Copernicia ekmanii in Haiti

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The conservation status of the Haitian palm *Copernicia ekmanii* is reviewed.

Copernicia comprises 29 species of Neotropical palms. Three species occur in South America, two in Hispaniola, and the rest are endemic to Cuba. Of the two Hispaniolan species, *C. berteroana* is widespread on the island, but *C. ekmanii* has a much narrower distribution.

The type specimen of *C. ekmanii* was collected by the extraordinary Swedish collector Eric Leonard Ekman (1883–1931). Ekman collected extensively in Cuba and Hispaniola, and from 1924 until 1928 he collected primarily in Haiti. On 28th March 1925, Ekman was in northern Haiti, and he collected a palm at "Presqu'île du Nord-Ouest, road Port-de-Paix to Jean-Rabel, coral reef at the mouth of Rivière Cabaret." Ekman wrote in his notes "I am not sure if this *Copernicia* is the same as the homme de paille [straw man] and from Tortue and the Môle. It ought to be, of course, but the pet. of the leaves has not the same indument as that from Tortue." The two places Ekman's note refers to are currently known as Tortuga Island and Môle Saint-Nicolas, both of which are not far from the type locality – Port-à-l'Écu – between Port-de-Paix to Jean-Rabel (Fig. 1). Ekman's palm was eventually described as a new species by German palm specialist Max Burret, in 1929, and was named *Copernicia ekmanii*.

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Dahlgren and Glassman (1963) published a monograph of *Copernicia*. In their discussion of *C. ekmanii* they cited three specimens – Ekman's original collection plus another from the same locality, and one from between Ennery and Port-au-Prince. In our opinion, the supposed occurrence from between Ennery and Port-au-Prince is likely to be based on a misidentification, and in fact *C. ekmanii* occurs only in coastal areas in northern Haiti. Dahlgren and Glassman also noted that it occurred on the Isle de Tortue, presumably based on Ekman's notes. The current status of this population is uncertain.

Since 1963 there have been a few more collections of *C. ekmanii*. In 1985 Tom Zanoni and colleagues collected it "4.8 km from Môle St Nicolas en la carretera a Bombardopolis"

1. A juvenile *Copernicia ekmanii* grows on the grass tussock savanna of the Presqu'île du Môle Saint Nicolas, 2014.

and in 1989 Andrew Henderson and Michel Aubry collected it from "road from Jean Rabel to Anse Rouge, near Abricots." The Zanoni collection represents the most interior population of the species in an area known as Habitation Morne Blanc. The Henderson and Aubry collection noted that the palm was cultivated.

In 1996 Joel Timyan, Charles Hubbuch and Suzanne Michal surveyed Môle Saint Nicolas for *C. ekmanii* (Timyan et al. 1997). Three populations were identified in the area: one near Côtes-de-Fer River northeast of town, the second on the western tip of the Presqu'île du Môle – across the bay and northwest of the town – and the third 6.5 kilometers southwest of the town of Môle Saint Nicolas, in a small fishing village called Cap-à-Foux. One of these was presumably the population that Ekman visited decades before.

On August 29, 2014, the first author along with Joel Timyan, visited Môle Saint Nicolas, this time in preparation for a book on Hispaniola palms (Fernández & Gottschalk 2017). They drove for six hours from Gonaives to Môle Saint Nicolas, with an overnight in Bombardopolis. Upon reaching their final destination early the next morning, Timyan guided Fernández to the two locations he had previously visited. The idea was to photograph *C. ekmanii* in its natural habitat, assess the status of this species and collect seeds for ex situ conservation. A sizeable population on the west end of the Presqu'île du Môle grew along the first marine terrace (Fig. 1). A few individuals could be seen growing inland above the cliff. The habitat was a mixture of grass tussock and thorn scrub and showed signs of accidental periodic burns due to charcoal production. Most *C. ekmanii* at this site were juvenile palms 2–3 meters tall that were just starting to form their characteristic skirt of dead leaves. Almost all exhibited fire scars at the base of their trunks, but they seemed to be resilient. Locals called them T*i Pay*, a name that had not been previously documented.

That afternoon, Fernández and Timyan walked from Hotel Boukan Gingette to Cap-à-Foux, the small fishing cove west of Môle Saint Nicolas. The trail, dominated by thorn scrub on karst, traversed several clearings with remnants of charcoal kilns. Large old growth arborescent *Consolea* and other cacti dominated the rest of the landscape. In one particular spot, they found recently cut *Cereus* cacti that were being harvested for their woody stems. That was Fernández's first encounter with cacti being used for charcoal production.

2 (top). The seven oldest individuals of *Copernicia ekmanii* at Cap-à-Foux Fishing village, 2014. 3 (bottom). Three of the most spectacular specimens with their characteristic skirt of dead leaves. Antillean palm-swifts can be seen flying around as they use the skirts for roosting and nesting, 2014.

Timyan and Fernández descended the cliff on the back side of Cap-à-Foux and noted seven spectacular specimens of *C. ekmanii* that stood tall above the village with their characteristic large skirts of dead leaves (Fig. 2). A swarm of Antillean palm-swifts (*Tachornis phoenicobia*) flew in and out of the dead leaves, which they use for roosting and nesting (Fig. 3). The

4. Only three of the oldest seven *Copernicia ekmanii* individuals (center) remain at the Cap-à-Foux fishing village, 2022

central three individuals clustered together right in the middle of the fishermen's shelters. The rest grew closer to the water's edge. As Timyan had already assessed in a previous visit, these were possibly the oldest *C. ekmanii* in the area. South of the cove, both researchers found a larger population of juveniles, most averaged 1–2 meters high. Their leaves were being harvested for thatch to be used on the fishermen's shelters.

In June 2022, Fernández, David Stephenson (Haiti National Trust) and Andres Miolan (camera operator) revisited northern Haiti as part of a project on a revision of the palms of Hispaniola. The goal of the trip was to collect tissue from all palms in the north, to assess the status of their populations and to film the expedition. Given the difficult socio-political situation at the time, the team was advised to take the northernmost coastal road from Cap Haitian to Port-de-Paix and from there to Môle Saint Nicolas. This route required a very good vehicle with 4×4 capability, and it took approximately eight hours to complete. On the way, Fernández noted a large population of the African Oil Palm (*Elaeis guineensis*) that was naturalized in the area along several streams and mountain slopes between the towns of Limbé and Petit Bourg de Borgne. No large-scale plantations of this species were present, although it is likely the species was introduced to this area during the 1940s when SHADA – an American company – was established to expand the production of rubber and other commodities during World War II. Other palm species along the road to Môle Saint Nicolas included *Bactris plumeriana*, *Roystonea borinquena*, *Sabal domingensis*, one lone individual of *Pseudophoenix vinifera* and *Coccothrinax gracilis*.

The morning after the team's arrival in Môle Saint Nicolas, Fernández, Stephenson and Miolan targeted first the Cap-à-Foux population of *C. ekmanii*. As soon as they started on the trail, they noticed that large plots of property along the coast were being fenced off west of town. Given that this is the preferred habitat for *C. ekmanii*, expansion and development of property along the first marine terrace poses a future threat to this palm species. The trail crossed cleared patches of thorn scrub and old charcoal kilns. The team missed the turn off for Cap-à-Foux by a couple of kilometers and had to use a drone in order to find the fishermen's cove. Upon arrival at Cap-à-Foux, Fernández immediately noticed that tragedy had struck (Fig. 4). Four out of the seven oldest *C. ekmanii* had been lost to a

5. Charred upper trunks indicate that the skirts caught on fire, 2022.

6 (top). Juvenile *C. ekmanii* south of the fishing village at Cap-à-Foux ravaged by fire from charcoal production, 2022. 7 (bottom). Fire-scarred juvenile *C. ekmanii* in the Presqu'île du Môle beginning to produce fruit, 2022.

fire which ravaged the fishing village in 2021. The skirts of dead leaves of the remaining three had also been lost to the fire (Fig. 5). The juvenile population south of the cove also exhibited recent evidence of fire. Many young palms were completely lost, while others that were less affected were sprouting new leaves (Fig. 6).

8. The island of Hispaniola, adapted from a map produced by the Jet Propulsion Laboratory at the California Institute of Technology (USA), with the populations of *C. ekmanii* marked in red.

That afternoon the team proceeded to the Presqu'île du Môle by car to check on the other population of *C. ekmanii*. More properties and expanded development along the coast north of the town were some of the changes since the last trip in 2014. Also, the old airstrip now had a partial fence and an unfinished terminal, all recent projects attributed to slain president Moise. The Presqu'île was mostly uninhabited in 2014, but by 2022, the team noticed a brand-new church and a small fishing village on the southern coast of the peninsula, close to a few individuals of *C. ekmanii*. The rest of the population on the western tip was in relatively good condition. Juveniles represented the vast majority at this location. Some of the older individuals did have inflorescences with immature fruits. Unfortunately, we were too early in the season for ripe fruits. Several trails cut through the thorn scrub vegetation, presumably so the locals can harvest the leaves for thatch. We were able to access the second marine terrace on a dirt road used recently to build a lighthouse. We documented a few individuals of *C. ekmanii* there as well (Fig. 7).

On the trip back to Port-de-Paix, Fernández, Stephenson and Miolan stopped by Port-à-l'Écu to check on a third population of *C. ekmanii* that had been first reported by Ekman in 1925 as the type locality and which was re-visited in 1996 (Timyan et al. 1997). A small house next to the beach with *C. ekmanii* leaves for thatch roofing was one of the first indicators that the species was still present. With a pair binoculars Fernández was able to see a number of individuals on the eastern end of the cove. Unfortunately, the team was unable to reach the site to assess the size of that population.

Taken together, we believe there are upwards of 2,500 individuals of *C. ekmanii* in the wild, all found in northwestern Haiti. We updated the Red List assessment for *C. ekmanii* (Théogène & Timyan 2018) with documentation gathered in the 1996, 2014 and 2022 expeditions, and the species continues to be categorized as Endangered (Endangered B1ab(i, iii, iv, v)+2ab(ii, iii,v); C1 ver 15.1). Môle Saint Nicolas has shown an unfortunate increase in threats and a significant decrease in the number of individuals of *C. ekmanii*. Land development along the coast, as the size of the town increases over time, will likely encroach on prime *Copernicia* habitat. Escaped fires from continued charcoal production along the marine terraces are a major threat to the species. Considering that most of the population in the Presqu'île are juveniles that still do not bear fruit (but remain vulnerable to fires), this could mean a steep decline in the number of individuals over a short period of time. In addition to this, access by land to Môle Saint Nicolas is very difficult, so obtaining seeds to establish an ex situ nursery for the species is a costly undertaking. Regardless, Haiti National Trust, a local NGO

with a good track record in bringing back endemic *Magnolia* species from extinction, is interested in exploring options for in situ and ex situ conservation programs, including the establishment of protected areas in this region of Haiti (Fig. 8).

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