

*Principes*, 27(1), 1983, pp. 12-17

## The Use of Palms by Man on Siberut Island, Indonesia

ALAN P. N. HOUSE<sup>1</sup>

*World Wildlife Fund, Jalan Ir H. Juanda 9, Bogor, Indonesia*

Siberut Island, the largest of the Mentawai group, lies in the Indian Ocean off the west coast of Sumatra, between latitudes 0°55'S to 3°20'S and longitudes 98°31'E to 100°40'E (Fig. 1). The climate is virtually aseasonal; rainfall exceeds 100 mm in every month of the year (there is no appreciable "dry" season), with an annual total in excess of 4000 mm, and temperatures are high throughout the year (mean monthly maximum daily of 30°C). During two years spent on Siberut, I made a small collection of palms (27 numbers) which are deposited at the Herbarium Bogoriense in Java. This paper presents some notes on the uses to which the indigenous population put the palm species growing on their island. A further paper will outline ecological observations made on one of the most important Siberut palms, *Oncosperma horridum*.

### Palm Species of Siberut

Table 1 lists the species of palms represented in a collection from 200 ha of primary rainforest in central Siberut (Saibi River basin). Other species previously recorded from the island (Ridley 1926) or seen elsewhere but not collected are included in the list. This list of 15 genera and 32 species is undoubtedly incomplete as only a small portion of the island was sampled and distinctive forest types such

as beach forest and old secondary growth were omitted. Certainly the rattan flora is expected to be far richer than Table 1 suggests, especially in species of *Calamus* and *Daemonorops*. However, the known palm flora of Siberut does show some peculiarities. The absence of *Livistona*, *Plectocomia* and *Salacca*, and the paucity of *Licuala* species are perhaps the most striking phytogeographical anomalies. Suitable habitats for these genera appear to be present on Siberut, whereas palms such as *Cyrtostachys* which generally grows in peat swamps or *Corypha* and *Borassus* from seasonally dry regions may not find suitable habitats. Other genera not recorded but which may be present on the island are listed in Table 2.

Several species recorded from Siberut, such as *Cocos*, *Arenga pinnata*, *Areca catechu*, *A. triandra* and *Nypa fruticans* are widely distributed in Pacific areas. With the exception of the polymorphic *Areca triandra* these species represent economically valuable palms or palms dispersed by ocean currents. A few species have much more limited distributions, especially some of the rattans. *Daemonorops dracuncula* was first described by Ridley (1926) from Siberut and has not been collected elsewhere. Of the remainder, *Plectocomiopsis* is the most interesting. Of the five known species of the genus only two are recorded from Sumatra (*P. mira* J. Dransf, and *P. geminiflora* (Griff.) Becc.). The collected specimen from Siberut does not accord with either of these in terms of leaf and armature character-

<sup>1</sup> Present address: Department of Biogeography & Geomorphology, Research School of Pacific Studies, Australian National University, Canberra, A.C.T. 2600, Australia.

Table 1. Palm species recorded from Siberut Island, Indonesia

	Origin	Usage	Local Name <sup>1</sup>
<b>ARECOIDEAE</b>			
<i>Areca catechu</i> L. <sup>2</sup>	i		
<i>A. triandra</i> Roxb.	n		nappou
<i>Nenga pumila</i> (Mart.) Wendl.	n	4	nappou
<i>Oncosperma horridum</i> (Griff.) Scheff.	n	2, 4	ari ribbuk
<i>O. tigillarum</i> (Jack) Ridl.	n	2, 4	
<i>Pinanga densiflora</i> Becc.	n	4	nappou
<i>P. coronata</i> (Bl. ex Mart.) Bl. (as <i>P. noxa</i> Bl.)	n	4	nappou
<b>CARYOTOIDEAE</b>			
<i>Arenga obtusifolia</i> Mart.	n	3, 4	pola
<i>A. pinnata</i> (Wurmb.) Merr.	i	1, 3	pola
<i>Caryota mitis</i> Lour.	n		duruk
<b>COCOIDEAE</b>			
<i>Cocos nucifera</i> L.	i?	1, 3	toitet
<b>CORYPHOIDEAE</b>			
<i>Licuala paludosa</i> Griff.	n		
<i>L. spinosa</i> Thunb.	n		
<i>Pholidocarpus</i> sp. aff. <i>mucronatus</i> Becc.	n	4	saplap
<b>LEPIDOCARYOIDEAE</b>			
<i>Calamus diepenhorstii</i> Miq.	n		alibat
<i>C. javensis</i> Bl.	n	4	pelege
<i>C. manan</i> Miq.	n	4	bebeget
<i>C. micranthus</i> Bl.	n		oilab
<i>C. polystachys</i> Becc.	n		
<i>C. rhomboideus</i> Bl.	n		patupa
<i>Daemonorops angustifolia</i> (Griff.)	n	4	labi
<i>D. crinita</i> Bl.	n		uggei
<i>D. dracuncula</i> Ridl.	n		
<i>D. hystrix</i> (Griff.) Mart. var.	n		logui biau
<i>D. spp.</i>	n		
	n	4	taset
	n		sasa
<i>Korthalsia echinometra</i> Becc.	n		dangou
<i>Metroxylon sagu</i> Rottb.	i	1, 3	sagou
<i>Plectocomiopsis</i> sp.	n		
<b>NYPOIDEAE</b>			
<i>Nypa fruticans</i> Wurmb.	n	4	nipa

Origin n = native species, i = introduced species or species of uncertain geographical origin.

Usage: 1 = cultivated, food, 2 = exploited, food, 3 = cultivated, non-food, 4 = exploited, non-food.

<sup>1</sup> Local name (Saibi River basin), <sup>2</sup> occurs sporadically on Siberut—the Mentawaians are not betel chewers.

istics, and differs from the Malayan endemic *P. wrayi* Becc. in respect to the slender stem of that species. The Siberut *Plectocomiopsis* is possibly a new species.

### Use of Palms on Siberut

The people of the Mentawai Islands are traditionally forest dwellers, combining

hunting with bow and poisoned arrow, with basic 'garden' agriculture centered on a clan-house social system (Nooy-Palm, 1968). At present much of the population is undergoing fairly rapid integration with the rest of Indonesia (Hanbury-Tenison, 1974), but many of the traditional aspects of Mentawai culture are still functional, including extensive reliance on forest

Table 2. Palm genera not recorded from Siberut but which could occur there

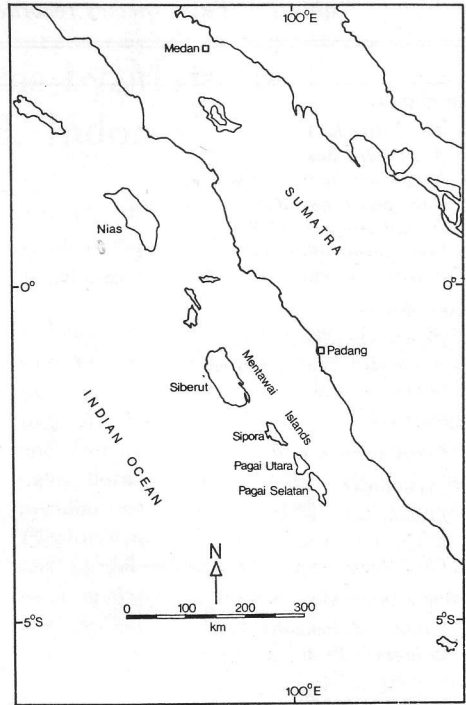
<i>Borassus</i>	<i>Johannesteijsmannia</i>
<i>Corypha</i>	<i>Livistona</i>
<i>Cyrtostachys</i>	<i>Orania</i>
<i>Eleiodoxa</i>	<i>Phoenix</i>
<i>Iguanura</i>	<i>Salacca</i>

products for food, shelter, and religion. With regard to the palms, uses may be classified into those of cultivated introduced species and exploited native forest species.

*Cultivated Species—Food.* The staple carbohydrate of the Siberut diet is sago made from the pithy inner tissue of stems of *Metroxylon sagu*. The geographical origin of *Metroxylon* as a genus is still unclear (Corner 1966), but it seems likely that its center of evolution is far to the east of Siberut; it is not clear how sago came to the Mentawai Islands. It could be a relatively recent arrival, as although ethnological evidence points to a gradual migration of people from north to south from Nias to Pagai, sago eating is confined to Siberut. On Sipora and Pagai taro (*Colocasia esculenta* L. Schott and *Alocasia macrorrhiza* L. Schott) is the staple. Taro is grown on Siberut but as a supplement to sago rather than as a major crop. Whitten (1981) has detailed the preparation of sago flour by the Mentawaians (see photos, *Principes* 25: 91–100).

*Arenga pinnata* is occasionally cultivated for its sugar, which is obtained by tying together rachillae of young inflorescences, bruising them, cutting off the tips, and tapping the exudate. This is often drunk without further preparation, usually hot. Solid raw sugar is not generally prepared from *Arenga*.

The third cultivated food palm is the coconut, *Cocos nucifera*. The uses of this palm are of course legion. Apparently until quite recently coconuts were not planted near Mentawaiian villages as they would reveal the location to unfriendly tribes



• 1. Location of Siberut Island, Indonesia.

(Nooy-Palm, 1968). Hence the present inland distribution of the species along major rivers and near clan-houses is a recent phenomenon. Traditionally, usage of coconuts for food was possibly restricted to drinking the water of young fruits and mixing grated flesh with sago. As a result of increased cultural contact with Sumatra, coconut flesh is now extensively used to make sauces and is mixed with cooked taro to make confections. Copra (dried coconut flesh) is collected and exported to the mainland; there is also production of coconut oil from copra on the island itself. Every inhabited site has its coconut palms—they are often important constituents of bride-prices. It is interesting that the Mentawaians have a distinct vernacular name for *Cocos* (*toitet*), whereas they use the ubiquitous *sagu* or *sagou* for *Metroxylon*, further suggesting that the latter species is a much later arrival to the



2. Palms are abundant in Siberut rainforest under-story. *Pinanga* and *Calamus* spp.



3. Large *Arenga pinnata* with ladder for access to sugar-bearing inflorescences.

island and postdates the arrival of man himself.

*Exploited Species—Food.* Of the native palms of Siberut, only two are occasionally exploited for their food values. The cabbage of *Oncosperma horridum* (and presumably *O. tigillarum*) is eaten raw or cooked in a coconut sauce, but apparently only when a stem has been felled for another purpose—the wood is perhaps too hard to risk shattering a jungle knife blade. Similarly, the fruits of *Calamus manan* are probably only eaten if the cane is collected and a stem happens to be fruiting, or when food runs short on a hunting expedition.

*Cultivated Species—Other Uses.* Each of the three cultivated palms has uses other than those of nutritional value. *Metroxylon* wood is used extensively for walkways and temporary walls. The leaves are the primary source of thatching material and are also used to wrap around sticks of sago

during cooking. The stout petioles serve as makeshift *abak* (dug-out canoe) seats, while the broad leaf sheaths are flattened and sewn together to make sleeping mats and sun hats. The raw pith is given to semi-domesticated pigs and chickens as supplementary feed.

Coconut leaflets are used to weave baskets and mats, but these have only a limited life expectancy. The woody shells of the fruit are used as spoons and containers, and the dried outer husk is considered one of the best materials for carrying fire—the fiber smoulders for hours and is easily fanned into a flame. The somewhat aromatic smoke given off is useful as a mosquito repellent.

As *Arenga pinnata* is hapaxanthic and dies after flowering and fruiting; after the inflorescence is tapped for sugar, moribund stems are felled and used as house supports or fences. The fibrous material at the bases of the leaves is one of those

used to construct sieves for straining sago pulp. Nooy-Palm (1968) reports that on Sipora and Pagai, flowers of *A. pinnata* are used as part of the *katsaila* or floral bouquet used in religious ceremonies. I feel that the food value of *A. pinnata* is too great to be used in this way (the Mentawaians are very pragmatic people) and it is more likely that *A. obtusifolia* is used instead.

*Exploited Species—Non-food.* *Oncosperma* is perhaps the most useful palm in this category. Split trunks (with spines removed) are the universal flooring material and are also used as roof rafters. Kept dry the hard wood will not rot. The wood is used to fashion arrow heads. Half-trunks are driven into the ground to form pig-proof fences, and are laid along muddy ground as elevated walkways. The leaf sheaths, despined, are shaped to fit on to rattan baskets and act as back panels, and even the dried leaves have a use—they are considered the most reliable source of tinder in the forest and will even catch alight in heavy rain. Presumably the overhead canopy of palm crowns prevents fallen leaves from becoming saturated.

Of the other arecoid genera, *Pinanga* and *Nenga* are used to make temporary forest shelters, the petioles plunged into the ground at an angle to form a one-sided arch. In some regions (notably Sarareiket) small arecoid trunks are used to make traps to catch the Mentawai macaque (*Macaca pagensis*).

The native *Arenga* (*A. obtusifolia*) is of more significance. Mentawaiian long bows are fashioned out of the hard black outer wood which combines strength and durability with just the right amount of plasticity. Apparently *Oncosperma tigillararium* wood is used for bows on Pagai (Crisp 1799). Twisted leaves of *Arenga* are used to construct temporary back-packs for carrying blocks of sago flour or trussed pigs. Split trunks make strong house supports and fences. The stiff midrib of old leaflets are bound together to

make brooms, and the fibrous leaf bases are used with those of *A. pinnata* in the construction of sago sieves. These sieves may be the only use to which *Pholidocarpus* is put; the species is not common enough to create demands for its extremely hard wood.

*Nypa fruticans* is an important source of thatch for coastal villages. Recent increases in coastal population have thus created heavy pressures on stands of *Nypa*, but fortunately many areas in which the palm occurs also have low-lying swamps of *Metroxylon* behind the coastal belt of vegetation; *Metroxylon* is a better quality thatch. There seems to be no local manufacture of sugar from *Nypa* inflorescences (see Burkill 1935), although the tobacco-loving Mentawaians have learned to make cigarette papers from the unopened leaf batons—traditionally they use dried banana leaves.

Despite the abundance of rattans in Siberut rainforest, few species are used by the inhabitants. By far the most important species is *Calamus javensis*, which is used for a multitude of purposes that require a flexible tying material. Other species of similar dimensions are considered inferior and as a result some areas have very depleted stocks of *C. javensis*. Most of the basketry on Siberut uses *C. javensis*, and in house construction its principle use is in securing *Metroxylon* leaves to split bamboo to make thatch. Other rattans of local importance are *Calamus manan*—petioles of juvenile leaves are used as arrow shafts—and *Daemonorops angustifolia*, whose heavily armed petiole bases are used as coconut graters.

Commercial rattan collecting has now become of considerable importance in many parts of Siberut (see World Wildlife Fund 1980). The species of prime importance is *Calamus manan*; other smaller species are also sought by the Sumatra based companies, but as this form of forest exploitation is alien to Mentawaians there is some wastage when the wrong

species are collected. The Mentawaians themselves make little use of these economically important palms except for heavy duty tying jobs.

### Conclusions

Although Mentawaiian culture does not embrace the full multiplicity of uses to which Malesian palms can be put (see Burkhill 1935, Dransfield 1976), the reliance on forest palms for everyday requirements is great, despite the limitations imposed by a relatively impoverished palm flora. The recent introduction of commercial palm exploitation (sugar making, copra collecting, and rattan harvesting) may soon be fully integrated into the Mentawaiian socio-economic system, and should not harm palm populations if sensible safeguards are applied. The Siberut biota studied thus far indicate the Mentawai Islands are unique (Whitten and Sardar 1981)—there is good reason to suppose the palms follow this trend.

### Acknowledgments

This study was partly funded by the World Wildlife Fund, the Ernest Kleiworth Fund, and the Royal Geographical Society, and was sponsored in Indonesia by the Indonesian Institute of Science, the

Faculty of Life Sciences, Andalas University, and the Herbarium Bogoriense to whom I am indebted for species identification. I thank Dr. John Dransfield for useful suggestions and Tony Whitten for help in collecting the monstrous *Calamus manan*.

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