Principes, 42(3), 1998, pp. 125–135

Palms and Amerindian Fishing in Amazonas State, Venezuela

FRANCISCO J. GUÁNCHEZ[1]

Servicio Autónomo para el Desarrollo Ambiental del Amazonas, Avenida Orinoco, Los Lirios, Puerto Ayacucho, Amazonas, Venezuela

GUSTAVO A. ROMERO

Harvard University Herbaria, 22 Divinity Avenue, Cambridge, Massachusetts 02138-2094, USA

Fishing has always been an important activity in most human societies, and currently provides close to 24% of the protein consumed by people worldwide (Sahrhage and Lundbeck 1992). It is particularly critical for tropical forest cultures (Clay 1990, Royero 1994). While fishing methods in marine ecosystems have changed dramatically in the last 50 years, in continental waters, however, fishing methods have not changed much, particularly in tropical regions. To quote Sahrhage and Lundbeck (1992), "...the method[s] of fishing have not, in principle, changed much over thousands of years. Most gear, such as hooks and lines, fish fences, traps and baskets, and various types of fixed and towed nets, are based on primeval types of fishing instruments...."

Palmae is one of the plant families most widely used in the tropics, particularly in the Amazon basin (Balick 1984, Corner 1966, Ortíz 1988). Palms are sources of food and materials for house construction and tool and handicraft making. Because they have fibrous, relatively straight, and flexible stems and petioles, as well as large leaves with numerous leaflets and abundant fruits, palms are the most important plant source of materials for making fishing utensils.

The present work is an overview of the role of palms in subsistence fishing. It does not intend to provide social or anthropological aspects for each of the materials, objects, and techniques described; but rather, tries to deepen our ethnobotanical understanding of the species of palms, the parts used, and the methods and ways in which they are used for fishing. We present information about fishing utensils and techniques in which the native palm species are directly or indirectly used by different indigenous groups from Amazonas state, Venezuela. This information has been derived from more than 10 years of field experience by the authors in the region, a period of time during which palms received special attention, primarily with the Piaroa, Puinabe, Guahibo, and Yanõmami Indians. The field data are complemented by a comprehensive bibliography.

Amazonas state, Venezuela

Venezuela's Amazonas state is situated between 0°40′ and 6°15′N and 63°20′ and 67°50′W. It occupies 180,145 km^2, an area about the size of North Dakota and roughly ten times the size of Switzerland. About 90% of its total area is occupied by forest and 8% by savanna vegetation. Roughly 45% of the state land surface is protected, including the Upper Orinoco-Casiquiare Biosphere Reserve that occupies 83,830 km^2, an area roughly 1.5 times the size of Costa Rica, and all tepuis within the state limits (Huber 1993). Geologically, Amazonas state is on the Guiana Shield and, phytogeographically, in the western Guayana province (Huber 1994).

Amazonas state has an intricate fluvial network characterized by large rivers such as the Orinoco, Ventuari, Ocamo, Padamo, Guainia-Rio Negro, Siapa, Atabapo, and Sipapo. One also finds lowland plains that are flooded most of the year, including large lake-like bodies of water

[1]Present address: L. H. Bailey Hortorium, 473 Mann Library, Cornell University, Ithaca, New York 14853-4301, USA.

1. *Attalea racemosa* (center) and *A. maripa* (above right) in a vegetation island on granite outcrops in northwest Amazonas state Photograph by F. Guánchez.

that are connected to the main course of rivers all year round or only during the high water season.

Amazonas state is rich in fish species, as it shares a large portion of the fish fauna of the Amazon River basin, the richest in the world. There are 14 orders, 56 families, 561 genera, and more than 2680 fish species represented (Smith 1981, Val and Almeida-Val 1995).

The rivers in southern Venezuela can be classified in three categories depending on the geological origin of the soils and vegetation of the terrain they drain. Black water rivers (e.g., Atabapo, Cunucunuma, Río Negro-Guainía, and Sipapo), clear water rivers (Cataniapo, Cuao, and Ventuari), and white water rivers (Orinoco). Black and clear water rivers usually drain old, oligotrophic soils and have low pH, with low values of suspended sediments and nutrient contents. White water rivers originate in the Andes

and, in contrast, have nearly neutral pH values, and high levels of suspended sediments and nutrient levels (Fitkau et al. 1975: 289, Weibezahn 1990). The different types of water are significant because they are indicative of the palm flora in a particular region. Moreover, since they differ in nutrient content and transparency, they also determine the variety of fish and their biomass, and therefore the fishing gear and methods employed by the native inhabitants.

During the rainy season, extensive forest areas are shallowly flooded. As the waters rise, many species of fish abandon the river course and migrate into the flooded forest to take advantage of newly available food resources as well as breeding habitats. Fishing is poor during this period, as fish are dispersed over a large area and volume of water (Goulding 1980, Meggers 1971). The logistics of fishing are complicated by the larger fishing area as well as by the submerged obstacles in the flooded forest. In contrast, during the dry season, fish are concentrated in a smaller area and volume of water, where they are more accessible to fishermen. Fishing efficiency increases accordingly.

The groups of Amerindians

The total population of Amazonas state is ~100,000 inhabitants, 50% of whom are Amerindians belonging to 14 ethnic groups: Yanõmami, Guahibo (Hiwi), Piaroa (Uwotuja), Yekuana (Ye'kuana, Maquiritare), Curripaco, Baré, Baniva (Baniwa), Piapoco (Tsatse), Sanema (Sanuma), Puinabe, Warekena, Hoti, Yabarana, and Panare (E'ñapa) (Signi 1988). The most numerous are the Yanõmami (13,000), Guahibo (9970), Piaroa (9964), Curripaco (2603), Ye'kuana (2381), Piapoco (1283), Baniva (1192) and Baré Indians (1136) (Oficina Central de Estadistica e Informatica (OCEI) 1995).

Fishing is a primary subsistence activity in some of these ethnic groups, such as the Makiritare (Wilbert 1966), Piaroa (Manzutti 1988, Wilbert 1966), and Puinabe (Triana 1985) indi-

2. *Euterpe precatoria* (left) and *Mauritia flexuosa* (center) in gallery forest in northwest Amazonas state. Photograph by F. Guánchez.

ans. In other indian groups, such as the Yanõmami, fishing is considered to be a secondary activity (Anduze 1982, Cocco 1972).

The current inhabitants of the upper Rio Negro (Baníba, Baré, Curripaco, and Guarequenas) depend on farming and fishing to provide most of their diet. In oligotrophic ecosystems such as those present in this area, fish are the main source of protein, even though fishing efforts are high and yields low (Clark and Uhl 1987); in the most isolated villages, fishing provides up to two-thirds of the total animal protein consumed. The absence of large fish in these areas forces fishermen to depend on the capture of smaller species, a situation to which they must adapt their fishing techniques.

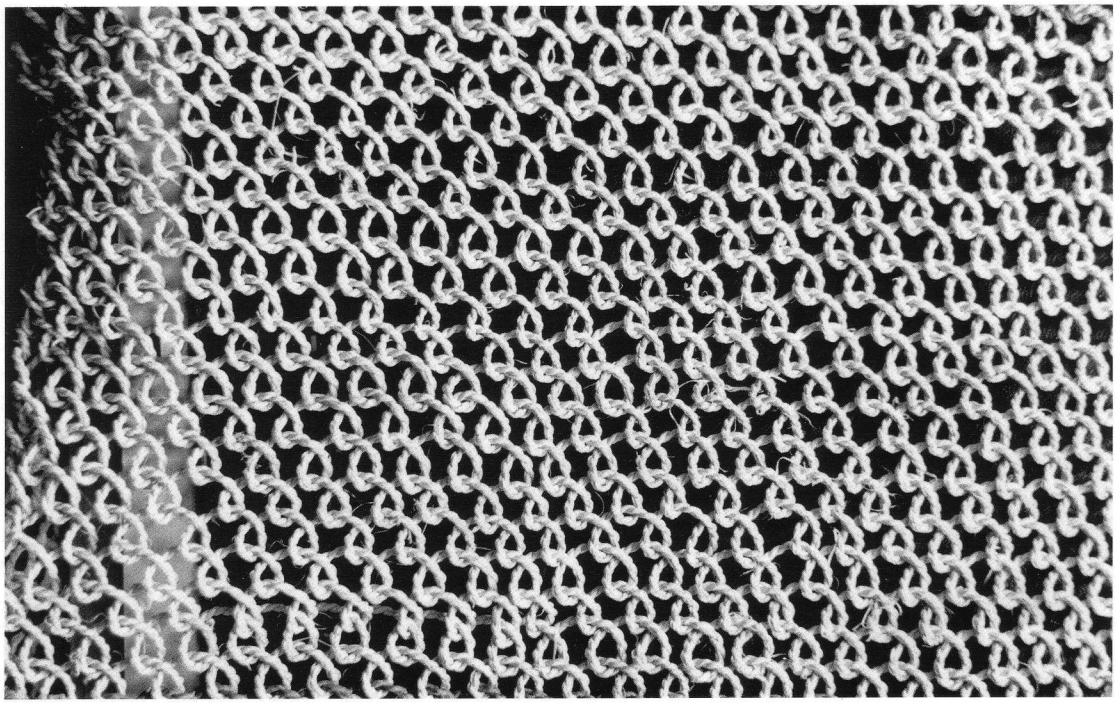
The most complete study to date of Amerindian fishing techniques in Venezuela was carried out by Manzutti (1988), who worked with Piaroa (Uwotuja) indians. This ethnic group lives mainly in forested areas. Manzutti described 17 different fishing techniques. Cocco (1972) and Finkers (1983) provided a detailed description of the social aspects of fishing among the Yanõmami. In this group, however, fishing is not a primary subsistence activity (Anduze 1982, Cocco 1972). Anderson (1978) complemented Cocco's work by presenting a complete description of the use of palms by the Yanõmami in Brazil, and Balick (1980) described the use of palms by the Guahibo in the Colombian llanos (Guahibo indians live primarily in savanna habitats), including some of their uses in fishing. Although both Anderson's (1978) and Balick's (1980) studies were conducted outside Amazonas state, they nonetheless provide information on the two largest indian groups of the state, as well as descriptions and common names that we believe are part of the indian culture.

Palms used

In Table 1 are presented the palm species, habitats, and parts of the palm used in fishing in southern Venezuela; and in Table 2 are presented the indigenous names of the palms.

Patterns of usage

Because of the fibrous nature of their tissues, palms traditionally have been sources of materials for many fishing utensils. Clark and Uhl



3. Woven hand net made with strings from the twisted epidermis of the youngest *Mauritia flexuosa* leaf. Photograph by F. Guánchez.

(1987) stated that the seven most important fishing tools in the upper Rio Negro are spears, spearguns, trot lines, drift lines, poisons ("barbasco"), set lines, and traps. Using these tools, the local inhabitants are able to catch >100 species of fish belonging to >24 families. Of the tools described by Clark and Uhl, palms are used for spears (bows and arrow tips), trot line (fishing line), drift line (buoys made from the petioles of *Mauritia flexuosa*, and fishing lines made from leaf fibers, both materials rarely used locally), in fish poisoning (hand nets made with strings from the twisted epidermis of the youngest *Mauritia flexuosa* leaf (Fig. 3), and rafts made from the petioles of same species), set and trot lines (string made from leaf fibers, now rarely used because of the availability of nylon), and finally traps, in which palm materials play the most important role. In addition, the authors have observed repeatedly Piaroa indians using *Oenocarpus* spp. leaves to wrap fish before they are smoked (Fig. 4). We have also seen smoked fish wrapped in this fashion being sold in Puerto Ayacucho, the capital of Amazonas state.

Baskets and weirs

The most important use of palm parts for fishing in Amazonas state (primarily stems, petioles, and rachises) is as the basic structural elements for making conical baskets, traps, and weirs. The species most widely used for this purpose seems to be *Iriartella setigera*. The stems of this palm are split lengthwise in segments 1–3 cm wide, and these are tied together with the roots of *Heteropsis* spp. (Araceae) to form a fishing fence (Delascio 1991, Rodríguez 1995; personal observation). Occasionally, rope made from the fibers of *Leopoldinia piassaba* are used to tie the stem segments. Shorter segments (30–50 cm) are often tied together to cover fish placed in the bottom of dugout canoes to protect the day's catch from the sun (personal observation). The sectioned petioles of *Attalea maripa* or *Leopoldinia piassaba* are also used to make fences, as well as baskets and traps. Short-lived damming and channeling fences can be made from palmate leaves of regularly arranged, rigid leaflets: the species most commonly used are *Attalea racemosa* and *Oenocarpus bataua*.

The weirs and fences used to direct the flow of fish are generally made from the leaves of *Attalea racemosa*, *Oenocarpus bataua*, or *Leopoldinia piassaba*; occasionally they are made from longitudinal sections of the stem of *Iriartella setigera*. These stem sections, however, are used primarily to make fish traps.

Traps

Fishing traps used by Amerindians of Amazonas are here classified as passive or active. Passive traps are the most widely used, and consist of a rigid structure into which the fish enters, attracted by bait; or guided by the current and by fences fixed to the river bottom. Fishing with these traps and fences is generally done by positioning in the mouth of the river, creek, or rivulet a fence or a "stopper" (Fig. 5) that can be as wide as 50 m (Manzutti 1988, Fig. 6); these are placed when a rapid drop in water level is expected. The fences are fixed to the bottom in such a way as to direct the flow of fish to one or more points where cage-like traps are set, so that fish can easily enter but cannot easily leave. Once trapped, the fish remain alive for several days, and are taken out as needed using an arrow or a spear.

The size of the fences and passive traps can vary greatly. They are placed in the mouth of creeks or medium-size rivers, in arms of larger rivers, or in flooded areas. In the last case, sticks and poles are used as fences (Triana 1985), and the passive traps consist of elongated baskets known as "cacures," in which small fish are trapped.

Active traps function through a tension-based mechanism released by a trigger. The tension is supplied by a bent branch or stem close to shore. In basket-based traps, the trigger is activated when a fish pulls the bait tied to the inside of a conical basket made from the stems of *Iriartella setigera* or petioles of *Attalea maripa*. When the tension is released, both the basket and the fish are pulled out of the water; the fish can be retrieved from the basket later. This type of trap is known as "wibrg" in Puinabe. Other active traps also take advantage of the tension provided by a bent stem or branch, but have only a piece of string and a baited hook. The string may have been made from palm fibers in the past, but nowadays it is made from artificial fishing lines. The basket-based trap has three important advantages over other active traps: it does not require a fishing hook; the fish is removed entirely from the water, where it is protected from other fish or other animals (usually aquatic arthropods) that could damage it; and basket-based traps have a high rate of success, whereas hooks

may miss, or in other traps, the bait may be consumed without activating the trap. Basket-based traps do have a drawback: they have to be checked at least twice a day to keep the catch from rotting. Active traps are used mainly in slow-moving waters or in flooded areas.

The basket-based active trap has been cited by Crevaux (1883), Koch-Grünberg (1971–1924, 1979), Triana (1985), and Rollero (1994), who described details of its workings. It is difficult, however, to understand the functioning of the trap based on these descriptions (including ours) alone, a limitation that prompted us to include here a detailed line drawing (Fig. 7).

Rafts and buoys

Guahibo indians use the petioles of juvenile plants of *Mauritia flexuosa* to make small rafts used to collect stunned and dead fish from small lagoons where they have poured fish plant poison known as "barbasco" (Balick 1980). Quantities of these petioles are lashed together, and the fisherman float on this platform to spread the barbasco and scoop up the fish.

Nets

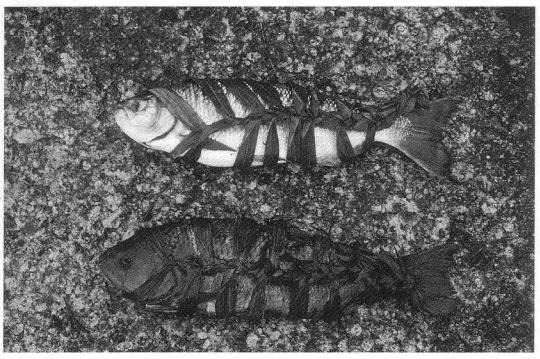
Indians use both hand nets and large, weighted fishing nets. Hand nets are used to capture small fish or to collect dead fish from bodies of water where indians have poured barbasco (Balick 1980, Rodríguez 1995). A hand net has two parts: the frame or support, and the net itself. The frame is made from a bent piece of wood (Signi 1988) taken from the aerial roots of epiphytic *Clusia* spp. or *Norantea guianensis* Aubl. The root is cleaned, and then heated over a fire and twisted into a circle. The two ends are tied together and used as the handle. The frame is sometimes made from flexible wood taken from the stems of *Geonoma deversa* (Balick 1980). Yekuana indians make the net from the fibers of a cultivated plant, "Kurana" (*Ananas lucidus* (Baker) Miller, Bromeliaceae). Guahibo and Piaroa indians, however, weave their hand nets with fibers obtained from the tender leaves of *Astrocaryum* sp., and *Mauritia flexuosa* (Fig. 3). Koch-Grünberg (1917–1924, 1979) found similar hand nets among other indian groups in the Amazon River basin.

Another type of fishing basket, known as Käwi'ta, is made from twisted fiber of "chiquichiqui" (*Leopoldinia piassaba*): it has the shape of a truncated cone and a handle made from the same material (Signi 1988). These baskets are 36 cm high and 20 cm in diameter (Signi 1988).

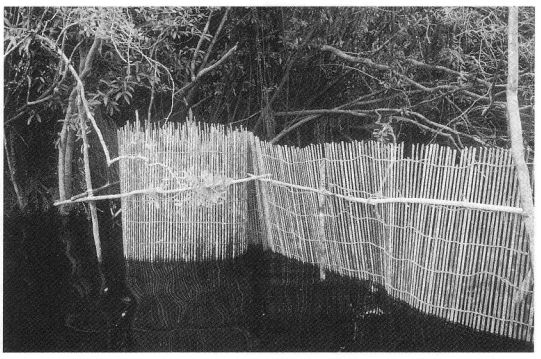
Before the introduction of synthetic fibers (e.g., nylon), large regular and casting fishing nets were woven with string made from *Astrocaryum* spp. and *Mauritia flexuosa*. Smith (1981) reported the use of nets made from "tucu" fibers (*Astrocaryum* spp.) in large ships navigating up and down the Amazon River; the catch was used to feed the passengers and the crew. Nowadays, however, these nets are made from artificial fibers.

Lines

In the past, as with large fishing nets, strings made with fibers of *Astrocaryum* spp., *Mauritia flexuosa*, and *Ananas lucidus* were used as fishing lines. Currently, however, they are rarely



4. Fish wrapped with *Oenocarpus* sp. leaves before and after smoking. The wrapping also serves to protect the fish during transportation. Photograph by G. Romero.



5. Fishing fence used as a passive trap or "stopper," made from split stems of *Iriartella setigera* with a cage-like fishing trap at one end of the fence. Photograph by G. Romero.

Table 1. Palm species and their parts used in fishing by Amerindian groups in Amazonas state, Venezuela.

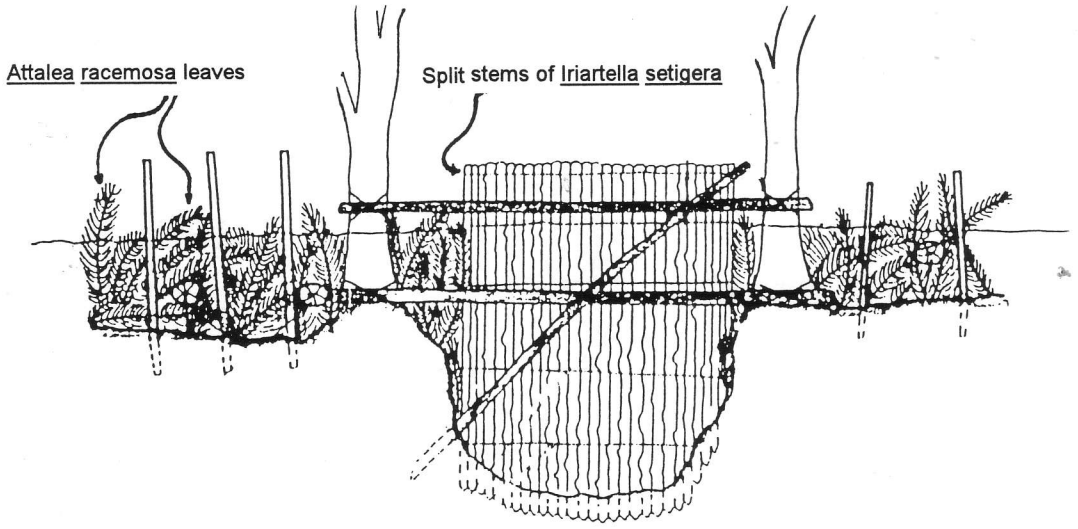
Species[1]	Subfamily, Tribe, Subtribe[2]	Habitats	Part(s) Used	Article(s) Made
Astrocaryum aculeatum G. Mey.	Arecoideae, Cocoeae, Bactridinae	Disturbed habitats around abandoned Amerindian settlements.	Fiber from young leaves	Fishing string
Astrocaryum chambira Burret		Disturbed habitats around abandoned Amerindian settlements.	Fiber from young leaves	Fishing string
Astrocaryum gynacanthum Mart.		Very common and abundant in lowland rain forest on terra firma.	Fiber from young leaves	Fishing string
Astrocaryum jauari Mart.		Very abundant and common along forested margins of larger rivers.	Fruits	Fish bait
Attalea maripa (Aubl.) Mart. (Fig. 1)	Arecoideae, Cocoeae, Attaleinae	Well-drained soils, in gallery forest, the periphery of savannas, and particularly abundant in disturbed habitats.	Petioles, larvae found in fruit	Fences, baskets, arrow tips, and fish bait for traps
Attalea racemosa Spruce (Fig. 1)	Arecoideae, Cocoeae, Attaleinae	Understory of open forest or in pasture lands in disturbed habitats.	Mature leaves	Fishing fences
Bactris gasipaes H.B. and K.	Arecoideae, Cocoeae, Bactridinae	Always cultivated and often found around abandoned indian settlements. This is the only palm cultivated by the indians of this region.	Stem wood	Bow and arrow tips
Euterpe catinga Wallace	Arecoideae, Areceae, Euterpeinae	Upper part of flood plains.	Fruits	Fish bait
Euterpe precatoria Mart. (Fig. 2)	Arecoideae, Areceae, Euterpeinae	Lower part of flood plains and by the side of rivers.	Fruits	Fish bait
Geonoma deversa (Poit.) Kunth	Arecoideae, Geonomeae	Understory of well-drained, dense lowland forests.	Stem	Frame for hand nets
Iriartella setigera (Mart.) H. Wendl.	Arecoideae, Iriarteeae, Iriarteinae	Understory of lowland forest <1000 m altitude.	Stem wood	Poles for fences, cacures, arrow tips
Leopoldinia piassaba Wallace	Arecoideae, Areceae, Leopoldiniinae	In dense stands in the upper part of flood plains in podzolic soils associated with Amazonian caatinga forest.	Fibers and leaves	Fishing string and fences
Mauritia flexuosa Linn. f. (Fig. 2)	Calamoideae, Lepidocaryeae	Widespread in the Amazon and Orinoco River basins, in saturated and/or seasonally flooded soils.	Petioles, fibers from young leaves, and fruits	Buoys, balsas, fishing string, and nets
Mauritiella aculeata (Kunth) Burret	Calamoideae, Lepidocaryeae	In large populations in the sandy flood plains of black water rivers.	Fruits	Fish bait
Mauritiella pumila Wallace[3]		Upper part of flood plains in savannas and open forest.	Fruits	Fish bait
Oenocarpus bacaba Mart.	Arecoideae, Areceae, Euterpeinae	Widespread and frequent in lowland, well-drained rain forest north of the Amazon River.	Stem and fruits	Bow and bait
Oenocarpus bataua Mart.		Widespread in well-drained and upper flooded plains of the Amazon and Orinoco basin <1000 m altitude.	Stem, leaves and bait	Bows, arrow tips,
Socratea exorrhiza (Mart.) H. Wendl.	Arecoideae, Iriarteeae, Iriarteinae	Locally frequent in small populations in lowland forests <1000 m altitude.	Stem wood	Bows and arrow tips

[1] Names based on Henderson (1995).
[2] Classification based on Uhl and Dransfield (1987).
[3] This is a species similar to *M. aculeata* but differs in several important features, such as being solitary, and having smaller stems and leaves.

Table 2. Common names of palms used in fishing in southern Venezuela.

Scientific Name/ Ethnic Group	Criollo	Baniva	Baré	Kurripaco	Guahibo	Panare	Piapoco	Piaroa	Puinabe	Warequena	Yanomami	Yekuana
Astrocaryum spp.	Cumare	Dumestri		Kumaria	Kumari	Amankayo'		Yarí	Kumaki		Akiwato, Uri Xohomo, Ai-amo, Mahã Kareshi	Kumadi, Wuaju, Zawara'-si
Astrocaryum jauari	Albarico											
Attalea maripa (Fig. 1)	Cucurito	Alitsi	Okalisi	Kwéterri	Najjarebo	We'sae		Wä'chä	Waibi	Okarisi	Kereshi kësi, Okolaxi	Washa
Attalea racemosa (Fig. 1)	Mavaco	Ekuru		Kuiapé	Mavako			Kusi, Ku'si				Mavako
Bactris gasipaes	Pijiguao	Wepi	Bubi	Pipirri	Jipiri			Pajare, Pajarí	Muri	Pipiri	Rasha, Lasa	Fijidi Jijiri
Euterpe catingae								Mana'ka				
Euterpe precatoria (Fig. 2)	Manaca	Mana	Manaka	Manáke	Manakai	Anku'		Neneä, Nene'a	Yot-pigot	Manaka	Waima, Maima1, Manaka késí	Wajü
Geonoma deversa	Molinillo										Wanama, Miyoma kë henaki, Misikiri, Pafa kë-si	Manasa
Iriartella setigera	Mabe, Cerbatana	Mawi		Máwi	Liwai			Yuruwäna, Yurua	Te yon		Yoroama	Yuduwa, Widima Iuruha
Leopoldinia piassaba	Chiquichiqui	Malama	Titía	Maráma	Sikisiki		Maráma	Marama	Maramaká	Malama	Reae kë-si	Madama, Marama
Mauritia flexuosa (Fig. 2)	Moriche	Tewi	Iseguí	Itéwi	Inojo	Ankayano	Idew	Warí		Itebi	Eteweshikë-si Liökoho	Ku'jai, Kuia Cuhuai
Mauritiella aculeata	Morichito							Uriá			Dorea	
Mauritiella pumila	Morichito sabanero							Siná				
Oenocarpus bacaba	Seje chiquito, Sejito, Macaba	Upeli		Púperri	Ojjou			Pjo ü puori	Yium		Haprua massi, Hokoma	Kuhëdi
Oenocarpus bataua	Seje grande, Kurumo	Yäu	Guaramo	Punáma	Ojjou			Bareu puori, Isoi	Wo	Yaro	Hoko kë maki' Kujedi, Konani Hoko	Kudai
Socratea exorrhiza	Macanilla, Cola de pava	Upa	Kuba	Púpa	Misiboto		Po'a	Poabä,	Kupa		Yei, Manaka	Kuhaka

Names adopted from Anderson (1978), Boom (1990), Civrieux (1957), Civrieux and Lichy (1951), Delascio (1992, 1991), Fuentes (1980), Lizot (1991), Masutti (1987), Signi (1988), Triana (1985) and notes of the authors.



6. Schematic illustration of the fishing fence used as a passive trap or stopper. From Mansutti 1987.

used because of the wide availability of synthetic fishing lines that are both stronger and resistant to rotting.

Weapons

Hard tissues of palms (stems and petioles) are used to make fishing weapons such as bows, bow strings, and arrow or harpoon heads (Anduze 1982; Cocco 1972; Koch-Grünberg 1917–1928, 1979). Bows are made mainly from the stem of *Bactris gasipaes, Socratea exorrhiza,* and *Oenocrapus* spp. (Anderson 1978, Cocco 1972). Bow strings are sometimes made from fibers of *Astrocaryum* spp. or *Mauritia flexuosa.* The preferred fiber, however, is extracted from the leaves of *Ananas lucidus* (Cocco 1972). Arrow and harpoon heads are made from the stems of *Astrocaryum* spp., *Bactris gasipaes, Iriartella setigera, Oenocarpus* spp., and *Socratea exorrhiza* (Anderson 1978, Cocco 1972).

Arrow tips are made from the stems of *Bactris gasipaes, Socratea exorrhiza, Iriartella setigera, Oenocarpus bacaba,* and *Attalea maripa.* They are tied to one extreme of a dry cane, *Gynerium sagittatum* (Aubl.) Beauv. (Poaceae) using a string made from the fibers of *Ananas lucidus* (Cocco 1972), "cumare" *Astrocaryum* spp. (Smith 1981), or "moriche," *Mauritia flexuosa* (personal observation).

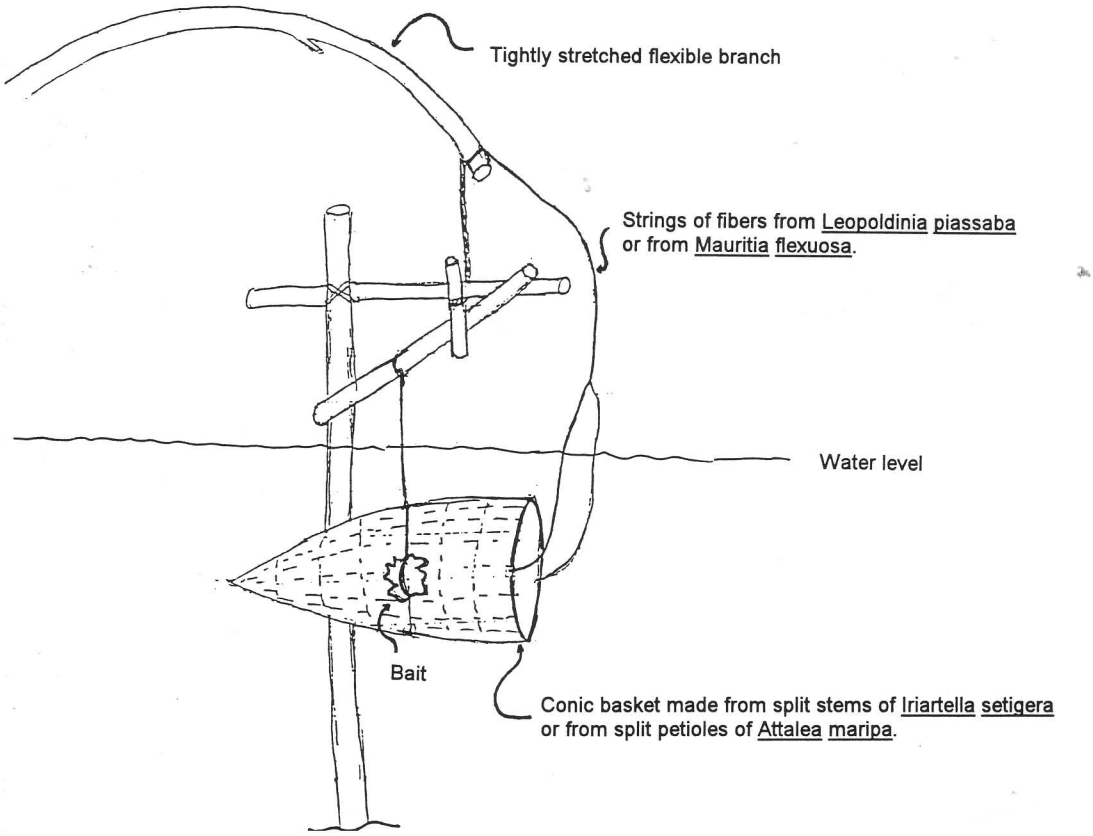
Among the Yanõmami, the arrow tips used for fishing are known as "rakukëmasi." They are sometimes polished and sharpened wood chips made from the petioles of *Attalea maripa*; they are apparently used to catch small fish (Cocco 1972).

Fish bait

The fruits of many palms, or larvae found therein, are used to bait hooks and fish traps (Rodríguez 1995; personal observation). Fish are important fruit-dispersing agents for palms: Goulding (1980) reported the presence of fruits of *Euterpe precatoria* and *Bactris maraja* in *Colossoma bidens*; those of *Astrocaryum jauari* in *Colossoma bidens, C. macropomum* and *Brycon* sp.; and those of *Oenocarpus bacaba* in *Brycon* sp. According to Goulding (1980), *Colossoma* and allied genera consume large amounts of palm fruits, and are perhaps their most important dispersal agents.

Discussion

The utilization of palm materials can be combined in different ways depending on the ethnic group and its habitat, including such variables as the water chemistry (clear, black, or white waters), and the water level and other physical characteristics (e.g., rising vs. falling water level or slow vs. rapid current) of the river(s) where they fish. Another important factor is the availability of suitable palm species. As Anderson (1978) stated, "In tropical South America, the



7. Schematic illustration of an active trap known as "wibrg" in Puinabe. Drawing by F. Guánchez.

general cultural levels are determined historically rather than by the local plant resources, for no fundamental culture traits appear to depend directly on the botanical environment. Tropical South American indians show exceptional ability to discover substitutes wherever a vegetal species is lacking."

Thus, as the "ideal" palm species become scarce it may be replaced by another, often less-suitable species. Therefore, although we cite the traditional or most commonly used palm species for a particular piece of fishing gear, the reader must keep in mind that it might occasionally be made from other species of palms—or even of other plant families, particularly other monocots (e.g., Aracea, Marantaceae, and others).

Currently, most indian groups in Amazonas state (including those that have been traditionally nomadic) are settling down in towns and villages serviced by government agencies. This process may have been triggered by the desire of the regional and national governments to provide services to indian communities. The price tag for such services is much lower for sedentary than for nomadic indian groups (Signi 1988). Signi (1988) points out that, in the case of Guahibo indians, fishing has become more and more important as they become settled in permanent villages, particularly as game animals and other sources of protein are depleted in the surrounding habitat. This may be a general tendency in the region; hence fishing may become one of the most important subsistence activities in Venezuela's Amazonas state.

Acknowledgments

S. Madriñan, P. L. Beer-Romero, L. M. Campbell, and particularly the editors of *Principes*, N. Uhl and J. Dransfield, kindly provided invaluable comments on early versions of this manuscript. The assistance of E. Camico, H. Escandell, C. Gómez, E. Melgueiro, I. Dorantes, R.

Dorantes, and P. Piñate in Venezuela, and the financial and logistic support of the L. H. Bailey Hortorium, the Harvard University Herbaria, IPS, MIRT, PREBELAC, SADA-Amazonas, TFAV, and VEN are gratefully acknowledged.

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