The Use of Palms by the Barí Indians of the Maracaibo Basin

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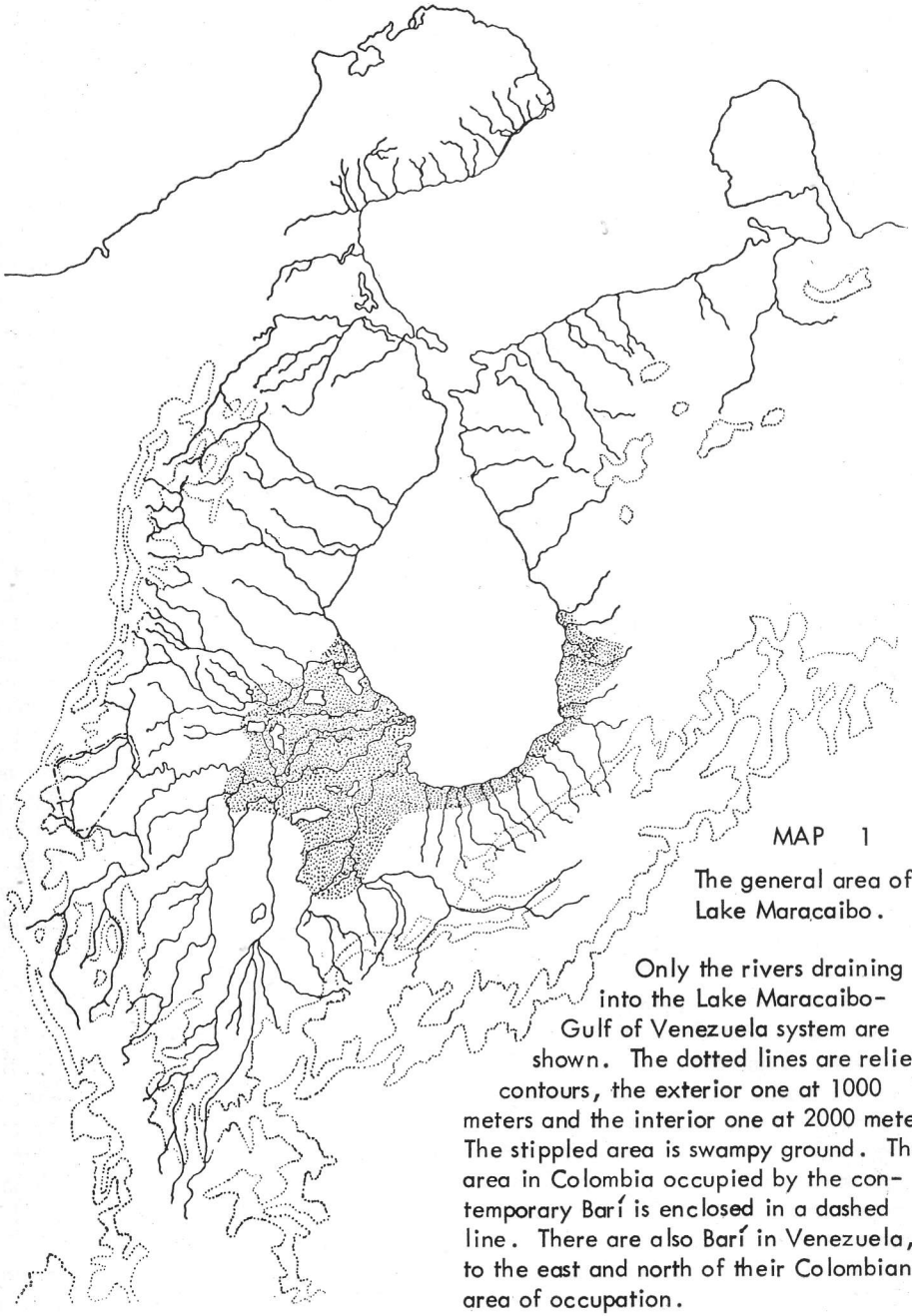
The Barí are a small tribe of slash-and-burn cultivators who inhabit the tropical rain forests of the southwesternmost lobe of the Maracaibo basin. I did anthropological fieldwork with the Barí between January 1970 and December 1972. Their homeland, sometimes called Motilonia in reference to the Spanish name for the Barí, *Motilones*, is bisected by the border between Colombia and Venezuela. The location of the area is shown on Map 1, and rainfall data are given in Graph 1. The average yearly temperature is about 27 degrees Centigrade, and the monthly fluctuation from this mean is only about a degree. Altitude ranges from 25 meters above sea level to an upper limit (within the general area of Motilonia) of over 2000 meters. Nevertheless, as will be pointed out below, the Barí do not establish permanent occupations above 600 meters.

These people cultivate sweet manioc (*Manihot esculenta*) as their major crop; bananas (four cultivars of *Musa*) are of secondary importance. Minor crops include avocados, pineapples, sweet potatoes, yams, sugarcane, peppers, and (perhaps a recent introduction) squash. Cotton is also cultivated.

This high carbohydrate garden is supplemented by fish, mostly *Prochilodus reticulatus*, the *bocachico*, in order to yield a diet adequate in protein during most of the year. Wild game is also hunted, and as will be seen below, there is yet another source of protein to which the Motilones can have recourse when hunting and fishing fail. In addition to cultivated crops, the Barí make extensive use of the wild vegetable products that can be obtained from the rain forests of their environment.

Of all the flora of the forest, palms are probably the most significant family for the Barí. The following genera are listed as occurring in the Zulia region of the southwest Maracaibo basin (just across the Venezuelan border from Colombian Motilonia) by the Venezuelan Ministerio de Agricultura y Cria (Veillon 1961: Cuadro 5): *Euterpe*, *Jessenia*, *Manicaria*, *Maximiliana*, *Sabal*, and *Scheelea*. In the Colombian section of the region are also noted (Morelo 1971: 16) *Oenocarpus* and (Rochels and Rincón 1971: 51–2) *Copernicia*, as well as (Neglia and Hernandez 1971:1:62) *Socratea* and *Aïphanes*. To this list we can add *Geonoma* (cf. Braun 1968:54), and probably a good many others. Some of these others were important enough to the Barí that I made an effort to photograph them but did not collect botanical specimens. These additional palms were tentatively identified by Dr. Robert Read of the Smithsonian Institution, who cautioned that my photographs were not sufficient to make an unequivocal identification in all cases. Nevertheless, he offered two additional genera, *Bactris* and *Astrocaryum*. The total list of 15 genera from a single family (some of them like *Geonoma*, containing dozens of different species) gives some idea of the floristic richness of the vegetation of Motilonia. Such is especially the case when it is recognized



MAP 1

The general area of Lake Maracaibo.

Only the rivers draining into the Lake Maracaibo-Gulf of Venezuela system are shown. The dotted lines are relief contours, the exterior one at 1000 meters and the interior one at 2000 meters. The stippled area is swampy ground. The area in Colombia occupied by the contemporary Barí is enclosed in a dashed line. There are also Barí in Venezuela, to the east and north of their Colombian area of occupation.

that the region has barely been studied, and that of the palms alone there are probably several more genera waiting to be found.

Dugand (1961:138–40) reports some interesting observations concerning the altitudinal tolerances of various palms. Of those that concern us here, *Jessenia*, *Oenocarpus*, and *Bactris* "thrive most abundantly below 2000 feet," or are "usually lowland-inhabiting genera," while *Astrocaryum* is restricted to these lower altitudes. Only *Euterpe* and *Geonoma* have really wide altitudinal ranges, and *Scheelea*, while it may reach above 4800 feet, has its main realm in "the ferest and open woodlands of the lower zone." It is thus plain that the only zone in which the association of palms that are most important to and most heavily exploited by the Motilones can be found in abundance is the lowland tropical forest, below 2000 feet (approximately 600 meters), which is also the upper altitudinal limit of Motilón dwellings. (I am not suggesting that Barí and palms are coextensive because of the total reliance of the former on the latter. There are a number of reasons for the unwillingness of the Barí to go over 600 meters for any prolonged stay. What is significant here is that 600 meters is a boundary for so many living creatures.)

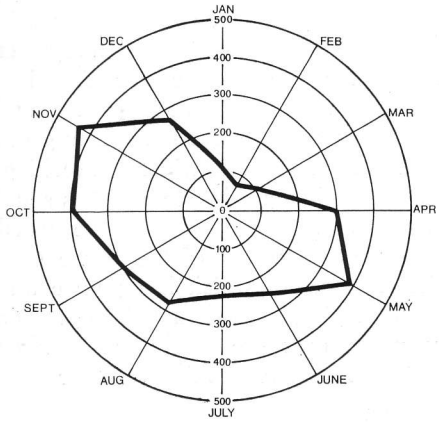
Be that as it may, it happens that palms are extraordinarily important to the Barí, and a healthy percentage of the genera just enumerated is actually used by them in one way or another. A summary of the ways in which a particular species is utilized will help to orient the discussion of the species itself.

The leaves of *Geonoma* are used to thatch houses. All species of the genus used by the Barí are small, understory palms. When young they are stemless and appear to be nothing more than a few small, pinnate leaves springing up from the ground. The pinnae are wide with respect to the size of the whole leaf—a typical leaf might be about 30 centimeters long by 30 centimeters wide with pinnae six or eight centimeters in width—and do not taper or fold together as they approach the rachis. In addition, the entire leafstalk, both petiole and rachis, is flexible enough when green to be bent double without breaking. *Geonoma* thus yields a leaf that is small enough and flexible enough to be folded into the latticework of the frame of a Barí house, but which has pinnae that lie flat and are broad enough to provide complete coverage of an area when several leaves are folded together in a bunch.

Braun (1968:8–9) observes that it is probably the abundance of *Geonoma* palms, rather than their other properties, that accounts for their popularity as roofing material. (The Waika Indians of the Orinoco basin also thatch their houses with *Geonoma*, yet, "the leaves of *Geonoma* species are by no means very durable.") It is the fact that they may be acquired in great numbers that makes them desirable. Braun estimates that 100,000 *Geonoma* leaves are needed to thatch a Barí communal house. While I was in the field, a photojournalist, Peter Frey, observed and photographed the construction of a large communal house across the river from the mission at Iquiacarora. He took notes not only on the quantity of materials used in construction but also on the time the women spent in fetching the leaves. From his figures it is possible to derive an estimate for the number of leaves used in the house and for the size of the area from which the leaves were collected.

Frey computed that far in excess of 100,000 leaves were used in the construction of the house. He observed that the women who were collecting the leaves were never gone for more than two hours in gathering their materials. Moreover, they did not cross the river which was only a few hundred meters

Graph I. Rainfall in Motilonia (millimeters)

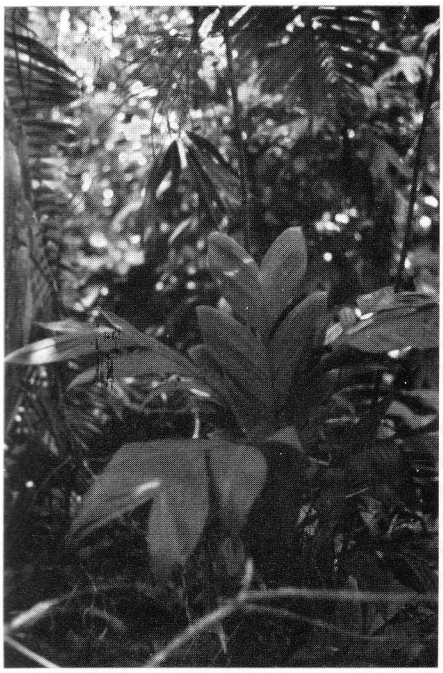


away from the house. The area in which they were collecting, then, was at most a semicircle whose radius was, at a generous estimate for the amount of ground covered in an hour on jungle trails, five kilometers. Most of the *Geonoma* that are picked for use in house thatching have only a half dozen or so leaves. Thus, even for Braun's lower estimate of 100,000 leaves per house, there must have been over 400 *Geonoma* plants per square kilometer to provide the necessary material.

However, Frey figured that more than 750,000 leaves went into the thatch of the house he was observing, and that is the house to which the collecting radius estimates pertain. Frey's figure is probably quite correct for the house he watched being built. Therefore, a more probable estimate for the number of *Geonoma* palms is 3,000 per square kilometer. While this figure must include a large number of different species, it is still impressive for a single genus to achieve such abundance in the highly diverse tropical rain forest. A more qualitative idea of the ubiquity of *Geonoma* spp. can be gained from the fact that the Barí word for *Geonoma, soaira,* is also the generic word for "leaf."

Another palm genus that is common, though by no means so omnipresent as *Geonoma,* is *Bactris.* The species used by the Barí is cluster stemmed and relatively small for a palm tree, having stems three or four centimeters in diameter and four or five meters tall. The stems are lavishly decorated with vicious spines that make backing into a *Bactris* an experience that never grows dim. The spines are sometimes used opportunistically as toothpicks, and the sweet fruits are occasionally eaten, but it is the stems that are the major useful product. From their iron hard and very springy wood are made the small bows that the Barí use for all sorts of small animal hunting—from vermin like snakes to small birds and various kinds of fish. One particular species, *Bactris major,* is known from near the Barí area (Braun 1968:38), and it is probably this species that accounts for most of the members of the genus used by them. *Bactris* apparently grows quite fast. I once saw a clump of *Bactris* among the second growth invading a Barí field that was in exceptionally bad need of weeding. They were a good four meters tall, yet, judging from the rest of the successional flora in the field, they were not more than a few years old.

Still another palm used for its wood is the large *Astrocaryum.* The species used by the Barí is tall and solitary, and shares the characteristic of the genus of having spines every bit as nasty as those of *Bactris.* The wood of the particular *Astrocaryum* species used by the Barí is the material of the large bows used for serious hunting (large birds and mammals), of the long spears used for fishing, and of the arrow points for the bird and barbed arrows. Because so many barbed arrows are made during the course of a year, for use as ceremonial trade items as well as weapons, a great deal more *Astrocaryum* wood is used by the Barí than



1. A species of *Geonoma* in the forest of Motilonia.

Bactris wood. My impression is that this disparity is not entirely compensated for by the greater size of the *Astrocaryum* tree. That is, there is a heavier exploitation of *Astrocaryum* than *Bactris*, in terms of numbers of individuals cut down per year. On the one occasion that I observed the felling of an *Astrocaryum* for wood, some of the faintly sweet "pith" in the center of the split trunk was removed for munching on, as something somewhere between a snack and a piece of chewing gum. As far as I am able to determine, *Astrocaryum* is widely used by indigenous groups in South America for fiber—taken from the leaves—but has not been reported as a source of bow wood (Perez Arbelaez 1956:567–8; Dugand 1961:142; Braun 1968:32; Dugand 1972:65). A Barí man once told me that his bowstring was made from *Astrocaryum*, although at the time I believed he was speaking loosely about the whole bow, and just happened to be touching the string. Another fiber is used much more commonly for bowstrings, that taken from the leaves of *Aechmea magdalenae*, a relative of the pineapple. Finally, Motilón large bows may be made occasionally from some of the larger, solitary members of the genus *Bactris*, which are well known among other indigenous groups for this use, and which may be similar enough for the purposes of the Barí that they are lumped together under the same word used to identify *Astrocaryum*.

I was told by the Barí that the canelike leafstalks (petiole plus rachis), which are split open, scraped free of inner pith, and used in segments one-half to one centimeter wide to weave mats, come from immature *Oenocarpus* trees, which we shall consider below as an important food source. However, when these leafstalks are picked, the tree from which they come is so immature that there is nothing to be seen of it but clusters of leaves coming out of the ground, making reliable identification impossible. Given the Barí's sometime practice of oversimplifying their explanations, I prefer to suggest the possibility that *Oenocarpus* also provides mat-making materials, rather than state this as a fact.

Moving now to palms exploited primarily as sources of food, we can take up these species in order of least to most important. As a preliminary matter, it is interesting that heart of palm, which can be obtained from many species, is sometimes eaten by the Barí, but always as a by-product of another activity. They are well aware that the embryonic leaf tissue is edible and in fact tasty, but I never observed them to cut down a palm tree simply for the purpose of getting heart of palm. However, if in the course of clearing ground for a field they had to chop down a young palm with a heart of reasonable

2. A felled specimen of the *Oenocarpus* used by the Barí.

size and accessibility, they would hack it out and bring it home for dinner.

With respect to palms exploited for their edible fruits, one general problem is the interface of ripening time with actual consumption. Tropical plants in general are less than synchronous in their flowering and fruiting cycles, and individuals may respond to influences, such as parasite cycles, that are far less uniform than whatever seasonality may be present. In addition to the problem of the spread around the mean fruiting time exhibited by different trees, there is the allied problem of the length of time the fruit stays on the tree. Aside from edaphic factors, which may affect the speed of ripening, there is the whole question of what other animals besides man may harvest a particular fruit crop. Compounding the above caveats is the fact that the availability of more favored resources may cause the Barí to ignore a particular palm fruit even though it is available.

All of this is to say that although my field notes are quite specific as to when the group of Barí that I was living with did eat a particular palm fruit, the fact that the group did *not* eat those fruits at some other time does not mean very much. They might have been locally unavailable due to some factor (microclimatic differences, a local concentration of seed predators, early overexploitation by the Barí, etc.) that did not influence their availability only a few hours walk away, or they might have been present but unused due to an abundance of more preferred foods. To determine the relationship of consumption to actual broad-area availability would require broad regional data on ripening times that I simply do not have. Therefore, the following statements as to the times of major consumption of a particular palm fruit must not be taken to indicate a seasonal round in the production of the fruit itself. Such statements refer only to the behavior of the Barí, and, since I was never with more than one group of Barí at a time, are subject to sampling error insofar as they represent the flora of the region as a whole.

One genus of palm exploited for its edible fruit is *Scheelea*. As in the case of heart of palm, the only time I observed the consumption of *Scheelea* fruit was in connection with the clearing of land, and the tree was probably felled for other reasons than the acquisition of its fruits. These were nearly or quite ripe at the time (mid-March) and were cracked open for the oily seeds inside, which had a subtle taste, a bit like fresh coconut. They were evidently considered quite a delicacy. It is possible that the frond ribs used for small vermin-shooting arrows, which are taken from the fronds of a stemless, enormously long-

fronded palm, come from immature *Scheelea*, which develops extremely long leaves while in the juvenile, stemless state (Braun 1968:82).

Considerably more important as a foodstuff is a palm which was identified by Dr. Read as being either *Euterpe* sp. or *Prestoea* sp. I have been able to find reference to only one species, *Euterpe karsteniana*, known from the general area of Motilonia (Wessels Boer 1970: 333). The plant exploited by the Barí may well be this one, or it may be another *Euterpe*, as yet not reported from the southwestern Maracaibo basin. *Euterpe karsteniana* is a reasonable guess judging from the description in the literature and from what I know of the plant from having eaten it. This thin but fairly tall palm with a single spineless stem is exploited by the Barí for its fruits, which are dark blue and about a centimeter in diameter. They can be eaten uncooked. One pops a handful into the mouth and chews away until the oily inner layer of pericarp—the mesocarp—has been gnawed and sucked away. Then the seed and remaining skin are spit out, leaving a blue-stained mouth. In addition to fat, it is likely that the pericarp contains some protein. The major time of consumption for these fruits seems to be from February through June, although I recorded some eaten in other months.

The probable *Euterpe* fits naturally into a group with two other palm fruits, both as regards their phylogenetic position and their place in the Barí diet.

The first of these two is the fruit of a palm of the genus *Oenocarpus*. The species in question is a spineless cluster-stemmed palm that produces bunches of purplish-black fruits about the size and shape of cocktail olives, ovoids about one and one-half by two centimeters. There appears to be only one species known from either Colombia or Venezuela that fits with my notes about this tree and Dr. Read's assurance that is an *Oenocarpus*. That species is *O. mapora*, which is known from the vicinity of Motilonia (Dugand 1940:50; Wessels Boer 1970:326).

These fruits must be cooked very slightly before eating. Putting them in a pot with water and barely bringing the water to boil is sufficient. The skin is too crumbly to pop them in the mouth and chew the pericarp—trying that procedure fills the mouth with crumbs of inedible outer rind (exocarp) as well as inner, pulpy mesocarp. The proper technique is to ease the whole pericarp off the nut in two or three large pieces, then scrape the mesocarp from the exocarp with the thumbnail. The pasty pulp that collects on the nail tastes slightly like Brazil nuts. It is high in fat and very probably similar in protein content to the next species treated below, which is even more important in the diet. I recorded the consumption of *Oenocarpus* fruits in all the months from October through April, inclusive, with the exception of December.

The last and most important of the group of three related palm fruits under discussion comes from a tree of the genus *Jessenia*. The tree is a large (10 to perhaps 20 meters tall) solitary and spineless palm. The fruits are purple-black ovoids about the size of jumbo olives, three to four centimeters long by about two centimeters in diameter. They are prepared and eaten in the same way as the *Oenocarpus* fruits discussed above, except that they require a bit more cooking. *Jessenia repanda* is mentioned by Dugand (1940:50; 1944:450–1), as being known from the Catatumbo basin. He hints that it may be conspecific with *J. polycarpa*, a much better known and more widely distributed species. As was the case with all the other species of palm for which specific

names were presented, the identification is by no means beyond doubt. According to Dr. Read, however, the tree is almost certainly of this genus. To a greater degree than either of the other two palm fruits under discussion here, these jessenias provide a substantial meal. As would be expected from their greater size, the pulp layer of the pericarp is considerably thicker as well as greater in surface area, and one can actually get full on a meal of *Jessenia* fruits and manioc. I have recorded the consumption of these fruits in the months from February to October, inclusive, with the exception of May and July. A dietary contribution of *Jessenia* that has to do with a nonfruit product of the tree is discussed below.

It is a common occurrence, when a hunting expedition is on its way home empty- or light-handed (or on the rare occasions when a fishing expedition is in the same lamentable situation) for it to stop for a moment on the trail and send a boy or young man up an *Oenocarpus* or *Jessenia* (more rarely a *Euterpe*) tree to pluck a bunch of fruit. The hunting party seldom has to go more than a few meters from the trail to find a suitable tree. These palms, then, from Barí point of view, provide an easily accessible and rather dependable substitute for meat. The question of the quantity and quality of this substitute of course arises.

In discussing the value of this meat substitute, I am forced to rely on the rather numerous but very spotty citations in the literature. Nevertheless, because my notes deal more with the amount and manner of fruit consumption by the Barí than with the amount and manner of fruit production by the trees in question, this step is unavoidable.

In the most recent revision of palm classification, Moore (1973) groups *Jessenia*, *Oenocarpus*, *Prestoea*, and *Euterpe* together into a single alliance having only two other members. An alliance is the smallest supergeneric unit that Moore recognizes, and it is reasonable to posit that statements true for one genus may also apply, in a limited way, to the other genera in question. The alimentary possibilities of both *Jessenia* and *Oenocarpus* have received some attention in the literature, in that they are exploited on a small scale by Colombian and Venezuelan homesteaders for the oil that can be extracted from the fruits and for the beer that can be made from infusions of the pericarp. (The most common Spanish names given the two genera seem to be *seje* and *milpesos*, which refer to *Jessenia* and *Oenocarpus* respectively, according to Dugand (1972:57); but which apply to either genus indiscriminately according to Perez Arbelaez (1956:575, 577).)

Dealing first with quantitative aspects of the dietary contributions of these palms, Dugand (1972:52ff), in discussing *Jessenia polycarpa*, claims a fruit production of an average of two bunches of fruit per tree per year, each bunch weighing in the neighborhood of 15 kilograms. Now, the largest quantity of *Jessenia* fruits I ever observed one Barí hearth group to bring home was only eight kilograms, and the average weight brought into the home was only about four kilograms. Since the Barí are never profligate with food once they have decided to use it, I am certain that no part of the fruit bunch was discarded before bringing it home. The discrepancy between my figures and Dugand's can be resolved in a number of ways: Dugand's figures may refer to cultivated palms, which could be expected to yield more heavily than untended ones; Dugand specifies that he is speaking of *Jessenia polycarpa*, while the *Jessenia* used by

the Barí may well be *J. repanda* (assuming the two are not conspecific) with a smaller fruit production, or even some third species; the Barí may well harvest the fruit before it is fully developed in the sense of commercial agriculture.

I have been unable to find any figures in the literature for fruit production of *Oenocarpus* or *Euterpe*. My own figures indicate an average weight per bunch of about three kilograms for *Oenocarpus* fruits and about two kilograms for *Euterpe*. (I must caution again that these figures are based on what reached the house and not what grew on the tree. It is possible that the *Euterpe* figure in particular represents the fruit bunches of several trees, since it is the custom to remove *Euterpe* fruits from the rachis and pack them in a basket before bringing them home.)

Beyond Dugand's assertion that *Jessenia* will produce two bunches of fruits per year I have little information on the frequency of fruiting of individual trees. As we have already seen, either *Jessenia* or *Oenocarpus* (the two really important fruits) is available for at least eight months of the year in at least some localities of Motilonia, and it is quite possible that they are available during months for which I have no record of their consumption. Adding *Euterpe* to the list adds the month of May to the calendar of availability, giving the trio a yearly range of nine months of 12. Bannister (1970) found that a Puerto Rican palm, which she called *Euterpe globosa*[1], had peak flowering and fruiting seasons, but that some individuals were in fruit at all times of the year. A similar pattern exhibited by all the palms of the "*Jessenia* trio" would explain the lengthy but patchy consumption records I recovered from the Barí.

[1] I am indebted to Dr. Read for pointing out that the correct name for this palm is *Prestoea montana*; cf. Moore (1963:145, 159).

The discussion of the food value of the individual fruits will center on *Jessenia*, that being the only genus for which either my own data or the data available in the literature are even minimally adequate. As a rough basis of comparison, the *Oenocarpus* fruits weigh about half as much as the *Jessenia*, and the small *Euterpe* fruits probably weigh no more than one-eighth as much as *Jessenia*. As to the nutritional quality of these other fruits, one can only guess that it may be somewhat comparable to that of *Jessenia*.

A fresh *Jessenia* fruit (of the variety consumed by the Barí; Dugand's cultivated *J. polycarpa* fruits are apparently somewhat smaller) weighs about 17 grams. Of this weight, about two and three-fourths grams (roughly 15%) is the edible portion of the pericarp—the pulpy and somewhat fibrous mesocarp. Combining figures given for *J. polycarpa* by Dugand (1972:52ff.) and chemical analyses of the *Jessenia* exploited by the Barí kindly provided by Dr. Maryann Hoskins of New Mexico State University (personal communication) and Brian Weiss of UCLA (personal communication), we can arrive at a rough figure for the nutrative composition of the edible mesocarp. Briefly, and emphasizing that we are dealing with approximations, the composition is as follows. About one-third of the mesocarp is water. Of the remaining two-thirds dry weight, about 70% is crude fiber, about 18% is fat, and about 8% is protein. The remaining 4% may be carbohydrate, or may be experimental error and/or the incompatability of the methods or species used by the various sources: Dugand for fat, Weiss for fiber, and Hoskins for protein.

Even these rough figures make clear the importance of palm fruits in the Barí diet. Going back to our initial figure for an average single harvest of about four

kilograms of *Jessenia* by a single hearth unit, we can follow out the dietary contribution made by this bunch of fruit by tracing out the various percentages given above. The four kilograms of fruit will provide about 600 grams of edible material. Of this material, 200 grams will be water, 280 grams will be crude fiber, 72 grams will be fat, and 32 grams will be protein. For comparison, 32 grams of protein is slightly more than is contained in five large eggs. (Five eggs weigh, incidentally, about 250 grams, so in order to obtain an amount of protein equivalent to what the eggs yield, it is necessary to consume more than twice that weight of palm fruit mesocarp.) One's attention is naturally drawn to the protein content of the palm fruits, since protein deficiencies are a topic of daily discussion. We should not overlook their fat content, which may be every bit as important in a diet, such as that of the Barí, that may be seasonally lacking in animal fat.

The dietary value of *Jessenia* is thus well established, for even if the nutritive breakdown given above should err on the side of making the protein content twice as high as it actually is, the fruits still provide a high protein dietary input. Insofar as *Oenocarpus* is concerned I can only repeat that on taxonomic grounds it is likely to be somewhat comparable to *Jessenia*, and that by inspection (i.e., the sense of taste) and commerce (it is used to produce oil) it also has a high fat content. *Euterpe* remains problematic, although the taxonomic argument holds for it too, and it is also used (Dugand 1972:57) to make a sort of beer. There are no figures available for the amino acid balance of the protein component of any of these fruits; so the quality of this protein in human nutrition remains an open question.

Some aspects of the ecology of these three trees are interesting and provide an insight into the adjustment the Barí have made with their natural surroundings. Dugand (1972:62) mentions that the fruits of all three of the species we have been considering immediately above—in addition to those of *Bactris* and *Astrocaryum*, which were treated at the beginning of this article—are favored food for practically all the herbivorous jungle mammals, especially the collared and the white-lipped peccaries. Naturally these animals help disperse the seeds in their droppings. A number of bird species, particularly parrots, toucans, and guans, are also very partial to the fruits of the *Jessenia* trio. The Barí hunt these birds for food, and they also hunt peccaries and other animals that feed on palm fruits such as monkeys and large rodents. They are thus in competition with their prey animals for palm fruits. The competition is not without its advantages, for in times of scarcity of the fruits, both the Barí and the animals are likely to converge on the same trees, thus simplifying the location of game. Thus, the fact that the *Oenocarpus* and *Jessenia* seeds collected by the Barí are killed by boiling works to their advantage, for the fewer trees there are, the more likely it is that animals and man will come to the same tree at the same time. As I mentioned in passing above, the trees of the *Jessenia* trio are extremely numerous and there is no question of the Barí exterminating them or even making them rare. A little judicious limitation of their propagation, however, may well aid in putting more animal meat on the table.

Another Barí practice that also limits the number of palm trees (only *Jessenia* in this case) but exchanges that limitation for animal protein is the following: It is a common practice to cut down *Jessenia* trees and leave the logs lying

in the forest. In two or three months the whole trunk is infested with the edible larvae of the palm weevil, *Rhynchophorus palmarum*, which usually attacks only the crown of the tree. (This weevil was kindly identified for me by Mrs. Rose Ella Warner-Spilman through the courtesy of Dr. Paul J. Spangler of the Smithsonian Institution, from an adult specimen.) Several hundred grams of larvae can be extracted from a single trunk, which is split open with an ax. In my field notes I have recorded an expedition to collect these grubs. We visited seven tree trunks in the space of an hour and a quarter. The first and fifth trees had a few grubs, and the seventh was plentifully supplied. Two of the trees had already been opened and some of their *Rhynchophorus* removed. All of the trees had at one time hosted grubs, as attested by the honeycombing of their interior, and in the four cases in which no larvae were presently resident, they had presumably matured and the adults flown away. An idea of the abundance of *Jessenia* is given by the distance we walked to get from one log to another: 20 meters between the first tree and the second; 200 meters from there to the third; then 100 meters; 50 meters; 300 meters; and 100 meters. From the seventh there were visible several more live *Jessenia* with green fruit. We brought home about 250 grams of weevil grubs, and had consumed a considerable fraction of that quantity while in the process of extracting them from the tree trunks.

Only *Jessenia* is used as a "grub farm" in this way by the Barí, despite the fact that *R. palmarum* will infest at least the crown of a great many other kinds of palms. This fact lends a good deal more credence to the arguments having to do with the advantage gained in reducing the abundance of this particular tree.

In sum, as well as furnishing the Barí with indispensible raw materials like bow wood and matting material, the palms of Motilonia also furnish a protein resource which "buffers" any vagaries in the supply of meat. While the total amount of palm fruit and grubs eaten is far less than the amount of, say, fish consumed, the availability of the palm protein at times when alternatives are in short supply probably means that the Barí are able to support a larger population year-round than would be the case if they had to rely exclusively on the somewhat seasonal fish catch and the unreliable hunt.

Acknowledgments

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NEWS OF THE SOCIETY

The following comes from member Dillwyn Paxson in Arkansas about *Rhapidophyllum hystrix*: "My needle palms (four large) came through a very cold winter where we had much snow and ice and long-lasting cold, with at least 20°F below zero. It appears that there may be some seeds for the Seed Bank in December 1977 or January 1978." Unfortunately, this palm grows very slowly in its early years so waiting for seeds to produce plants large enough to set out may be a matter of five years at least and perhaps more. Who knows how far north it may grow?

News from California

On Sunday, April 17, the Southern California Chapter of The Palm Society held a meeting at the home of Jim Wright, newly elected Chairman. Over 50 people attended a very enjoyable potluck dinner. Jim has an interesting garden with many mature palms, including fruiting *Rhopalostylis sapida* and a *Neodypsis decaryi* (not many of these in California). $80 was raised on a raffle, the winners taking home a beautiful *Rhapis excelsa* donated by Rudy LaSogga and a *Hedyscepe canterburyana* donated by Pauleen Sullivan. Secretary Lois Rossten reported the above and added that the Chapter had a booth at the "Spring Extravaganza" of the Los Angeles County Arboretum in Arcardia. Plants were taken to the exhibit and promotional material distributed regarding the society.

The July 23rd meeting was held at the homes of Lois Rossten and Frank Ketchum. Approximately 85 people attended. The side-by-side gardens offered a variety of palms, cycads, and cactus for everyone. A potluck lunch was followed by a raffle and an auction.

News from Florida

A report by member Mrs. Laurel Bird of the Miami Chapter follows, concerning the recent meeting. "It was an exotic summer evening, that Saturday, July 30, 1977, when the Miami Chapter of The Palm Society met. It was hot in Miami but the bayfront yard of Mr. and Mrs. T. C. Buhler was cooled by a delightful southeast breeze blowing off the water. The 60 some members came not only from the local area but from many parts of Florida and even beyond for a dish-to-pass supper and to hear a talk by Dr. Harold E. Moore, Jr. Dr. Moore captivated his audience with tales about the people and plants of Surinam, in northern South America, from which he recently returned. Also, unhappily, he spoke of a new disease

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