



THE NEW YORK BOTANICAL GARDEN



Springer

---

Economic Botany of the Guahibo. I. Palmae

Author(s): Michael J. Balick

Source: *Economic Botany*, Vol. 33, No. 4 (Oct. - Dec., 1979), pp. 361-376

Published by: Springer on behalf of New York Botanical Garden Press

Stable URL: <http://www.jstor.org/stable/4254107>

Accessed: 26/01/2009 15:32

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=nybg>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).



New York Botanical Garden Press and Springer are collaborating with JSTOR to digitize, preserve and extend access to *Economic Botany*.

<http://www.jstor.org>

# Economic Botany of the Guahibo. I. Palmae<sup>1</sup>

MICHAEL J. BALICK<sup>2</sup>

The Guahibo Indians inhabit the eastern Llanos of Colombia and Venezuela. They are included by Steward (1948) as part of the Northwest Marginal groups occupying the periphery of the Northwest Amazon. Since much of their environment, the savannah, is unsuitable for agriculture, the Guahibo differ culturally from the tropical rain forest dwelling Indians of the Amazon Valley proper. They have developed as a nomadic hunting and gathering society.

Kirchhoff (1948) provides insight into the early Guahibo life style. Their first contact with Europeans in the 16th century was followed by missionary activity—not notably successful—in the 17th and 18th centuries. The ethnographic accounts of the missionaries furnish detailed information on the Guahibo. A large and powerful group, they hunted forest and savannah animals and gathered plant foods. Fishing and the capture of river animals was of lesser importance. They usually hunted with bows and arrows. A frequent technique involved men walking together through an area in a long line, eventually closing into a circle and capturing the prey.

As nomads, they required relatively simple dwellings of woven palm mats and hammocks of palm fiber. They made limited use of clothing. Some women wore small palm fiber aprons, and by 1889, they were reported to be making cotton loin cloths. Since the amount of personal and trade items that can be transported is a limiting factor among any wandering people, by necessity they had to become adept at making baskets, which they used as backpacks.

The Guahibo were skilled artisans, producing beautiful pottery. Other handcrafts included weapons, hammocks, grinding bowls, rafts and clothing. Musical instruments included rattles, panpipes and cane flutes. Trading between groups was frequent, using palm thread, palm fiber hammocks, calabash gourds and even captured slaves.

Morey (1975), in a comprehensive ethnohistory of the Llanos Indians, notes the importance of palms to the Guahibo for the following uses: raw or cooked fruits, *palmito*, fermented beverage, oil and starchy flour. They utilized palm oils, which were gathered from forest trees and traded with the Achagua in exchange for cultivated products. Rivero (1956) succinctly describes the importance of palms to the Guahibo:

This is the earthly paradise of the Goagibos [Guahibos] and Chiricoas; this is their delight, their universal larder and their everything; about this they think; this is the material of their conversations; about this they dream, and without this they could not enjoy life.

Following early contacts with Europeans, the Guahibo underwent immediate and permanent changes, although at first with much reluctance. Their numbers declined, customs and traditions altered, and today nomadism has been replaced by small permanent village units that attempt to exploit savannah and forest

---

<sup>1</sup> Submitted for publication February 6, 1979; accepted for publication March 10, 1979.

<sup>2</sup> Botanical Museum, Harvard University, Cambridge, Massachusetts.

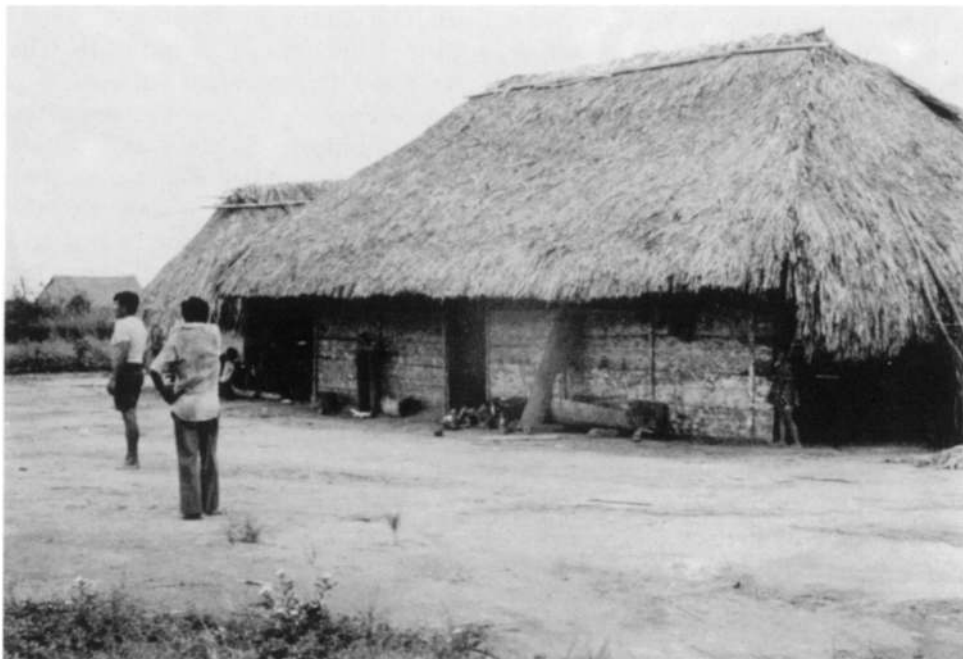


Fig. 1. Typical Guahibo house of the present day. Construction materials, for the most part, are obtained from palms.

lands. Needless to say, their traditional nomadic hunting and gathering activity, superimposed on the limited area of land that each family unit now occupies, has led to a great reduction in the numbers of once abundant food animals and forest resources that they formerly relied upon for survival. Prolonged contact with European settlers has transformed most Guahibo into sedentary cultivators of rice, plantains, bitter cassava and other crops. Some also raise domestic animals in an attempt to compensate for the lack of wild game.

A detailed ethnobotanical study of the Guahibo is needed. This paper offers a modest preliminary effort, stressing the palms. Information was gathered from Guahibos during two visits to the "Las Gaviotas" region of the Colombian Llanos. Where appropriate, my own observations have been supplemented by notes taken from cited authorities. For the most part the discussion is limited to those species present on the "Las Gaviotas" property, previously described in a floristic treatment by Balick (n.d.). Local common names in both Spanish and Guahibo follow the Latin binomial of each palm species. Enclosed in parentheses opposite each common name are the approximate local pronunciations to aid other researchers in future investigations.

#### TREATMENT OF GENERA

*Euterpe precatória* Martius, in *Palmetum Orbignianum* (1847) 10,t.8,t.18a,f.2.  
 Spanish: "Manáco" (Mah-NAH-ko)  
 Guahibo: "Manacáy" (Ma-nah-KAI)

This is a solitary palm 20 m tall, with a slender trunk 15 cm or less in diameter. The arching leaves are pinnate and grow to a maximum of 3 m in length. The small globose fruits are about 1 cm in diameter and dark purple when ripe.

The long, graceful leaves of this palm are used to cover canoes, protecting the occupants from sun and rain. An arched wooden framework is constructed and thatched with these leaves. Because of their small size and light weight, *Euterpe* fronds are superior for this purpose to other types of foliage. Formerly, the Guahibo were said to have used leaves of this species to cover the entrance to their provisional houses. Due to seasonal fluctuations of insect populations, the need arose during certain times of the year to sleep in small, tightly sealed dwellings. Huts were made of wild plantain leaves as well as *Jessenia* and other available palm leaves, and were probably constructed as pictured by Kirchhoff (1948). An insect-proof screen was created by weaving the many thin pinnae of *manacáy* together into a mat, and placing it over the hut entrance at night or occasionally during the day.

Today, the trunk of this palm is used for the construction of corrals. In addition, the succulent palm heart is eaten. The nutritional composition of the *palmito* of *Euterpe* is not available, but perhaps its food value may be assumed to be similar to that of the closely-related genus *Prestoea*. The nutritional composition found in the heart of *P. longepetiolata* is: Food energy: calories—26 (2,700); moisture—91.0%; protein—2.2 g (56); fat—0.2 g; total carbohydrate—5.2 g; fiber—0.6 g; ash—1.4 g; calcium—86 mg (800); phosphorus—79 mg (800); iron—0.8 mg (10); vitamin A value—trace; thiamine—0.4 mg (1.4); riboflavin—0.09 mg (1.6); niacin—0.7 mg (18); ascorbic acid—17 mg (45) (Leung, 1961)<sup>3</sup>.

*Mauritia flexuosa* Linnaeus filius, in *Supplementum Plantarum* (1781) 454.

Spanish: "Morange" (MO-REE-cha)

Guahibo: "Inójo" (In-OH-yoh)

This massive palm reaches a height of 25 m or more and is found growing in moist or swampy areas. The costapalmate leaves are huge, often 4 m or longer. These trees produce panicles of ovate, scale-covered fruits, about 6 cm in length.

Another thatch palm, this species is both durable and plentiful, and used to cover walls and roofs (Fig. 1). To harvest for this purpose, an entire young leaf is selected, petiole removed, and the segments split into several sections. These are individually hooked over roof crossbars, separating the segments into two groups woven alternately over and under the bars (Fig. 2). This thatch is highly esteemed, and will last approximately 2 to 3 years. Advantages over conventional tin sheeting include tempering the intensity of the sun's rays for a cooler habitation, while allowing smoke from the indoor cooking fire to escape. At the same time, *Mauritia* thatch also prevents water from entering the house during the frequent torrential rains. This Indian practice has been incorporated into the architecture of the Centro "Las Gaviotas" field station, where many of the buildings are covered with these leaves.

The fruits are used to make a fermented drink. These fall from the tree when

<sup>3</sup> Nutritional composition values given in terms of 100 g edible portion. Bracketed values are the recommended daily allowances for healthy adult males of ages 23–50 living in the United States and are included for comparative purposes only (National Academy of Sciences, 1974).

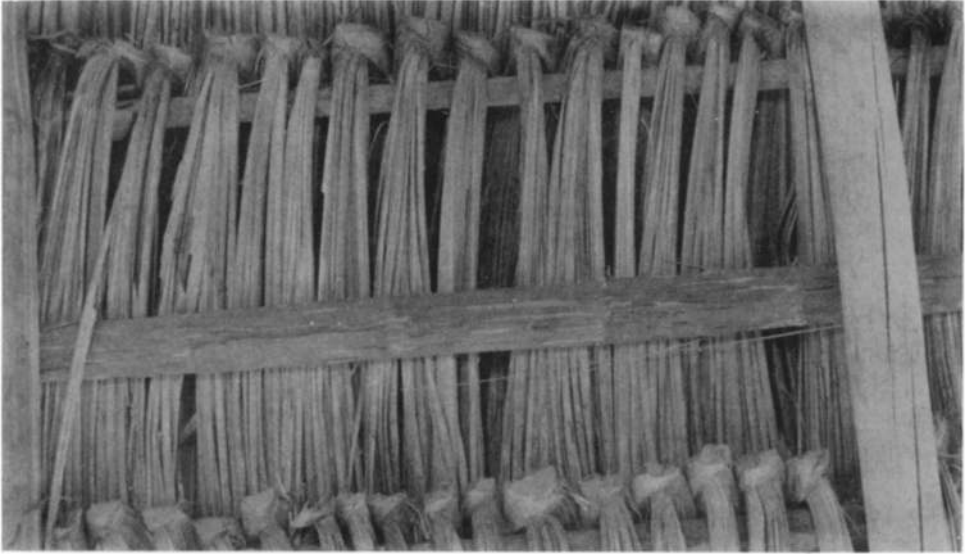


Fig. 2. Interior view of *Mauritia flexuosa* thatch used in many dwellings.

ripe, and are collected and mashed together to remove the epicarp scales and the stony endocarp. The resulting pulp is mixed with water. At this point, the drink can be enjoyed or made into a soup with other vegetables such as maize. If an alcoholic beverage is desired, the mix is left uncooked for 3 to 4 days, in the same manner as other alcoholic *chichas* prepared in South America. This fermented *inójo* brew is consumed during festivals, in the fields during planting season (a custom said "to make work easier") or at night after a day's labor.

*Mauritia flexuosa* is one of the abundant oleaginous palms native to this region that has tremendous potential as an important foodstuff.

The long, tubular leaf petioles of this palm, especially those of low growing young plants, are of value for several purposes. A small raft is made from them for fishing in a slow moving stream or lake when using *barbasco*, a fish poison. Quantities of these petioles are lashed together and the fisherman floats out to the middle of the water on this platform to spread the fish poison and scoop up the fish. The petiole's strength and light weight, especially when dry, provides a useful styrofoam-like material. The presence of millions of these palms along the streams and swamps of the Llanos, assures an ample supply, should an industrial application be developed. The petiole fibers could serve as a kind of packing material that might be locally produced and could provide cargo for supply trucks that otherwise return empty to urban centers.

Noted in a local village was an ingenious device for teaching young children to walk, constructed of these long petioles. Approximately 18 petioles were built up in a triangular pattern, one on top of the other, to form a three-sided corral, each side of which was about 1 m long by 40 cm high. The child was encouraged to walk within the confines of this device, securing himself to one side, and ambling along the perimeter in a training period simulating free upright movement. This construction was referred to as *penaevéto pigábo* (Fig. 3).

*Mauritia flexuosa* provided a little known fermented beverage, made from the trunk. According to Pérez and Gumilla fide Morey (1975):



Fig. 3. *Penaevéto pigábo*, a frame along which young children learn to walk, constructed from the petioles of *Mauritia flexuosa*.

. . . They would cut down palm trees and cut open their trunks in a number of different areas. When they thought the first tree was ready, they went back to it to find the trunk full of a clear liquid which had fermented to a suitable strength for rapidly getting drunk. They would then make the rounds of other cut palm trees until they had exhausted their prepared supply of palm wine.

When this palm approaches senility it falls over in the forest and is quickly attacked by weevil larvae that are eaten by the Guahibo foraging in the gallery forest. The larvae are called *aléri* and *simúto* by the Guahibo. The former is fat, white and 1 in long, appearing 2 mo after the tree falls. The latter is described as being much larger. It is reddish and appears in less time than *aléri*. The larvae are harvested only from mature fallen trunks; no trees are specifically felled for this purpose.

Trunks are sometimes collected and split in half for use as simple gutters to collect rain water in a drum for washing and drinking, especially in areas lacking easy access to streams or wells.

A final economically important use of the leaves was noted: as a source of fiber for making the *flecós* or woven ornamentation fixed to the borders of *cumare* (*Astrocaryum chambira*) hammocks (Fig. 4). These are sometimes kept for personal use or sold or traded for supplies.

*Desmoncus* sp.

Spanish: "Enredadera" (En-red-dah-DE-ra)

Guahibo: "Camuvé" (Ca-moo-VEH)

This is a vining palm common along streams and rivers. It grows up into the forest canopy by grasping onto surrounding vegetation with leaves armed with

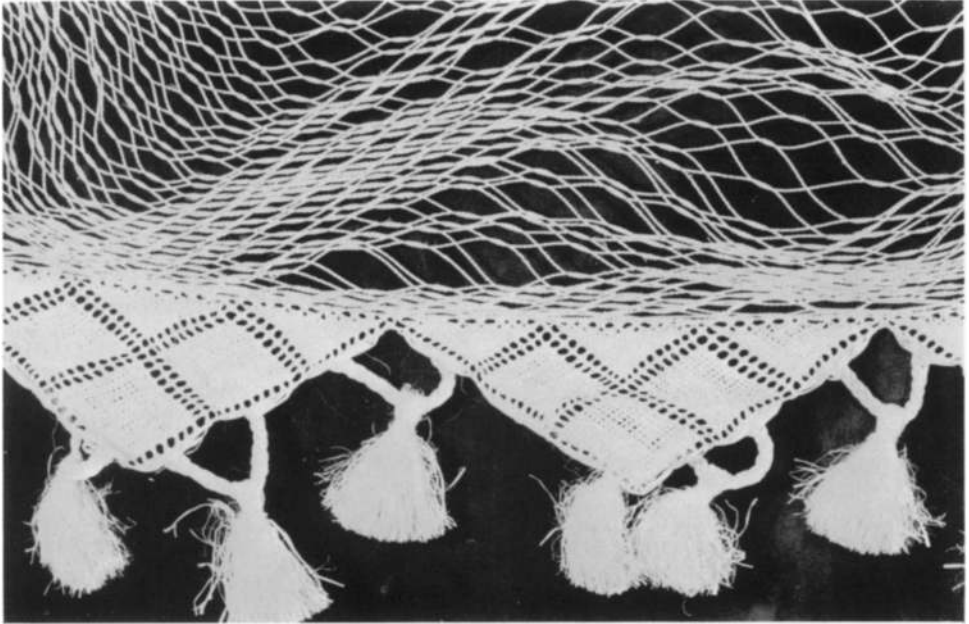


Fig. 4. The *flecos*, or woven ornaments with tassels, of a typical Llanos hammock, made from *Mauritia flexuosa*.

apical hooks. *Camuvé* is not utilized in this area. In parts of the Amazon Valley, it is important in basket making. Its long, pliable stem is employed as the frame for baskets used in sifting and straining foods.

*Socratea exorrhiza* (Martius) Wendland, in *Bonplandia* 8 (1860) 103.

Spanish: "Araco" (Ah-RAH-ko)

Guahibo: "Misibóto" (Mi-see-BOW-toh)

This stilt-rooted palm grows 15–20 m tall, with a straight trunk that is about 12 cm in diameter. The leaves are 2–3 m long and their green sheaths form a distinct crownshaft. The ellipsoid fruits are 2.75–3.0 cm long and ripen to an orange-yellow color.

This palm is used to provide wood for roof crossbars, walls and corrals. When it grows very tall, and reaches a sufficient age, it is sometimes used to make bows. The wood is resonant and thus acceptable for this specialized task.

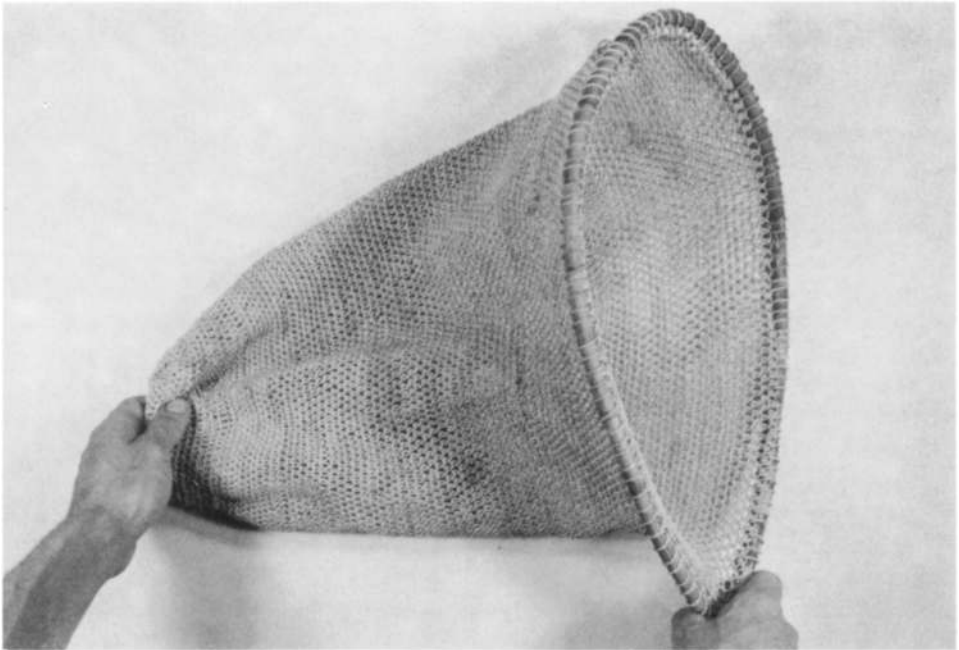
*Geonoma deversa* (Poiteau) Kunth, in *Enumeratio Plantarum* 3 (1841) 231.

Spanish: ?

Guahibo: "Vávava" (VAH-vah-rah)

This is a wide ranging species which exhibits great variation, depending on environmental conditions. It usually reaches only a height of 1–2 m, and has a thin trunk about 1.25 cm in diameter. A small coma of eight or so leaves are present on each plant.

The stems are used to make training bows for little children. This plant also furnishes the bars on which mosquito netting is hung, which probably explains its apparent disappearance from the forests of the "Las Gaviotas" station. The



**Fig. 5.** A fishnet made of woven palm fiber and secured with a sturdy frame made from the thin trunk of *Geonoma deversa*.

Guahibo use this stem, heated over a fire and twisted into a circle, as a frame for a woven fishing net of *cumare* fiber (Fig. 5). These nets are employed when fishing with *barbasco*, to scoop up the stunned fish as they float to the surface.

*Syagrus inajai* (Spruce) Beccari, in *L'Agricoltura Coloniale* 10 (1916) 467.

Spanish: "Churúbay" (Chew-ROO-bye)

Guahibo: "Oróboto" (O-ROW-bow-toh)

*Oróboto* grows to 10 m or more. The leaves are pinnate and measure about 2 m in length. The individual pinnae are set in groups of 1–4 per side along the leaf rachis. The inflorescence is 1 m long, and produces oblong, yellow fruits about 4 cm long.

The wood is used to construct the walls of dwellings and fences in corrals. Although thought to be inferior to that of *ataíto* (see *Jessenia bataua*), some use this wood in bow making. Certain animals eat the ripe fruits of this palm.

The Lapa, *Agouti* sp., is found near *oróboto* groves during the daytime and Peccari, *Tayassu* sp., at night. The Guahibo set traps or stalk their prey near this palm.

*Astrocaryum acaule* Martius, in *Historia Naturalis Palmarum* 2 (1824) 78,t.24,63,f.5.

Spanish: "Espina" (Es-PEE-nah)

Guahibo: "Matavicúli" (Mah-tah-vi-COO-li)

This palm is trunkless and produces upright, arching leaves about 4.5 m long. The inflorescences arise from the center of the leaf rosette and are covered by



hooded, heavily spined bracts. The ovoid fruits, about 3.0–3.5 cm long, turn orange upon ripening.

The mature seeds are used to cap the ends of the *silipu* for snuffing the narcotic *Yopo* (described under *Maximiliana maripa*). The outer husk and mesocarp are removed, the endocarp is cleaned, pierced longitudinally, and affixed to the bone tube.

*Astrocaryum* cf. *munbaca* Martius, in *Historia Naturalis Palmarum* 2 (1824) 74.

Spanish: “Cubarillo” (Ku-ba-REE-yo)

Guahibo: “Xaneeboto” (Tsa-KNEE-bow-tow)

This *Astrocaryum* has a slender trunk, about 5 cm in diameter covered with whorls of flattened black spines. The pinnate leaves are about 2.5 m long, and the panicle usually measures about 60 cm and is covered with small spines. There are no reported local uses of this palm. In the Amazon Valley, the fruits are eaten.

*Bactris* cf. *maraja* Martius, in *Historia Naturalis Palmarum* 2 (1826) 93,t.71,fig. 1.

Spanish: “Espina” (Es-PEE-nah)

Guahibo: “Xaneeboto” (Tsa-KNEE-bow-tow)

This is a caespitose species that often grows in groups of 15 or more. The thin trunk supports about 5 leaves per coma. Small panicles are produced on the stem and yield flattened-globose fruits about 1.5 cm in diameter. These purple fruits contain a sweetly acidic pulp which is eaten raw for thirst.

*Maximiliana maripa* (Correa de Serra) Drude, in *Martius Flora Brasiliensis* 3(1881)452,t.104.

Spanish: “Inajá” (In-ah-YAH)

Guahibo: “Naxárido” (Nah-HAR-i-bow)

*Naxárido* grows to 10 m or more, with a trunk diameter of 30 cm. The leaves are 7–8 m or more in length, with pinnae inserted in an irregular arrangement along the rachis. The fruits are formed on large panicles.

These fruits provide a valuable food to the Guahibo. When ripe they are picked from the tree, separated from the panicle and boiled in a pot of water for 10 min. The fibrous epicarp is then peeled off, and the remainder mashed to separate the pulpy mesocarp from the stony endocarp. This pulp is diluted with water and directly consumed as an oil-rich beverage, adding important fats to the diet. To prepare the coconut-like tissue inside for eating, the ripe panicle is cut into three to four sections, placed on glowing coals of a fire, and left to bake for 10–15 min. Each seed is then parted with a rock or machete, and the succulent endosperm is eaten. This separation process, removing the “meat” from the stony part, is a laborious task. It is often assigned the children while adults are engaged in other activities yielding a higher effort/benefit ratio. Both the pulp and the kernel are high in fat content. Eckey (1954) lists the following composition: % fat in kernel—60–67; % fat in pulp mesocarp—42.1. *Maximiliana maripa* is a notably useful species for oil and fat production, because of its great abundance throughout the region.

The pinnae of newly emerging leaves are used to weave floor mats and carriers for *cassava* (*Manihot esculenta*), and other heavy burdens (Fig. 6, 7, 8). This



Fig. 6. Carrying baskets of woven *Maximiliana maripa* leaves are used to transport cassava from the fields to the home. Here the roots are being peeled for processing.

was of special importance to the early Guahibo, a characteristically nomadic tribe.

Previous to contact with Europeans, ritual isolation of a young woman from the tribe during her first menstruation was common among South American Indian tribes. My informant was able to recall this practice during his childhood—about 30 years ago. When the Guahibo woman had her first period, a separate “room” in the family dwelling was prepared for her. This space was set off with woven mats of *M. maripa*. She remained in this room for approximately 8 days, never communicating with the other inhabitants of the dwelling. If she had to leave the house, it was in the company of an “ancient one” or older woman. After 8 days, she began to speak again, but continued to live in her separate room for about a month. From this point on, at each recurrence of her menstrual cycle, she dwelt in a small hut away from the others. These huts were also constructed with leaves of *Maximiliana maripa* and *Mauritia flexuosa*. When her menstrual flow began to diminish, the woman bathed herself and rejoined the others living in the communal group. The reason given for this practice of separation is that the curing power of the brujo or medicine man is much lessened in proximity to a menstruating female. In fact it is said that the medicine man is not able to operate at all in the same area with such a female.

The use of the hallucinogenic snuff *Yopo* is common among the Guahibo. The men were and still are known to use it to excess. The ground seeds of a leguminous tree (*Anadenanthera peregrina*) are snuffed through a Y-shaped device



**Fig. 7.** Demonstrating the use of the *Maximiliana maripa* carrying basket, secured by a headband and resting against the back of the bearer.

known as a *silipu* or *siripo* from a beautifully carved wooden plate known as *pâte* (Fig. 9). The snuff tube is constructed from the leg bones of an egret (*Ardea* sp.) or other local bird. The end inserted into the nostrils consists of either of two species of palm fruits, *Maximiliana maripa* or *Astrocaryum acaule* (see also



Fig. 8. Rectangular floor mats (in background) made from the young leaves of *Maximiliana maripa*, on which cassava cakes are placed after baking. Mats such as these are used to divide the house into separate "rooms" when necessary.

that species). Altschul (1972) describes *Yopo* as "serving for both pleasure and stamina" and states that the Guahibo are "never without it." Also an important item of commerce, *Yopo* was traded with the Piaroa for *curare*, an arrow poison. An early description of the preparation of this drug is found in Spruce (1970), where it is called *Niopo*.

According to Simón and Gillij, fide Morey (1975), the *naxáribó* palm was an important plant for salt making, especially among the Otomaco:

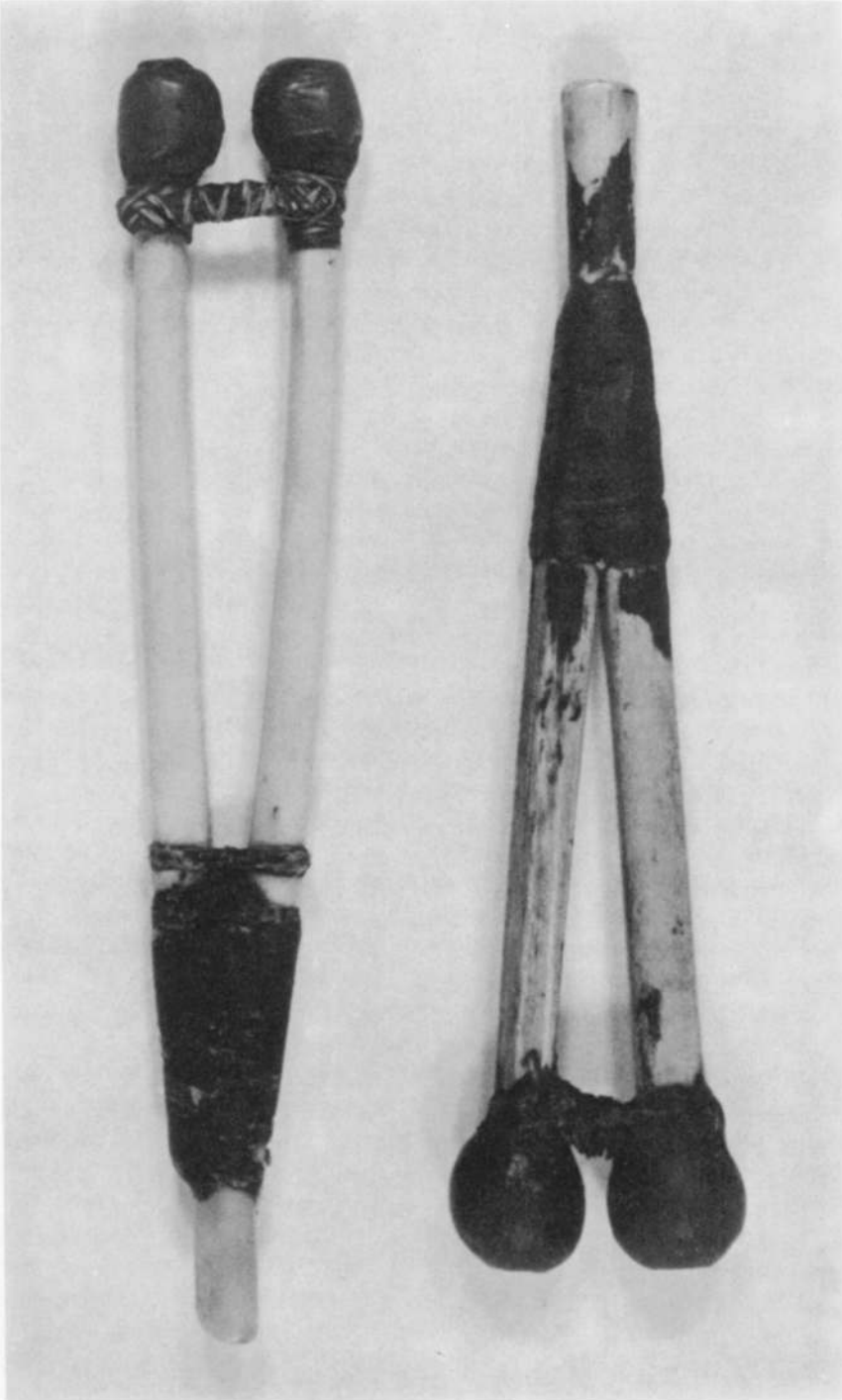
Their method was to burn the palm heart, put the ashes in a cone-shaped sack of palm fiber [*Astrocaryum chambira* ?] and add water. The sack was then hung over a container into which the filtered liquid dripped. In a short time, the liquid would congeal and become a fine white flour similar to salt. Other groups merely burned the palm hearts, mixed the ashes with water and cooked the mixture until it solidified into cakes.

*Jessenia bataua* (Martius) Burret, in *Notizblatt* 10 (1928) 302.

Spanish: "Seje" (SE-hey)

Guahibo: "Oxáe;" "Pevítsa;" "Ataító" (Oh-HEY); (Pe-VEE-tsa); (At-AYE-tow).

This palm reaches 15–25 m in height. When young, the trunk is covered with dark brown fibers and spines. These eventually fall away with age to reveal a slick, glossy trunk about 15–25 cm in diameter. The long arching leaves reach 6–8 m long, and are regularly pinnate. The fruits are ovate, up to 4 cm long and a deep purple color when ripe.



**Fig. 9.** Two examples of *Yopo* snuff tubes, capped with the polished endocarps of *Astrocaryum acaule* (right) and *Maximiliana maripa* (left).

*Jessenia bataua* is one of the more important palms of the region, and of use to all inhabitants. There are two kinds recognized by the Guahibo, based primarily on habit and use. The species consumed as a food is known as *oxáe* and apparently also as *pevítsa*. The fruits provide an oil with a taste almost identical to that of the olive. Preparation of this oil is simple. Ripe fruits are harvested and covered for a day or so in a pile to encourage further ripening. They are then steamed in water, and the pulp separated from the bony seed with a mortar. The steaming hot pulp is put into a woven basket press known as a *sebuacán* (the *típi-típi* of the Amazon Valley). Oil expressed by means of the strong pressure exerted by this device flows out into a collecting vessel to be clarified and bottled. Local uses for this oil include a remedy for tuberculosis, cough, asthma and other respiratory problems, as cooking or edible oil, or as a hair tonic.

The gathering of this oil and others from the genus *Oenocarpus* was an important occupation for the Indians living in forested areas of large concentrations of these trees. Palm oils were a valuable item of commerce to the trading economy of the Guahibo. In addition to an oil, a chocolate-colored *chicha* is prepared by macerating the fruits in water, straining out the seeds, and often adding crude sugar to the mixture. This beverage plays an important role in the Guahibo diet. During the palm's fruiting season, the people are said to be healthier and more robust, due to the frequent consumption of this nutritious and oily drink. The harvesting method used here is simply to cut the tree down. While this is a wasteful practice, a secondary product, the larvae of an edible palm weevil (*Rhynchophora palmarum*) is collected from the rotting stems about two months after felling. There has always been a strong demand for the oil obtained from *Jessenia bataua*. Thus the presumably once vast pure stands of gallery forest populations exist in only a fraction of their original splendor. The Centro "Las Gaviotas" has undertaken a conservation and nonexploitative utilization program to produce oil from this species and from those in the closely related genus *Oenocarpus*.

A further division of the *J. bataua* form *oxáe* is based on the color of the oily mesocarp, and local people distinguish a *blanco* (white) and *rosado* (reddish pink) form. This does not seem to be simply a different stage in the maturity of the fruits, as the Indians note that the trees bear consistently either one or the other of the different forms annually. The Guahibo recognize this difference but have no significant linguistic distinction between the two.

The other major form of *J. bataua* recognized by the Guahibo is known as *ataíto* (Fig. 10). It is thought to be a rare palm, growing very tall in sporadic locations throughout the forest. Features which distinguish it from *oxáe* are its height, thinner trunk, smaller quantity of fruit yielded, and characteristic red-colored inner stem tissue. Its identity is confirmed by chipping away the outer surface of the stem, to reveal a hard, brown wood with large numbers of fibrous vascular bundles. The circumference of the specimen examined was about 45 cm, with no apparent differences from *oxáe* other than those mentioned. This is a palm revered for its fine wood in bowmaking, and formerly also to make arrow points. The bows are strong and flexible. Arrows were made by carving the trunk wood into a thin, sharp sliver, with a series of barbs. Fig. 11 illustrates the shape of the tip. This was secured with *cumare* fiber to a cane cultivated especially for arrow making. The point would enter the animal (or enemy?) and catch on the



Fig. 10. The interior of a Guahibo dwelling. Note the hammock of *Astrocaryum chambira* fiber, the wall of an unrolled trunk of *Socratea exorrhiza*, and the hunting bow carved from *ataíto*, the wood of *Jessenia bataua*.

squared central portion. The arrow could then neither be pulled out or pushed through, and thus impeded the victim's movement, leaving a trail of blood for easy tracking and capture. Because of its smaller yield, *ataíto* is not harvested for oil or beverage.

*Oenocarpus bacaba* Martius, in *Historia Naturalis Palmarum* 2 (1823) 24,t.26,f.1-2.

Spanish: "Seje pequeño" (SE-hay pe-KAY-ño)

Guahibo: "Cupéri" (Ku-PE-ree)

This solitary palm grows to 10-15 m or sometime taller. The leaves are irregularly pinnate and up to 6 m long. The small, subglobose fruits are 1.75-2.5 cm long and turn a deep purple when ripe.

*Cupéri* is of use for its oil and beverage, having a similar taste and chemical composition to *Jessenia bataua*. The Guahibo distinguish this species from *J. bataua* by its thinner peduncle and smaller, rounded seed. This species is in greatest concentration in the Guacamayas area to the west, including Cumaribo and beyond.

*Oenocarpus multicaulis* Spruce, in *Linnean Soc.* 11 (1871) 142.

Spanish: "Seje pequeño" (SE-hay pe-KAY-ño)

Guahibo: "Macopáji" (Mah-ko-PAH-he)

This is a solitary or clustering palm reaching 8-14 m in height. The leaves are pinnate and a maximum of 2.75 m long. It is a palm widespread in the Amazon Valley.

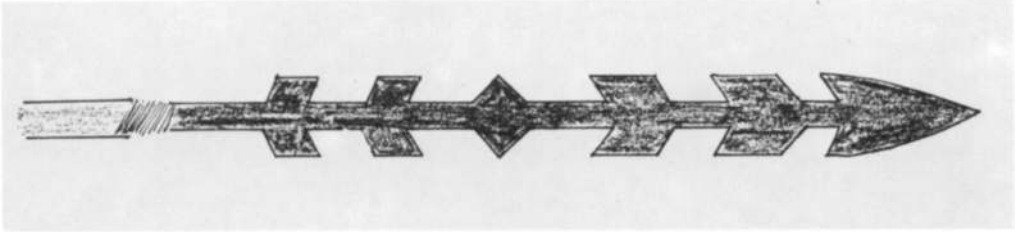


Fig. 11. A barbed arrow point made of ataito (*Jessenia bataua*) wood. (Rendered with the assistance of E. Vargas).

A beverage and occasionally an oil are extracted. The panicles are smaller than those of both *oxáe* and *cupéri*. The trees, however, produce fruit at a younger age than the other two species; in this area people say after three to four years. This would appear to be an advantage in any attempt to repopulate the gallery forest with economic plant species, if indeed a sufficient quantity of oil could be shown to be present in the fruits. The other important use of this palm is for its wood, which is the principal support in the construction of the framework of a dwelling. Indians and *campesinos* both use this palm, which in addition makes a good sliding gate for the corrals in which domestic animals are kept.

#### SUMMARY

The role of palms in the everyday life of the Guahibo is evident. They depend on this important family for much of their fiber, shelter, food and for other needs. The change in Guahibo life style over the past centuries has resulted in modifications of the local flora, and frequently in a reduction in the number of certain over-utilized palm species. It is vital that an attempt be made to halt the decline in the "value" of the forest. Studies must determine the species of most worth and a diligent effort be made to repopulate the gallery forests of this area with the kind of plants that once made the forest and its abundant palm flora both an "earthly paradise" and "universal larder" for the Guahibo.

#### ACKNOWLEDGMENTS

This paper is dedicated to three persons: Dr. Paulo Lugari C., whose conception of the "Las Gaviotas" development program has given hope to the peoples of the region and provided a working example for other areas; Dr. Magnus Zethelius, M.D., a physician whose care and personal concern for the Guahibo and other inhabitants of the vast Llanos area is daily demonstrated in the medical center of which he is director; Sr. Eutimio Vargas, a Guahibo who has shared with me his knowledge and deepest feelings about the plant lore and local flora. To each of these persons I am most grateful and I trust that in some small way this paper will serve as a token of my thanks and of the respect I have for them all. Sincere appreciation is also due to Dorothy Kamen-Kaye and Susan Marie Rossi of the Harvard Botanical Museum for their comments on the manuscript, to Dr. Harold E. Moore, Jr., for identifying some of the palm specimens, and to Dr. Augusto Acosta, his wife Dra. Maria Clavijo de Acosta and their entire family for the hospitality shown me during my stay in Bogotá. Funding for the field exploration involved in this work was provided by Sigma Xi-The Scientific Re-



search Society of North America, the Anderson and Atkins Funds of Harvard University and the Centro "Las Gaviotas." Duplicate specimens of the plants discussed in the text have been deposited with the Universidad Nacional de Colombia, Instituto de Ciencias Naturales; the Instituto Nacional de los Recursos Naturales Renovables y del Ambiente-INDERENA, and the Centro "Las Gaviotas." For the cooperation of all of these organizations, I offer my most sincere appreciation and thanks.

#### LITERATURE CITED

- Altschul, S. von R. 1972. The Genus *Anadenanthera* in Amerindian Cultures. Botanical Museum, Harvard Univ., Cambridge.
- Balick, M. J. n.d. The indigenous palms of "Las Gaviotas," Orinoquia, Colombia. Manuscript.
- Eckey, E. W. 1954. Vegetable Fats and Oils. Reinhold, New York.
- Kirchhoff, P. 1948. Food gathering tribes of the Venezuelan Llanos. *In* Steward, J. H., ed., Handbook of South American Indians. Vol. 4, pp. 445-468, Washington, D.C.
- Leung, W. T. W. 1961. Food Composition Tables for Use in Latin America. U.S. Gov. Printing Office, Washington, D.C.
- Morey, N. K. C. 1975. Ethnohistory of the Colombian and Venezuelan Llanos. Ph.D. Thesis, Dept. Anthropol., Univ. of Utah.
- National Academy of Sciences. 1974. Recommended Dietary Allowances. Washington, D.C.
- Perez, F. 1862-1863. Geografía física i política de los Estados Unidos de Colombia. Vol. 2, p. 362, and Gumilla, J. P., S. J. 1963. El Orinoco ilustrado y defendido. p. 439. Originally published in 1745; cited in Morey, l.c., p.221.
- Rivero, J. P., S. J. 1956. Historia de las Misiones de los Llanos de Casanare y los Rios Orinoco y Meta. Empresa Nacional de Publicaciones, Bogota. Written about 1730.
- Simón, P. Fr. 1963. Noticias históricas de Venezuela. Vol. 2, p. 119 (originally published 1627), and Gillij, F. S., S. J. 1965. Ensayo de historia Americana. Vol. 3, p. 70. Written between 1780-1782; cited in Morey, l.c., p. 83.
- Spruce, R. 1970. Notes of a Botanist on the Amazon and Andes. Vol. 2. Johnson Reprint Corporation, New York. Written between 1849-1864.
- Steward, J. H. 1948. Culture areas of the tropical forests. *In* Steward, J. H., ed., Handbook of South American Indians. Vol. 3, pp. 883-899.

---

Twenty-First Annual Meeting  
The Society for Economic Botany  
June 15-18, 1980  
Indiana University, Bloomington, Indiana

Sessions with research papers and a special symposium on Legumes.