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The Palm-Leaf Sail of the Warao Indians

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For hundreds and possibly thousands of years the Warao Indians have made their home in the extensive 22,500 km² wide swampland of the Orinoco Delta on the east coast of Venezuela, South America. Currently the tribe numbers an estimated 16,000 individuals in whose language the self-denomination Warao means "boat people." Contemplating the thoroughly aquatic Delta with its network of innumerable rivers and drainage canals it is hardly surprising to find the dugout canoe so intimately associated with these people. Without boats human existence in the Orinoco Delta would be nearly impossible, for the Warao spend much of their life traveling, transporting, fishing, and foraging on board their multipurpose craft.

Until the late 1920s the Warao had remained nonagricultural swamp foragers who provided for themselves by exploiting the wild animal and plant resources of their habitat. Principal among the plant foods were those obtained from palms like *Mauritia flexuosa*, *Manicaria saccifera*, *Euterpe* sp., and *Jessenia*, and throughout the historic era missionaries, travelers, and ethnologists have repeatedly marveled at the high degree to which Warao economy has been adapted to the palmetum of the Orinoco Delta.

Among the different kinds of palm *Manicaria* (*temiche*, *timiche*, *timití*, *truli*, *ubussú*) ranks second only to *Mauritia* in importance to the daily lives of the Warao. The four known species of the genus *Manicaria* are palms that occur from Central America, across Trinidad, the Orinoco Delta, and the Guianas down to the lower Amazon River. Throughout this vast region they occur as very conspicuous and abundant swamp plants, sometimes in forests interspersed with other growth and at other times as colonies, or *temichals*, of considerable density. In the Orinoco Delta the palm grows dispersed or clustered, mostly in the 60 km-wide tidal zone along the seaboard, precisely in the region where the majority of the Indians live.

I have previously detailed the palm's value as a source of food, raw material, and medicine (Wilbert 1976). In a recent issue of this journal I described the manufacturing process of a *temiche* cap from the saclike spathe of the *Manicaria* (Wilbert 1980). But here I should like to document an ingenious naval invention of the Warao who employ the large leaf of *Manicaria* to sail before the wind.

The outstanding characteristic of *Manicaria* is its leaves, renowned as among the largest in the plant kingdom and the biggest entire leaves that grow on palms. Leaves of 9 to 10 m in length and 1.5 to 2 m in width are not unusual, and 15 to 20 contemporaneous suberect leaves can often be seen together with several persistent dead ones hanging down the stem. The younger blades of inner leaves are undivided, whereas those of the outer ones tend

1. *Manicaria* palm at the edge of an open field with one inner leaf of undivided blade; surrounding leaves are wind-torn with irregularly pinnatisect blades.

to become wind-torn and irregularly pinnatisect.

For obvious reasons the Warao choose for their *Manicaria* sail an undivided inner leaf. In view of the palm's ubiquity, finding a leaf requires little effort and cutting it, with a single blow of a bush knife, even less. The Indian takes the leaf to his boat and sits down in the midsection of the ca-

2. *Manicaria* leaf sail braced against a strut in the midsection of a fishing canoe. The Indian is seated on his paddle, which he will need for the return trip, and holds the leaf sail with his left hand.

noe. He then braces the bottom of the upright leaf against a strut and his foot or in a so-called step attached to the floor of the dugout, while holding on to the rachis with one hand. Depending on the strength of the wind, two overlapping leaves may be held up as a single sail. If there is a large number of

3. Adolescent Warao and young boy sail their dugout by means of a *Manicaria* leaf sail. Paddles serving as improvised seat and rudder will be used to propel the vessel on the way back.

passengers on board or if a heavy load needs hauling, two or more such sails are raised in the prow section of the boat.

The Orinoco Delta is situated between 8° and 10° North Latitude, subjected, that is, to the northeastern trade winds. More than 30 percent of

4. Sailing toward a favorable spot to fish with net, young helmsman maneuvers to avoid collision of his craft with author's oncoming motorboat.

the wind direction frequencies are northeasterly to easterly with an average velocity of 5 kph. Conditioned by strong Amazonian offshore currents, most of the rivers draining the Orinoco Delta are diverted to flow in a northeasterly direction, open, that is, to the trades. These are the winds

5. Sailing cargo boat with three leaf sails. A dozen passengers and a heavy load of firewood are visible. (Photo by Peter T. Furst.)

Warao take advantage of when sailing inland from the coast. In comparison, wind frequencies and velocities from other directions of the wind rose are less significant, although they do blow at times (from 1 percent to 7 percent) with velocities of 1–3 kph. I have clocked canoes 6 m long with two paddlers but no sails going 3 kph, at full speed. Canoes with *temiche* sails go at least as fast if not faster and, of course, for a longer period of time.*

The full work capacity of the *temiche* sail becomes especially evident when several of them are used on cargo boats. For instance, with two or three crewmen, seated or standing, attending to their sails in the bow, the load being pushed before the wind may consist of as many as a dozen passengers and a heavy cargo of firewood. To see a boat like this go by at a good speed and with no human effort other than the helmsman keeping course by means of a paddle held vertically as a rudder leads one to realize that the *temiche* sail of the Warao represents critical navigational tackle, despite its elementary nature. *Manicaria* leaf sails are as efficient as they are handy, free, and uncomplicated. In fact, the leaf sail and the idea of employing it for wind-powered navigation are so natural in this environment of wind-swept rivers that one wonders whether sailing is indeed a post-Columbian innovation along the northern seaboard of South America or whether it might not be an autochthonous invention after all. True, the Warao term for the *Manicaria* sail is *yawihi wera*, derived from *yawihi*, *temiche*, and *wera*, the Spanish word for sail (*vela*). And yet, it would seem ironic that navigators

* I am grateful to Dr. Elwin V. Svenson and Dr. H. Dieter Heinen for their assistance with the nautical experiments in the field.

6. Dugout canoe on land with fixed step for leaf sail. (Photo by Peter T. Furst.)

like the Warao, with centuries of experience in wind and water, would have to await the coming of the Europeans to become inspired by their small-boat sails.

For this as well as for a related ethnohistorical question, there exists no conclusive answer at this point. I am referring to the fact that the Warao have been known to cross the Carib-

bean Sea to go to Trinidad and, possibly, other islands. There are Indians still living in the Delta who have participated in such voyages but none of those I queried recalled using *temiche* sails on their way across the sea, not even on the way home when the wind favored their course. Overseas voyages took place usually between July and September when the trade winds are calm and the waves small. There is some weak evidence for the existence of the knowledge of aboriginal sailing in the Caribbean (Edwards 1965). This, however, is inconclusive, and no new light can, unfortunately, be shed on this question from the point of view of Warao navigation. Irrespective of whether the sail originated with the Warao or whether it was adopted from other Indians or Europeans, however, nowadays at least, navigating by means of *temiche* sails is a serious nautical tradition among the Warao. For centuries, the palm's spectacular leaf has served the Warao well in their windswept world.

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WHAT'S IN A NAME?

Nengella (neng éll a) combines *Nenga* with the suffix *-ella*, originally a diminutive. Other such names are *Phlogella* (flo géll a) combined with *Phloga*, *Haitiella* (háy tee éll a) after the island of Haiti, *Iriartella* (ír ee are téll a) combined with *Iriartea*, *Mauritiella* (maw rít ee éll a) combined with *Mauritia*, and *Zalacella* (zá lack éll a) combined with *Zalacca*.

Neodypsis (née oh díp sis) is derived from the Greek *neos* (new) and the generic name *Dypsis*. Some other names that similarly incorporate *neo-* are *Neonicholsonia* (née oh nick ole só nee a) named after George Nicholson (1847–1908), once Curator of the Royal Botanic Gardens at Kew, England, and editor of *The Illustrated Dictionary of Gardening* (1884–1887), and *Neowashingtonia* (née oh wásh ing tóe nee a) based on *Washingtonia* (see *Principes* 2: 20, 1958) named after George Washington (1732–1799).

Paralinospadix (pára líe no spáy dix) prefixes the generic names *Linospadix*, to which it is related, with the Greek *para* (beside, near, by). Names similarly derived are *Paragulubia* (pára goo lóo bee a), *Parajubaea* (pára jew bée a), and *Parascheelea* (pára shé lee a).

Pichisermollia (pée kee ser mów lee a), a replacement name for *Gigliolia*, is modified from the name of Rodolfo E. G. Pichi-Sermolli (1912–), an Italian botanist who has worked largely with ferns but who revised and published a manuscript on arecoid palms left by Odoardo Beccari (*Subfamiliae Arecoidearum Palmae Gerontogeae Tribuum et Generum Conspectus*).

Pritchardiopsis (pri chár dee óp sis) combines the generic name *Pritchardia* with the Greek suffix *-opsis* (having the appearance of, like) because of its resemblance to that genus.

Trichodypsis (trý ko díp sis) is derived from the Greek root *trichos*, from *thrix* (hair), and *Dypsis*, thus "hairy *Dypsis*" from the abundant hairs on the inflorescence.

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