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## Uses of Some Indigenous Vanuatu Palms

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The first European to record the uses of Vanuatu plants was the Portuguese voyager Pedro de Quiros who visited Espiritu Santo in 1606. In the journals of his voyage there are many references to the coconut palm (*Cocos nucifera* L.), and how it was locally used for thatch, utensils, and food (Zaragoza 1876, Markham 1904, Yen 1973). Subsequent naturalists and explorers, such as Forster (1777, 1786), MacGillivray (1853), and Angas (1866) also noted the uses of palms, in particular semidomesticated species such as the coconut and sago palms (*Metroxylon* and *Caryota* spp.), and the betel nut (*Areca catechu* L.). In recent times, researchers have presented detailed studies of a few indigenous domesticated palms (Barrau 1958, 1959; Gowers 1976, Walter and Bourdy 1987; Yen 1982, 1985), though the first comprehensive account of the use of both wild and domesticated Vanuatu palms was provided by Cabalion (1989), who based his studies on his own extensive field work.

### Background

Vanuatu is a long, narrow y-shaped archipelago of volcanic origin situated south-east of the Solomon Islands, west of Fiji and north-east of New Caledonia, in the south-west Pacific Ocean, between longitudes 166°45'E and 170°20'E and latitudes 13°05'S and 20°20'S. Permanent settlement by Melanesian peoples is estimated to have begun ≈3 500 yr ago (Spriggs 1984). Presently, only 12 of Vanuatu's 80 islands (total area of ≈12 300 km<sup>2</sup>) have significant populations (altogether 142 000 people, cf. 1991 census), most of whom live in rural villages with limited economic development. Average population density is 11.6 persons/km<sup>2</sup> while rural population (≈85% of total) is 9.5 persons/km<sup>2</sup> (AIDAB 1992). The only significant urban area is the capital city, Port Vila, which has ≈17 000 inhabitants, many of whom are expatriates employed in government, tourism,

or business. The rural population consists primarily of traditional multicrop subsistence farmers who also maintain small holdings of permanent cash crops (Weightman 1989). By necessity, they use the local forests as essential sources of building material, food, and medicine.

The larger islands are mountainous with average elevation above 300 m, and account for 60% of Vanuatu's land-surface area. The highest peak is Mt. Tabwemasana (1 887 m) on Espiritu Santo. There are five active volcanoes throughout the country. Rainfall is above 1 800 mm/yr in most localities, and exceeds 5 000 mm/yr at high elevations. Four to five cyclones affect severely some part of the archipelago every year.

Vegetation is dominated by moist forest. Primary and secondary forest account for ≈35% of land area, while ≈25% is used for settlement and agriculture (AIDAB 1992). There are estimated to be ≈2 000 species of higher plants occurring in Vanuatu. Floristically the vegetation is most closely related to that of Fiji and secondarily to that of the Solomon Islands. The endemism rate for species is ≈16%, for genera ≈0.5%, and there are no endemic families. The palm flora displays a much higher rate of specific endemism (≈74%) than do most other families. Indeed Vanuatu's only endemic genus (*Carpoxyylon*) is a palm.

The palm flora, as treated by Dowe and Cabalion (1996), includes 21 species in 15 genera, of which 14 species and one genus are endemic. Affinity of the palm flora lies predominantly with that of Fiji.

### Observations

This paper treats five species of palms (*Carpoxyylon macrospermum*, *Clinostigma harlandii*, *Licuala grandis*, *Veitchia macdanielsii*, and *V. spiralis*), which were incidentally encountered during field work involving the 'Carpoxyylon Population Survey' conducted over 5 wk in Novem-

ber–December 1994. In addition to use, custom stories were also recorded for two taxa. Voucher specimens (deposited in BRI) were taken for most species. Information herein presented was obtained from numerous informants who were approached and interviewed in villages during the survey. Photographs were taken as an additional record.

***Carpoxyton macrospermum*** H. Wendl. & Drude (Voucher, *Dowe 0129* [BRI])

*Description:* single-stemmed, arecoid palm to 28 m tall and trunk to 25 cm DBH. Leaves 10–12 in the crown, to 4 m long, strongly arched; pinnae linear, held erect to form a steep “v.” Inflorescences infrafoliar, to 1 m long, with spreading branches. Fruit large, to 6 cm long by 3.5 cm in diameter, dark red at maturity, ovoid-ellipsoid with an obliquely orientated subapical cone of stigmatic residue (Fig. 1). Fruit may mature at any time in the year, though there is a climax during February to June.

*Distribution:* natural populations are confined to Aneityum, Futuna, and Tanna in lowland rain forest; otherwise sporadically cultivated in villages on other islands.

*Carpoxyton macrospermum* is presently the subject of a conservation inquiry (Dowe, in prep.) and is listed as Endangered by the IUCN’s Palm Specialist Group (WCMC 1993). According to the 1994 survey, the known population stands at  $\approx 150$  mature palms of which  $\approx 30$  occur in primary forest (Dowe 1994).

The main uses of *Carpoxyton* include consumption of the fruit, fabrication of brooms from the leaves, and the fashioning of carrying and storage vessels from the prophyll (first inflorescence bract) and leaf sheath. Degree and style of use vary from area to area. In the southern islands, the primary use is consumption of the fruit. Only the endosperm of immature green fruit can be eaten as it becomes extremely hard at maturity. To extract the edible endosperm, the fruit is cut longitudinally with either a knife or with the teeth. The endosperm is of a dense jelly-like consistency (Fig. 2). The nutritive content is undescribed, though it would be expected to be high in protein, digestible carbohydrates, and fats as in typical palm endosperm. “Navara,” the sweet flavored developing haustorium and nonfibrous plumular tissues of the germinating seed, is also eaten, particularly by children. Consumption of the fruit and “navara” takes place in all areas where the palm

occurs, from both natural populations and cultivated plants.

The making of brooms from the leaves was recorded from cultivated plants on Malakula where *Carpoxyton* is known as *bungool* (Atchin language) or *bunglu* (Tautu language). To make a broom, a dying or recently fallen leaf is obtained. The petiole, which eventually becomes the handle, is cut about midway, while the rachis is also cut about midway and discarded. In some areas, the entire petiole is removed and the rachis itself is smoothed for use as the handle. The pinnae, which are rigid and coriaceous, are cut about one-quarter of the way in from their apices (Fig. 3). The brooms made from *Carpoxyton* leaves are favored over other palm species because of their superior strength and longevity. Old inflorescences are also used as brooms in south Espiritu Santo.

Carrying vessels for various purposes are made from the prophyll and the leaf sheath in all areas visited. Most of the vessels are made for daily use—for the preparation and storage of food, as baby-baths, animal feeding troughs, etc. In some parts of Malakula (e.g., Brenwei area) the leaf sheath is made into ceremonial drinking bowls for the consumption of kava (a narcotic beverage extracted from the rootstock and lower stems of *Piper methysticum*) (Fig. 4). Both the bowl and the palm are known as *parkel* (Unmet language) in the Brenwei area. To make these bowls, a leaf approaching senescence is carefully cut from the tree at the point of attachment. Most of the petiole is removed but leaving enough for a handle 30–50 cm long. The sheath is turned inside out, the petiole folded back behind the auricles of the upper sheath and fastened with a root or strong twig. The pressure of the petiole on the root or twig ensures that the leaf sheath remains taut. Following this, the lower half of the sheath is cut off and all the edges smoothed. Oils and resins (from unknown plant species) are liberally applied to all surfaces of the vessel, which is then placed above a smoking fire to be “cured.” The surface turns a distinctive dull black color. Use of these particular drinking vessels is reserved for ceremonial occasions. Enough kava is prepared in a single bowl for  $\approx 30$  communal drinkers. Some of these bowls were reported to have been in continual use for over 30 yr. During preparation of the kava, the vessel is supported upon a group of y-shaped branches pushed into the ground inside the Nakamal (kava drinking house).

Carrying vessels made from the prophyll are



much simpler. The shape of the prophyll naturally lends itself to such use and the only adaptation is to tie a piece of *barao* twine (*Hibiscus tiliaceus*), which functions as a handle, between the two ends (Fig. 5).

Minor uses of *Carpoxylon* include the making of pipe bowls from the dried endosperm, on Futuna Island where *Carpoxylon* is known as *napuan'savi* (Futuna language); using the fruit (while still attached to the palm) as a lure to assist in the catching of flying foxes, at Norsup, Malakula; and the use of the leaf sheath for a sleeping mat and as a shovel for hot ashes and charcoal in southern Espiritu Santo.

In addition to these uses, it is also grown as an ornamental in some villages.

A custom story relating the supposed arrival of *Carpoxylon* on Aneityum was recorded as follows:

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1. A cultivated group of *Carpoxylon macrospermum* on a hillside above the village of Umetch, Aneityum. These palms were originally collected from an area nearby where the species occurs in primary forest. 2. Fruit of *Carpoxylon macrospermum*, showing immature endosperm. Fruit are cut longitudinally to reveal the edible portion.

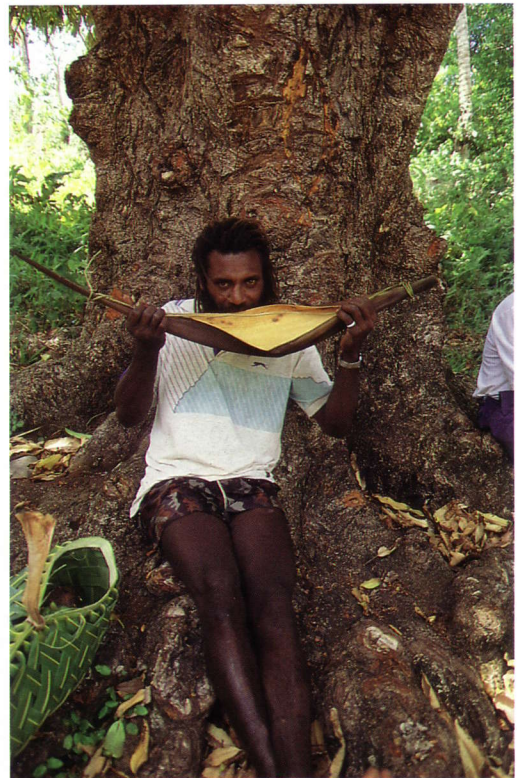






“A long time ago, a tribe of tall light-skinned, wise people came to Aneityum from the east to settle on the south coast of the island. They brought with them the palm which is now known as *nohoich* (Anatom language). From the palm they made a stringed musical instrument, though from which part of the palm and what the instrument looked like are now forgotten. The instrument made a very loud sound which soon began to annoy the local people. Eventually the local people could not tolerate it any longer and so drove the newcomers from the island. All that the newcomers left behind

3. Above left. *Carpoxylon macrospermum* brooms at Lalep village, Malakula. These brooms are favored over those made from other plants because of their strength and longevity. 4. Above right. Ceremonial kava bowl made from *Carpoxylon macrospermum* leaf sheath at the village of Brewei, Malakula. The leaf sheath is turned inside-out and the petiole held taut by a twig or root placed through the auricles. The distinctive dull black color is the result of curing over a smoky fire following dousing with oils and resins. 5. Drinking vessel made from the prophyll of *Carpoxylon macrospermum*. A handle is made by tying *Hibiscus tiliaceus* twine around both ends. →







6. Left. *Clinostigma harlandii* at 500 m elevation in mossy forest east of Anwaitch, Aneityum. 7. Right. *Licuala grandis* in lowland secondary forest, central Malakula.

were the palm and round carved stones, both of which can still be seen today.”

A traditional contraceptive was reported to be made from *Carpoxylon* in the village of Elia, west Espiritu Santo: “A small portion of ‘bark’ is removed from the lower trunk of the palm known as *olo-olul* (Valpei language) with a sharp knife, and the exposed cortex tissues scraped to form a cotton-wool like mass. This is mixed with water and the juice squeezed into a drinking vessel. A woman seeking contraception drinks the mixture, at least one cupful over four consecutive days to ensure infertility occurs. An antidote to reverse the effect and induce fertility is available. The bulb of *Proiphys amboinensis* (tapon-lapa) is dug up and the inner portions removed or loosened to develop space for the insertion of  $\approx 150$  seeds of *Coix lacryma-jobi* (Job’s tears or wasil). This article is buried under the path that the woman walks over most frequently when visiting the toilet. After some time, fertility should return.”

In the “smol nambas” community of Malakula, the palm is found only on “tabu” sites and planted at valuable taro patches. Informants related that it is “tabu” to give information on the palm and that only certain persons have customary rights to such activities. In this area, the fruiting of the palm is associated with the maturation and harvest of yams.

***Clinostigma harlandii* Becc. (Voucher Dowe 0133 [BRI])**

*Description:* stilt-rooted, single-stemmed arecoid palm to 25 m tall and trunk to 25 cm DBH. Leaves to 4 m long, gracefully arched; pinnae linear, narrow and pendulous. Inflorescence infrafoliar, large and spreading. Fruit globose, crimson at maturity, to 1.5 cm in diameter, stigmatic remains subapical (Fig. 6).

*Distribution:* confined to altitudes above 400 m; common in cloud forest throughout Vanuatu.

This palm is of particular significance on Aneityum as a "tabu" plant involved in ritual and magical activities. The following story concerning the "power" of *Clinostigma*, was recorded: "If any part of this palm, known as *naprae* (Anatom language), is brought into a village or a house, either a marriage break-up or family disturbance will result. The cause of abandonment of some villages can be attributed to this palm. If someone wants to spoil another person's garden or plantation, parts of the palm are placed down-wind so that the "fumes" of the palm will drift through the other person's plants, thus causing sterility, lack of pollination, or even for plants to die. In addition, a negative spirit known as *paralelgrhé* (Anatom language), which affects women, can be forced from an inflicted woman by the application of the sap from the pinnae to the woman's skin by rubbing."

Use of the palm in the "smol nambas" community on Malakula, where it is known as *neglep*, is confined to a temporary thatch and the leaf sheath is adapted as a utensil in the cooking of "laplap."

#### **Licuala grandis** H. Wendl. ex J.J. Linden

*Description:* small fan-leaved palm to 4 m tall and stem to 15 cm DBH. Leaves suborbicular, entire, to 1 m in diameter, on thin basally spined petioles. Inflorescence interfoliar, to 2 m long. Fruit globose, orange/crimson at maturity, to 2 cm in diameter (Fig. 7).

*Distribution:* confined to lowland and moderate-elevation rain forest, from the Santa Cruz Group in the southern Solomon Islands through the northern islands to Efaté.

A previously unrecorded use for *Licuala grandis* was noted on Malakula (Norsup area), where the species is known as *nbunebune* (Tautu language). The leaves are used in roof construction as an additional measure for water-proofing. The leaves are collected from wild plants. They are placed consecutively one upon the other so that the abaxial side of the petiole of the one above interlocks with the adaxial petiole of the one below, thus forming a relatively close fit (Fig. 8).

**Veitchia macdanielsii** H.E. Moore [Dowe and Cabalion (1996) now consider *Veitchia winin* H.E. Moore to be a synonym of this taxon.]

*Description:* single-stemmed arecoid palm to 30 m tall and trunk to 20 cm DBH. Leaves to 4.5 m long; pinnae semipendulous, with praemorse apices. Inflorescence infrafoliar, to 1.2 m long. Fruit to 3.5 cm long, bright red at maturity, ovoid, stigmatic remains apical to slightly subapical (Fig. 9).

*Distribution:* lowland rain forest on Malakula, Espiritu Santo, and Pentecost. On Malakula it is an exceptionally common and dominating species, but on the other two islands is only of limited occurrence.

The primary use of this species is in house construction, for beams, walls, benching, and ridging. In western Espiritu Santo, the distinctive verandaed houses, which are most common in villages between Olpoi and Tasariki, very often have the corner ridges held down by split and hollowed-out trunks (Fig. 10). *Veitchia macdanielsii* is known as *niniu takariki* at Olpoi and *matutu* at Vasalea (Valpei language), and *urur* at Nukuku and Penouru (Nukuku language). Doors and some walls are made of split trunks. In east Malakula, where the species forms extensive populations, attractive walls (Fig. 11) and solid benches (Fig. 12) are made from split trunks. The species is known as *winin* (Tautu language), *nini* (Wala language), and *bangul varvin* (Lepaxsivir language).

In drier areas where irrigation has by necessity been developed, hollowed trunks are used as aqueducts (Fig. 13). Some of these "primitive" irrigation systems, which convey water tens of kilometres from the source, have been in use for many centuries and are a feature of several villages in west Espiritu Santo.

As with most other species of arecoid palms in Vanuatu, the leaf sheath is used to make carrying and storage vessels. Of particular interest is the making of "regular-use" kava drinking bowls in Brenwei (Malakula) (Fig. 14), where the palm is known as *ndidi* (Unmet language). In contrast to the ceremonial bowls made from the leaf sheath of *Carpoxyton macrospermum*, the bowls made from this species are much smaller, have a limited life and are constructed as a "throw-away" item.

**Veitchia spiralis** H. Wendl. (Vouchers, Dowe 0122 and 0131a [BRI])

*Description:* single-stemmed arecoid palm to 25 m tall and trunk to 20 cm DBH. Leaves to 5





m long; pinnae semipendulous with praemorse apices. Inflorescence infrafoliar, to 1 m long. Fruit subglobose to ellipsoid, to 4 cm long by 3 cm in diameter, red at maturity, stigmatic remains apical (Fig. 15).

*Distribution:* confined to Aneityum and Futuna, in lowland rain forest on volcanic soils.

The split trunks of this species are commonly used on Aneityum as part of the roof structure of houses (Fig. 16). The fruit are sought after as bush-food by villagers working away from home. The endosperm of green fruits only is consumed. The palm-heart from juvenile palms is also commonly eaten. Ceremonial custom spears are made from the dense outer cortex of the trunk and carrying and storage vessels are made from the leaf sheath. The palm is known as *nakoi* (Anatom language) on Aneityum and as *na'puau* on Futuna (Futuna language).



8. Roof ridge in which leaves of *Licuala grandis* have been used as an additional measure to ensure water-proofing, Norsup, Malakula. 9. *Veitchia macdanielsii* in a patch of remnant forest, west Espiritu Santo. →





10. Upper. Roof corners are held in position with hollowed-out trunks of *Veitchia macdanielsii*, Olpoi village, west Espiritu Santo. 11. Lower left. Detail of house wall constructed of split trunks of *Veitchia macdanielsii*; the black sclerotic fibers within the cortex of the trunk make an attractive pattern (Lakatoro, Malakula). 12. Lower right. Roadside food stall bench constructed of split trunks of *Veitchia macdanielsii* (Wormet, Malakula).





13. Upper left. Aqueduct made from hollowed-out trunk of *Veitchia macdanielsii*; water is conveyed many kilometres from the source to irrigate taro ponds and other gardens (Tasiriki, Espiritu Santo). 14. Upper right. Kava bowl made from the leaf sheath of *Veitchia macdanielsii*, Brenwei village, Malakula. These bowls are roughly constructed, are not treated with oils or resins, and are considered throw-away items of limited life. 15. Lower left. *Veitchia spiralis*, Anetchininbeke, east Aneityum. Extensive stands of this palm occur in the valleys and adjacent slopes in east Aneityum. 16. Lower right. Roof construction using split trunks of *Veitchia spiralis*, Anelghowhat, Aneityum.

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### Error in Notice of Membership Dues

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The meetings in Southern California will be followed by post-biennial trips to Ecuador. The post-biennial trip to Ecuador will tentatively start on Saturday, August 10, and probably run ten days/nine nights. The post-biennial tour will be offered on an all inclusive basis (including round trip airfares from Los Angeles). More later as details are finalized.