hybrid and define its geographical and biogeographic distribution.



1. *Copernicia* × *escarzana*, cultivated at Fairchild Tropical Botanic Garden (94347 A), Miami, Florida. © 2012 D. R. Hodel.

## Materials and Methods

I examined the protologues, descriptions, and status changes related to the taxa of *Copernicia* in Cuba, including Martius (1853), Beccari (1907), Britton (1914), Burret (1929), León (1931, 1936), Dahlgren and Glassman (1958, 1959, 1963), Muñiz and Borhidi (1982), Verdecia (2014, 2016), Moya et al. (1989, 2019), Moya (2021b), and Verdecia and Verdecia (2021). Particular attention was paid to matters of nomenclature and the designation and disposition of type specimens.

I found a total of 15 specimens of *León 14912* associated with *Copernicia × molinetii* in nine herbaria: A, BH, F, HAC, MT, NY, P, S, and US (acronyms from Thiers 2016). I also reviewed all pertinent material in the National Herbarium of Cuba "Onaney Muñiz" of the Institute of Ecology and Systematics (HAC). 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 citation of specimens from HAC, where collections of different Cuban historical herbaria are currently kept, I followed Regalado et al. (2008). Thus: EEAB refers to the numbering of C. F. Baker at the Santiago de las Vegas Agronomic Experimental Station; LS, to the series of the Colegio de La Salle in Vedado (Havana); and Roig, to the Roig series. Because sometimes other numbers were added to the number assigned by the collector at the time of depositing the specimen in an herbarium that eventually became part of HAC, the number is still cited as being at HAC but is specified by adding "ex" followed by the acronym and the digits referring to the corresponding series, if any. Until HAC has barcodes, we use any available number that permanently identifies the specimen (see Art. 9C.1, Turland et al. 2018).

**Table 1** lists the authors who provided the change from species to hybrid and defined the parents of each hybrid, including León (1931), Dahlgren and Glassman (1959, 1963), Muñiz and Borhidi (1982), Verdecia (2014, 2016), Moya et al. (2019), and Verdecia and Verdecia (2021). The data for the comparisons in **Table 2** are from the protologues of the hybrid and its parents, descriptions in Dahlgren and Glassman (1963), and measurements made by the author in the 15 available herbarium specimens of *León 14912*.

A note about changing the status of a species to a hybrid: when a taxon at the rank of species is transferred from the non-hybrid category to the hybrid category at the same rank, the authorship remains unchanged but may be followed by an indication in parentheses of the original category, in this case (pro sp.) (see Article H.10, Note 1 and 50.1, Turland et al. 2018).



2. *Copernicia* × *sueroana* near Camalote, Camagüey. © 2017 D. R. Hodel.



3. *Copernicia × vespertilionum* and Duanny Suárez Oropeza near Playa Bonita, La Sierpe, Sancti Spíritus. © 2016 D. R. Hodel.



4. *Copernicia* × *shaferi* northeast of Camagüey city, Camagüey. © 2017 D. R. Hodel.

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The origin of the information used for Geographical and Biogeographical Distribution is from herbarium specimens and is denoted by the superscripts “<sup>H</sup>”.

## Results

### Brief history of the natural hybrids of *Copernicia* in Cuba

All natural hybrids of *Copernicia* in Cuba show intermediate characters between their recognized parents.

**Table 1** summarizes the history of the correct name of natural hybrids in Cuban *Copernicia*. León (1931) proposed the first natural hybrids of *Copernicia* in Cuba and for the genus (Moya 2021b): *Copernicia* × *escarzana*, *C.* × *sueroana*, *Copernicia* × *vespertilionum*, and *C. textilis*, the latter now considered a hybrid. Later, León (1936) published *C. burretiana*, *C. occidentalis*, and *C. clarkii*, these three now considered hybrids. León (1936) also reassessed two of the hybrids he had

**Table 1. Natural hybrids of Cuban *Copernicia* and their parents listed chronologically by date of attaining hybrid status.**

Correct Name and its [synonyms]	Parent 1	Parent 2	Published	Hybrid Status by:
<b><i>C. × escarzana</i></b> <b>Fig. 1</b>	<i>C. hospita</i>	<i>C. macroglossa</i>	León 1931	
[= <i>C. × burretiana</i> ]			León 1936	Muñiz and Borhidi 1982 as hybrid. Moya et al. 2019 as synonym.
[= <i>C. × leoniana</i> ]			Dahlgren and Glassman 1958	Moya et al. 2019 as hybrid and synonym.
<b><i>C. × sueroana</i></b> <b>Fig. 2</b>	<i>C. hospita</i>	<i>C. rigida</i>	León 1931	
<b><i>C. × vespertilionum</i></b> <b>Fig. 3</b>	<i>C. gigas</i>	<i>C. rigida</i>	León 1931	
<b><i>C. × shaferi</i></b> <b>Fig. 4</b>	<i>C. cowellii</i>	<i>C. hospita</i>	Dahlgren and Glassman 1959	
<b><i>C. × textilis</i></b> <b>Fig. 5</b>	<i>C. baileyana</i>	<i>C. hospita</i>	León 1931	Dahlgren and Glassman 1963
<b><i>C. × occidentalis</i></b> <b>Fig. 6</b>	<i>C. brittonorum</i>	<i>C. curtissii</i>	León, 1936	Muñiz and Borhidi 1982
<b><i>C. × oxycalyx</i></b> <b>Fig. 7</b>	<i>C. baileyana</i>	<i>C. rigida</i>	Burret 1929	Verdecia 2014
[= <i>C. × clarkii</i> ]			León 1936	Dahlgren and Glassman 1963 as synonym. Verdecia and Verdecia 2021 as hybrid.
<b><i>C. × dahlgreniana</i></b> <b>Fig. 8</b>	<i>C. cowellii</i>	<i>C. macroglossa</i>	Verdecia 2016	

described five years earlier, *C. × sueroana*, and *C. × vespertilionum*, giving them species status because he found “individuals as loaded with fruits as any other normal species.” Dahlgren and Glassman (1958) published *Copernicia leoniana*, now considered a synonym of *C. × escarzana* (Moya et al. 2019), and a year later *C. × shaferi* (Dahlgren and Glassman 1959). Dahlgren and Glassman (1963) proposed hybrid status for *C. × textilis* because they noted some characters seemed to be intermediate between their parents: *C. hospita* and *C. baileyana*. Also, they



5. *Copernicia* × *textilis* near Siete de Noviembre, La Sierpe, Sancti Spíritus. Palm on the right is *Sabal maritima* with leaves removed for thatch. © 2016 D. R. Hodel.





6. *Copernicia* × *occidentalis* at the type locality near El Sábalo, Guanes, Pinar del Río. © 2017 D. R. Hodel.



7. *Copernicia* × *oxycalyx* and Milián Rodríguez Lima near Dumañecos, Las Tunas.  
© 2018 D. R. Hodel.



8. *Copernicia* × *dahlgreniana* at the type locality in savanna on the road to Lesca, Camagüey. © 2018 D. R. Hodel.



confirmed the hybrid status of *C. × vespertilionum* León (1931) because they showed that characters were intermediate between their parents: *C. gigas* and *C. rigida*. Finally, they showed a comparison of the possible natural hybrids between *C. hospita* and *C. macroglossa* as *C. × burretiana* and between *C. curtissii* and *C. brittonorum* as *C. × occidentalis*.

Muñiz and Borhidi (1982), without stating the reasons but supposedly based on Dahlgren and Glassman (1963), proposed new hybrid status for *C. × burretiana* and *C. × occidentalis*.

Verdecia (2014) proposed new hybrid status for *Copernicia × oxycalyx* (putative parents *C. baileyana* and *C. rigida*) while Verdecia and Verdecia (2021) summarized a comparison of these parents. Verdecia (2016) also described the new hybrid *C. × dahlgreniana* and summarized the comparison of their parents *C. cowellii* and *C. macroglossa*.

By definition, natural hybrids are typically infertile and do not

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9. *Copernicia × molinetii*, the only known photograph, by Brother Regis, from León (1931).

produce seeds, but this notion is not so in the case of the Cuban *Copernicia* where most hybrid combinations generally produce abundant seeds, which is deserving of future study.

*Copernicia hospita*, widely distributed in Central Cuba, is the most promiscuous of the Cuban species of the genus, and forms hybrids with five species of *Copernicia*, including the new hybrid proposed here (**Tables 1 and 2**).

Here the status change of *Copernicia molinetii* to the natural hybrid *C. × molinetii* (**Fig. 9**) is proposed according to the evidence in **Table 2** that shows the hybrid possessing intermediate characters of the two parents, *C. gigas* and *C. hospita*. The three taxa are growing together at the type locality of the hybrid.

***Copernicia* × *molinetii*** León, Revista Soc. Geogr. Cuba 4: 55. 1931 ‘*molineti*’ (pro sp.). *C. gigas*  
Burret × *C. hospita* Mart.

Type. CUBA. [Sancti Spíritus province, La Sierpe municipality], “*sabana no lejos del estero de las Guásimas, Mapos, Guasimal* (Santa Clara),” 24 Jun. 1931, *León 14912* (lectotype [first-step]: Dahlgren & Glassman 1963: 164, LS; lectotype [second-step]: designated here, HAC ex LS! (**Fig. 10**); isolectotypes, A 00028330, BH 000038937.1, BH 000038937.2, F 0078038 ex LS[CHI], F 279251 [photo A, n.v.], HAC ex EEAB5606!, HAC ex Roig5858!, MT 00116895, NY 00071179, NY 00071180, P 00725598, P 00725599, P 00725600, S-R-1232 ex LS, US 00087471 ex LS).

León (1931) designated *León 14912* as the type of *Copernicia molinetii*. In doing so he referred to a complete collection, thus creating syntypes, but did not note where specimens were deposited. Dahlgren (1936) did the same, while Dahlgren and Glassman (1963) designated as the type all duplicates of *León 14912* at LS, now considered as lectotype [first-step]. Here I designate HAC ex LS, as the lectotype [second-step] and designate as isolectotypes the 15 duplicates at A, BH, F, HAC, MT, NY, P, S, and US.

Dahlgren and Glassman (1963) corrected the original spelling error of the epithet *molineti* by adding another “i” to the ending to make it correct.

During 1931, when León collected several *Copernicia* in the southeast of the current Sancti Spíritus province, the area belonged to the municipality of Sancti Spíritus of Santa Clara province. At that time, to travel to the southwest of the current municipality of La Sierpe, which is the type locality of *C. × molinetii*, one first had to go to Guasimal by the Sancti Spíritus-Tunas de Zaza railway, or a local rural road, from there on horses to the Zaza River, which passed by “*patana*,” and finally again mounted on horses to Mapos and other towns to the east.



10. Lectotype of *Copernicia × molinetii*, León 14912 (HAC ex LS).

**Table 2. Characters of the hybrid *Copernicia × molinetii* and its parents.**

Characters	<i>C. gigas</i> Fig. 11	<i>C. × molinetii</i>	<i>C. hospita</i> Fig. 12
Height	15-20 m	7 m	8 m
Trunk diameter	to 52 cm	to 40 cm	to 30 cm
Petiole length	to 111 cm	to 50 cm	to 118 cm
Hastula length	12 cm	4-6 cm	4.2 cm
Lamina base in adult leaf	Cuneiform to nearly semi-orbicular	Orbicular or semi-orbicular	Orbicular
Segment quantity	50-60	62	56-72
Central segment length	165-215 cm	to 170 cm	to 115 cm
Stigmata <sup>2</sup>	lacking	present, prominent	present, not prominent
Fruiting rachilla length	to 13 cm	to 3.2 cm	to 2 cm
Fruiting rachilla diameter	3-3.5 mm	1.5-3.5 mm	to 3 mm
Flower length	2.5 mm	3.5 mm	4.5 mm
Flower arrangement	separate	adjacent	adjacent
Sympatric?	yes	yes	yes

<sup>2</sup>Stigmata are “silica cells, disposed next to vascular and non-vascular fibres” (Tomlinson (1990). Dahlgren and Glassman (1961) wrote, “the nature and distribution of stigmata are useful key characters...,” while Dahlgren and Glassman (1963) noted their presence and distribution for most taxa.

Verdecia and Verdecia (2021) considered *Copernicia × molinetii* as a synonym of *C. × oxycalyx*. Here I show that it is a different hybrid.

Only one photograph of *Copernicia × molinetii* is known. Brother Regis took the photograph and León (1931) published it (**Fig. 9**).

*Copernicia × molinetii* occurs where natural populations of *C. hospita* and *C. gigas* overlap, which is only in the south central part of La Sierpe municipality.

**Geographical Distribution.** CUBA. Province Sancti Spíritus (La Sierpe<sup>H</sup>).

**Biogeographical Distribution.** CUBA province, Central Cuba subprovince: sector Camagüeyicum (Sagüense<sup>H</sup>).

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**11.** *Copernicia gigas*, one of the parents of *C. × molinetii*, at Carenero, Siete de Noviembre, La Sierpe, Sancti Spiritus. © 2016 D. R. Hodel.





**12.** *Copernicia hospita*, one of the parents of *C. × molinetii*, just east of Camagüey, city, Camagüey, with *C. cowellii*. © 2016 D. R. Hodel.

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