

# Exploring for Palms in French Guiana

LARRY R. NOBLICK

Montgomery Botanical Center

11901 Old Cutler Road

Miami, FL 33156 USA

[larryn@montgomerybotanical.org](mailto:larryn@montgomerybotanical.org)

In this article, I describe a recent palm-hunting trip to French Guiana.

Except for the coastal region, most of French Guiana is largely uninhabited and in its natural state (Fig. 1), in spite of the fact that it was colonized by the French and other Europeans as early as 1624. Most of its estimated 400,000 residents live in the major coastal cities, like Cayenne with a population of about 250,000. According to botanical studies done over the years, there are about 73 species of palms. French Guiana is about the size of Maine with numerous low mountains, inselbergs (isolated, island-like, granitic outcrops) and an abundance of rivers and creeks. Much of the land has still not been explored botanically due to its inaccessibility. Because of the potential for new discoveries and the ease of obtaining permits to collect, this would seem the perfect place for botanists to flock to, except that it is part of the European Union and its currency is the Euro making everything expensive when compared with neighboring South American countries. Nevertheless the opportunity to explore a new part of South America and to collect new species attracted me in April and May 2012. For three weeks during the height of the rainy and fruiting season, I explored French Guiana.

Recommendations from Dr. Scott Mori, a New York Botanical Garden botanist, who has worked there since the 1980s, led me to stay at a small place outside Cayenne called the Emerald Jungle Village run by Dutch-born Johannes (Joep) Moonen and his wife, Myrjka, from Suriname, and it proved to be

a great place to start my trip. Just behind their lodging is a very nice nearly primary forest, with a well marked forest trail and several species of palms including *Astrocaryum paramaca*, *A. sciophilum*, *A. vulgare*, *Attalea maripa*, *Bactris campestris*, *B. raphidacantha*, *Euterpe oleracea*, *Mauritia flexuosa*, *Oenocarpus bacaba* and *Syagrus inajai*.

Armed with information from Jean-Jacques de Granville, who has worked in Guiana since the 1970s, Joep's organizational skills and excellent knowledge of trails and the help of Pierre-Olivier Albano and members of the local palm society, I was able to locate and see many different species. Joep helped me to explore the Kaw mountains, especially the Tresor Trail and Preserve (which years ago he helped design and build) and the botanically well-explored Piste de St. Elie area. With the help of the palm society, I was able to explore near Petit Saut, Bagne de Annamites, Savane Roche de la Virginie (an inselberg) and many other areas close to these. Joep and I also took a short flight into central French Guiana to explore the primary forests surrounding the isolated village of Saül, once a thriving gold mining community.

## French Guiana palms

A major portion of the French Guiana palm flora is well armed. Great care must be taken to collect the spiny genera of *Astrocaryum*, *Bactris* and *Desmoncus*. Even *Mauritiella* and *Socratea* (Fig. 2) have their own armature.



1. The vast, undisturbed rain forests of central French Guiana near Saül.

Since on this trip most of my collecting was done near the coast, I encountered only a few of the several *Geonoma* species found in French Guiana, such as *G. stricta*, *G. baculifera* and *G. oldemanii*. Many smaller *Bactris* species commonly fill the *Geonoma* niche in the forest understory, such as *Bactris aubletiana*, *B. gastoniana* and *B. simplicifrons*.

French Guiana has only two species in the genus *Syagrus*. The most common is a single, thin-trunked palm of rather unimpressive stature called *Syagrus inajai*. The other species, *S. stratincola*, is a rarely seen clustering palm of isolated inselbergs in the interior. It is difficult to mistake it for anything else because of its unusual, globose fruits with their grooved exterior (Fig. 3).

Of particular interest to me on this trip were the species of *Attalea*. One of the most commonly seen is the *Attalea maripa*, which formerly belonged in its own genus *Maximiliana* with male flowers possessing stamens that far exceed its petals. Glassman described four new acaulescent *Attalea* (*Scheelea*) species, but he may have been a bit too eager based on so few specimens. By contrast, Andrew Henderson may have been a bit too quick to synonymize everything into one species. The truth is probably somewhere

in the middle. I arrived too late for fresh flowers and too early for mature fruit. It is not surprising why there is so little known about the acaulescent *Attalea* species. Although individuals can be found in abundance in the forest understory and have the potential of producing both male and female inflorescences, very few produce flowers or have any indications that they ever have flowered. There just is not enough sunshine available in the forest understory to induce flowering. When flowers do occur, more than 90% are males (great for identification, but bad for seed collecting). Female inflorescences are a rare item indeed, because of their high energy cost and they probably need an opening in the forest canopy to be successful. Encountering mature fruit is rarer still, but when they do have fruits, they usually produce a lot.

Some of these acaulescent *Attalea* belonged originally to the genus *Orbignya* and all of the others belong to the former *Scheelea* genus. The *Orbignya* group is characterized by having all of the male flowers attached to one side of the inflorescence branches (rachillae) and the flowers have spoon-shaped (spatulate) petals. Not enough material has been collected yet to determine if there is just one species (*Attalea microcarpa*) as proposed by Henderson

(personal comm.) or if there are two, one with thin rachillae and smaller flowers which was misnamed *Attalea polysticha* because someone mistakenly thought that the flowers were attached all the way around the rachillae (which they are not) and *A. sargotii*, which grows on well drained soils and has much thicker rachillae with much larger, unilaterally attached flowers. The *Scheelea* group of *Attalea* have more cylindrical petals that are slightly tapered at both ends and the stamens are smaller or equal to the petals and is the most problematic group to understand. Although Henderson has placed them all in *Attalea guianensis* (Henderson, personal comm.), there are some differences I observed in the field in terms of their preference of habitat. Some grow on well-drained mountain forest slopes and never extend their populations into the adjacent wetter depressions close to the creeks and streams. Others grow only in poorly drained swamp forests or on the flood plains of creeks and streams and never grow up onto the adjacent well-drained forest slopes. That would seem to indicate that there probably is more than one species, but perhaps fewer than the four that Glassman proposed based on his meticulously collected measurements of the length of the male rachillae and size of the

male flowers in the few specimens that he had available to him.

### The Tresor Preserve

The Tresor Preserve is located in the Kaw mountains just east of Cayenne. The trail is well marked and maintained, but it does not contain a great diversity of palm species. Along this trail we saw the trunkless *Astrocaryum paramaca* and thin trunked *A. gynacanthum*. Both have fruits that split open at the tip and peel back displaying a yellow-coated ball (seed) center, begging for some creature to carry it off (Front Cover). There is also the menacing *Astrocaryum sciophilum*, whose slow steady growth makes it a common palm in many well-drained forested sites along with occasional *Bactris gastoniana*. Along the trail we also encountered an acaulescent *Attalea* with old fruit but which could not be identified for lack of male flowers. Close by, at the trail of the Piste de Caiman, there were more sterile acaulescent *Attalea* on a well-drained site.

### Piste de St. Elie

Piste means track or road and there are many roads that say that they go to places that they do not, and the Piste de St. Elie does not go to

2. The spines on the stilt roots of *Socratea exorrhiza*.







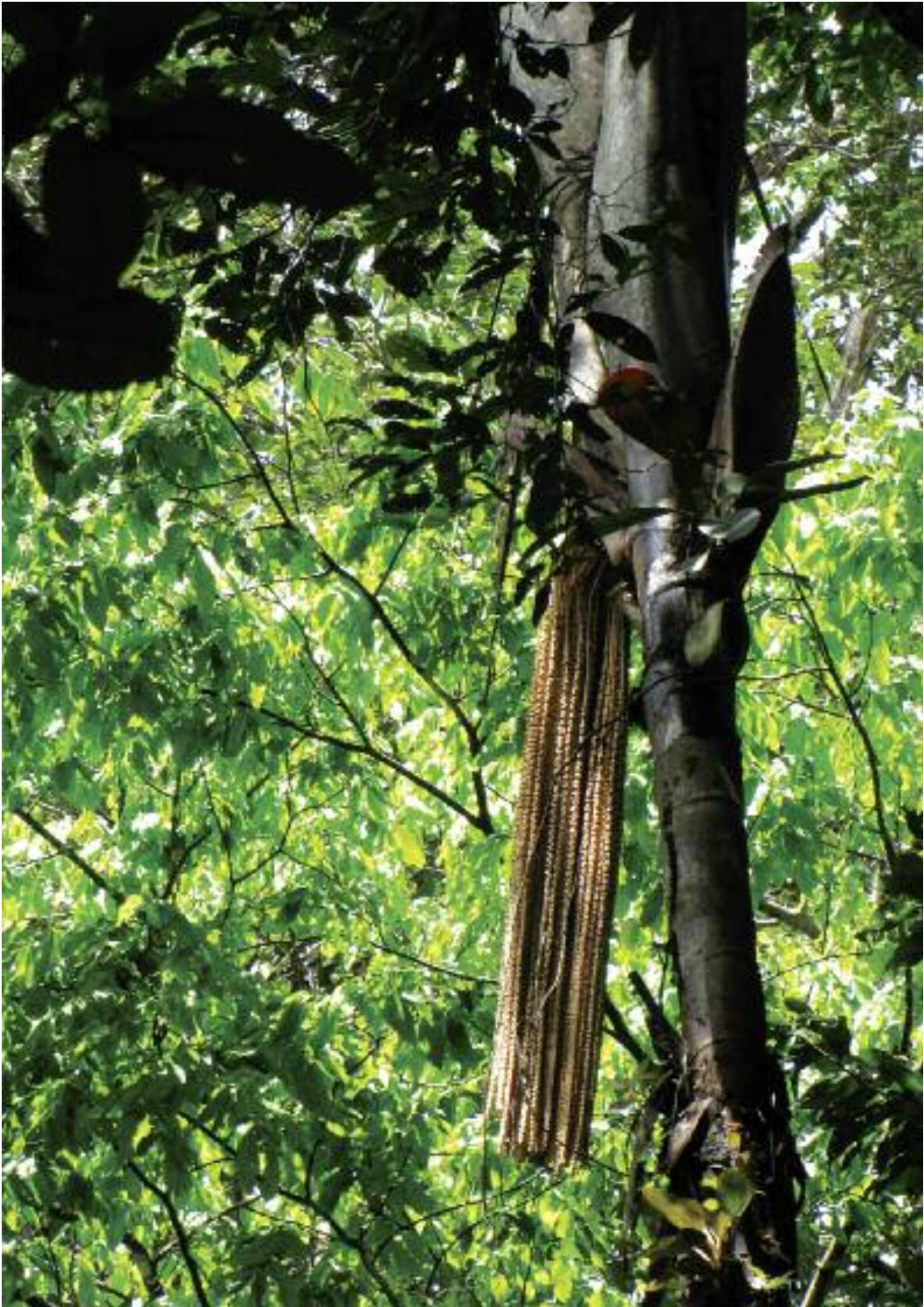
3. The longitudinally grooved exterior of *Syagrus stincola* fruits.

St. Elie. However, it is the site of a well-established trail and camp that have been used by the botanists from the Herbar de Guyane for many years. Sterile, acaulescent *Attalea* on well-drained soils were seen here. The trail also had a number of other interesting palms, like single stemmed species of *Oenocarpus*, *O. bataua* and *O. bacaba* (Fig. 4) and a *Geonoma* with strap shaped leaves, *G. oldemanii*. There was also *Bactris raphidacantha*, *B. aubletiana*, *B. simplicifrons* and *Astrocaryum sciophilum*. Although no palm collections could be made at the Piste de St. Elie, we found mature orange fruiting *Astrocaryum vulgare* (Fig. 5) at the edge

of a wet savanna on our return, and I was able to collect seed from several mother plants and make a spiny voucher.

#### *Asterogyne guianensis*

My first day out with Pierre Olivier Albano and the Ti-Palm society's palm enthusiasts was educational. Although *Asterogyne guianensis* (Fig. 6) has been thought to be a very rare palm and has fallen under the legal protection of the French Government, it has been found to be not so rare by the local palm society. I was led down a well-drained slope onto a large flood plain where there was a very large and healthy



4. The horse-tail-like inflorescence of *Oenocarpus bacaba* near the Piste de St. Elie.

population of the species, which the members have been carefully monitoring for several months. The palm appears to grow on a soggy flood plain. On the adjacent or surrounding

slopes, we passed *Geonoma maxima*, *Bactris aubletiana*, *B. rhipidacantha*, *B. gastoniana*, *Oenocarpus bataua* and several acaulescent *Attalea* (*Scheelea*) on well drained soils with



several producing immature fruit at this time. We then continued farther west to Route de Petit Saut (little rapids road) and there on another flood plain near Crique de Eau we saw *Bactris elegans* (Fig. 7), the rare *B. nancibaensis* (Fig. 8), *B. acanthocarpoides*, *B. acanthocarpa* var. *exscapa* (= *B. humilis*), *B. gastoniana*, *B. oligocarpa*, *B. aubletiana*, *Oenocarpus bataua* and more acaulescent *Attalea* (*Scheelea*).

### The white sands of Sinnamary

The soils close to Sinnamary are a coarse-grained white to gray sand probably from decomposing granite, and here we found *Attalea* (*Orbignya sagotii*-type) and some very healthy *Bactris gastoniana*, *B. oligocarpa*, *B. aubletiana* and my personal favorite, *Bactris constanciae*, with its red, spiky fruits that

5. The attractive, orange-fruited but dangerously spiny *Astrocaryum vulgare*.







6 (top). *Asterogyne guianensis* growing in habitat in a swampy depression. 7 (bottom). The elegant leaves and fruits of *Bactris elegans*.





8. The rare, endemic *Bactris nancibaensis* with its entire bifid leaves.

resemble “koosh balls” or rambutans (Fig. 9). It is a very attractive but rather odd palm fruit.

#### Trail to le Bagne des Annamites

The trail to Bagne de Annamites (Fig. 10) initially crosses a swamp forest with an abundance of acaulescent *Attalea* (*Scheelea*) (Fig. 11). It rained for most of the day producing flooded trails and streams. This was

the last day I hiked with dry feet in French Guiana. Palms seen along this trail were *Desmoncus polyacanthos*, *Syagrus inajai*, *Oenocarpus bataua*, *Bactris raphidacantha*, *B. acanthocarpa* var. *excapa*, *B. nancibaensis*, *B. aubletiana*, *Astrocaryum paramaca*, *A. sciophilum* and *Geonoma deversa*. Pierre Olivier claims that he has recorded as many as 18 palm species along this trail.





9. The red, spiky fruits of *Bactris constanciae*.

### Crique de Margarite

Near the Crique de Margarite, I visited the palm collection of Andres Billot. It was a fine collection; however, the palm that most interested me was a native acaulescent *Attalea* (*Scheelea*) that he had cleared around and that was now producing female infructescences. In the adjacent well-drained forest, I found the same species of *Attalea* with old male inflorescences. Initially, I thought that the unusually small male flowers (<3 mm) seen in the female inflorescence (Fig. 12) were unique to the female inflorescence, but after seeing and measuring those in the old male inflorescences, I discovered that the measurements were the same. Interestingly, this palm does not match up with anything that Glassman described.

### Savane Roche de la Virginie (the inselberg)

The next day we drove along Route Nacional 2 (RN2) east towards a granitic rock outcrop called Savane Roche de la Virginie, also known as an inselberg. Along the RN2, Pierre Olivier and his palm enthusiast friends pointed out a fast growing *Astrocaryum rodriguesii* (Fig. 13). It displays its fruit in the same attractive fashion

as *A. paramaca* (Front Cover) and *A. gynacanthum*. We also stopped at a forest near kilometer marker 52, where we saw *Geonoma baculifera*, *G. oldemanii* and *G. stricta*.

We continued on to kilometer marker 118 on the RN2 to the trailhead that would lead us towards the inselberg. I had slowly walked about the first half of this trail on an earlier trip with Joep, and we had seen *Bactris rhipidacantha*, *B. gastoniana*, *B. paramaca*, *Manicaria saccifera* and *Syagrus inajai*. We also saw a large group of flowerless acaulescent *Attalea* on well-drained soils.

On this trip, we went a lot farther passing a population of *Geonoma stricta* and *Astrocaryum rodriguesii*, and just before we reached the inselberg, we came across a healthy population of *Syagrus inajai*, which I collected. The trail continued up a steep incline to the inselberg, and as it began to rain, we finally descended to the inselberg's open rock surface (Fig. 14) only to have to climb up a wet, steep, treacherously slippery (algae-covered) rock face to reach the spot where we would have lunch. The inselberg was interesting but was not rich with palms. There were many species of orchids, aroids, Melastomataceae, Clusiaceae,





10 (top). Ruins of the former prison at Bagne de les Annamites. 11 (bottom). The swamp-loving acaulescent *Attalea* (*Scheelea*) of Bagne de les Annamites with L. Noblick.





12. Female inflorescence of an acaulescent *Attalea* (*Scheelea*) with small (<3 mm) male flowers.

etc. After spending some time exploring the inselberg, we all returned to the cars soaked in rain and sweat.

#### Saül

The next day I flew with Joep to Saül and into the well preserved, seemingly endless forests of

central French Guiana (Fig. 1). To and from Saül there are no roads. The muddy airstrip is its only physical connection to the outside world, other than the free public internet. At least three major trails can be explored near the village, and there are no paved roads. After all the rain, the trails, roads and airstrip were





13. The fast-growing and horribly spiny *Astrocaryum rodriguesii*.

muddy. All terrain vehicles (ATVs) are apparently the vehicle of choice, as we saw several people using them to meet family members at the airstrip. ATVs are indeed the most practical way of getting around Saül, and I thought that it would be the only vehicle we would see. However, as we waited at the airstrip, we were met by a bright red pickup truck, one of the few non-ATVs in town. This

one was owned by the fire department. One fireman helped the single baggage handler at the airport to load passengers' luggage into the truck and transport it to the city hall, along with the few passengers lucky enough to find space in his truck. The truck took its time in negotiating the slippery road to Saül from the airstrip. We picked up our backpacks at the city hall and hiked a short distance to our





14. The Savane Roche de la Virginie inselberg with its dangerously slippery granite slopes.

lodging, Les Carbets du Bord. Our sleeping quarters were open to the elements, and the building where we stayed also had a small kitchen, large dining area with several picnic tables for eating and preparing meals (or pressing plants). The sleeping area was located on a higher level and included two foldout beds with mosquito netting but was mainly designed for hanging hammocks. In the evening, the electric lights were run from batteries, which were recharged daily by solar panels. We were pleasantly surprised to learn that they even had warm water (solar-heated) showers. We made an advanced reservation with a restaurant in town, which was required since we would be their only guests. It did not take us long to familiarize ourselves with the town, which included the city hall, the post office, the church, the fire station, and the National Park office.

#### Hike to Eau Claire (Clear Water)

The next day, we set out for Eau Claire, the weather was good for most of the day, but ended in a torrential downpour, which occurred exactly when I was collecting and measuring a spiny *Astrocaryum*. Jean-Jacque de Granville had told us of a healthy population

of *Syagrus inajai* on both sides of the road that was about 7 km from Saül on the road to Eau Claire and we found the population just as he had described it, but it was well past flowering and fruiting. Only a few old seed were found from this population that we labored so hard to get to. Although about 32 species of palm have been recorded from the forests surrounding Saül (Mori, 1997), this particular track was not that species rich. Along the track we saw *Astrocaryum gynacanthum*, *Bactris paramaca*, *B. oligocarpa*, *B. acanthocarpa* var. *excapa*, *Oenocarpus bacapa*, *O. bataua* and *Socratea exorrhiza*. The gently sloping trail was not difficult, but its wet, sticky, and often slick clay surface offered many opportunities to slip and fall. We took our time walking towards Eau Claire, but the return was a non-stop two and half hour march. Unfortunately, the bottoms of my feet blistered from sliding around inside my wet hiking shoes. We saw spectacular trees along the way, and I found an impressive *Socratea exorrhiza* (Fig. 15) from which I gathered seed. Unfortunately, I could not voucher such a magnificent specimen as the spiny root cone (Fig. 2) was over 2 meters high and positioning the stem too far from the ground to reach and climb with the



equipment that I carried. That evening, we arrived in town late. We were unable to make a reservation at the restaurant and had to subsist on crackers, bread and cookies. At any

rate, I used the extra time to press the palm material that I had collected that day. The next day, we prepared to leave on the plane, rested up from our hike and had another leisurely

15. A magnificent fruiting *Socratea exorrhiza* between Saül and Eau Claire in central French Guiana.





walk around town. We saw the original bulldozer that they had flown into Saül during the early days to make the airstrip and town's roads. I learned that they airlifted the bulldozer in a few pieces at a time and then reassembled it there.

### Gallion

During my last week, I left early one morning to accompany Ludovic, a botanist, and his zoologist colleague Kevin to another large population of acaulescent *Attalea*. They had discovered this large *Attalea* population in the process of working on an environmental impact study. The first part of the trip was down what looked like a flooded logging road with logs and tree debris still jammed together along the roadside. It was a balancing act to climb over all of the debris and not fall into the muddy water, but luckily that only lasted for the first kilometer, then we crossed a flooded savanna with *Bactris campestris*. We proceeded down a flooded savanna road with the soft clay mud sucking at each footstep as the water deepened well past the tops of our boots, each step becoming a laborious effort. The first population of *Attalea* was the typical sort found in flooded swamp forest that I had seen in Bagne des Annamites. We labored on past this population, down another flooded road, across another savanna and up a moderate slope to some more muddy logging roads. In the low swampy depressions between the slopes was an abundance of the same *Attalea* that I had seen before. I am now convinced that all of these swamp forest-loving acaulescent *Attalea* (*Scheelea*-type) are all the same species.

### Type locality at kilometer marker 22 on National Route 2

The type locality for a species is the very place from which the original dried specimen (holotype) for that species was collected. There is no better way to understand a species than to return to its original collecting site.

Kilometer marker 22 on National Route 2 is just such a site. It is the type locality for *Attalea degranvillei* that Glassman had originally described as a *Scheelea*. Its habitat is not "mountain forest" as reported by Glassman (1999) but rather a poorly drained, swamp forest. It is the same palm and habitat as seen at Bagne des Annamites and Gallion. Therefore the mysterious swamp forest loving palm is *Attalea degranvillei*.

In the very near future, we hope to be able to determine the correct name for the acaulescent *Attalea* (*Scheelea*) of well-drained soils. It may be *Attalea guianensis*, as Henderson has proposed, or several species. I may be able to answer that question after my next trip to French Guiana in which I shall attempt to visit some of the other less accessible *Attalea* type localities.

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