

Palm Botany in the Louisiade Archipelago, Papua New Guinea

JOHN L. DOWE
*School of Tropical Biology,
James Cook University,
Townsville, Qld 4811,
Australia*
John.Dowe@jcu.edu.au

AND

ROY BANKA
*PNG Forest Research Institute,
PO Box 314,
Lae, Papua New Guinea*
roybanka@hotmail.com



1. *Livistona woodfordii*, in coastal forest at about 50 m alt., Yeleamba, Rossel Island.

The Louisiade Archipelago is one of the remotest parts of Papua New Guinea. Although the palm flora is limited to only a few genera, there is a high degree of species endemism. On Sudest Island, the population of the tall fan palm *Livistona woodfordii* is among the most extensive for any palm in Papua New Guinea, with almost monospecific stands covering many kilometres of coastal forest.

The Louisiade Archipelago is situated in the extreme southeast part of Papua New Guinea, almost midway between the mainland and the Solomon Islands. The nearest significant landmasses are Woodlark Island, about 200 km to the north, the mainland, a similar distance to the west, and the Solomon Islands some 400 km to the east. The archipelago comprises three large islands – Misima, Sudest and Rossel – and myriad islets and coral cays. Of the main islands, Sudest (also known as Tagula) is the largest, about 60 km long by 20 km at the widest point; the smallest is Rossel, at 30 km long and 12 km wide while Misima is somewhat intermediate at about 40 km long by 10 km wide. Misima is the most populated, with about 14000 inhabitants and is also the site of one of Papua New Guinea's largest gold and silver mines, though mining operations have recently ceased. Although small aircraft regularly service Misima, the other islands can only be visited by boat.

Louisiade palms

Apart from the ubiquitous coconut (*Cocos nucifera*), betel-nut (*Areca catechu*) and sago (*Metroxylon sagu*), the palms currently recognized for the Louisiade Archipelago are not numerous (Table 1). Per land area, this makes the region one of the most palm-poor areas in Papua New Guinea. Genera, such as *Gulubia*, *Rhopaloblaste*, *Orania*, *Cyrtostachys* and *Licuala*, which are commonly encountered throughout most of lowland New Guinea, are otherwise absent. However, there appears to be a number of undescribed species, as well as some species that have been described from elsewhere but have so far not been formally recorded from the archipelago.

One possible cause of this apparent paucity, is that the islands have been visited infrequently by palm botanists or specialist palm collectors. Among the first to make palm collections was William MacGregor in 1888. MacGregor was the Administrator of the British Crown Colony of New Guinea, and apart from being an administrator and legislator, he encouraged and undertook botanical collecting in many remote parts of Papua New Guinea (Thomson 1889, van Steenis-Kruseman 1950). We are aware of no further palm collections being made until Leonard Brass collected for the 1956 Archbold Expedition. Brass (1959) visited Sudest where he ascended Mt Riu and recorded: "...a scattered emergent, pinnate palm recalled those of mountain tops in the D'Entrecasteaux Group." At Rambusa, he reported: "...as elsewhere on Sudest, palms were poorly represented." On Rossel Island he reported: "...most of the shoreline consisted of gray sand beaches, mangroves and nipa palms (*Nypa*

Table 1. Palms of the Louisiade Archipelago.

Described taxa

- Calamus hollrungii* Becc. – Sudest.
Calyptrocalyx albertisianus Becc. – Misima and Rossel.
Caryota rumphiana Mart. – Misima.
Heterospathe annectens H. E. Moore – Misima (?) and Rossel. Type: Brass 28409.
Livistona woodfordii Ridley (syn. *Livistona beccariana* Burret) – Rossel and Sudest.
Nypa fruticans Wurmb – Rossel.
Ptychosperma rosselense Essig – Rossel. Type: Brass 28408.
Ptychosperma tagulense Essig – Sudest. Type: Brass 27830.
Ptychosperma ramosissimum Essig – Rossel. Type: Brass 28474.

Collected taxa, either undescribed or undetermined

- Calamus* sp. – Rossel (Brass 27857).
Hydriastele sp. – Sudest and Misima (Banka 2018, 2019 with J.L.Dowe).
Ptychosperma sp. – Sudest (Banka 2017 with J.L.Dowe),

Cultivated palms observed

- Areca catechu* L.
Cocos nucifera L.
Metroxylon sagu Rottb.

fruticans)." Upon ascending Mt Rossel, he wrote: "...the uppermost leaf tips of two species of pinnate palms commonly came to about the level of the highest surrounding trees," and "...below the ridge crest...an abundance of a stout *Calyptrocalyx* as a substage palm." Brass's collections from the Louisiades were subsequently studied by Moore (1969) and Essig (1978), both of whom described new species using Brass's specimens as types (Table 1). One of the more interesting of Brass's collections from the archipelago was *Livistona woodfordii*, which he collected as simply *Livistonia* (sic), but this was subsequently determined as *Livistona beccariana* by H. E. Moore in 1967.

In 1972, Fred Essig and Heinar Streimann visited Misima where they collected "...*Caryota rumphiana*, a *Calyptrocalyx* sp. and an unidentified *Heterospathe*..." (Essig & Young 1981). They were unable to visit Sudest and Rossel at that time. In 1978, Essig returned to Milne Bay Province with Bradford Young. Once again an attempt was made to visit Sudest and Rossel, but the lack of transport

forced them to reconsider and subsequently to undertake some trips into the interior of the mainland portion of the province (Essig & Young, 1981).

The only other collection from the Louisiades, of which we are aware, is that by A. Gillison, who collected for the PNG Forestry Department in the late 1960s. The collection, *Ptychosperma ramosissimum* (Gillison 25399), was deposited in the herbarium of the PNG Forest Research Institute, Lae.

The Louisiades Expedition, 2001

In May 2001, the authors visited the Louisiades as part of general palm collecting activities related to a revision of *Livistona* (by JLD) and the collaborative Palms of New Guinea (PONG) Project (JLD and RB). The PONG project involves botanists from many different institutions and facilities. After a few months of planning, the expedition began with the authors meeting in Port Moresby on 22 May 2001 where some final preparations were made with regard to forestry protocols and supplies. We flew to Misima on 24 May, where we were the guests of Misima Mining Limited who provided accommodation in the mining camp complex and local land transport. At Bwagaoia, the administrative center for the Archipelago, we met with boat owner, Luke Moimoi, with whom we planned our itinerary and made arrangements for accommodation and supplies.

Rossel and Sudest Islands do not have airline connections, so the only way to reach them is by boat. Sudest lies some 80 km to the south-east and Rossel lies some 140 km east-south-east of Misima, of which much is open ocean and the remainder a maze of reefs and lagoons. As May is within a transition period between the milder wet season conditions and the south-east trades dominated dry season, it was expected that ocean travel would be relatively comfortable (severe weather can sometimes be experienced in the area). Our vessel was what is known locally as a 'banana boat'—a five meter long fiber-glass dinghy powered by a 40 horse-power outboard motor. The boat is open to the elements, and because of its shallow draft and upturned bow is reputed to handle roughish ocean conditions better than vessels with a deeper draft.

With this in mind, we set sail for Sudest Island at first light on the morning of 25 May. Although encountering some buffeting from the strengthening southeast trades, the leg to Sudest was without incident. In the open ocean sections, dolphins leaped about the bow, flying fish glided past within arms reach and the occasional turtle surfaced nearby for air. Upon leaving Misima, the

destination islands were not in view, and it was only after a few hours travelling that they appeared as specks hovering on the horizon. Gradually they enlarged until one could eventually make out the shapes of trees and other forms.

Our main destination for that day was Rossel Island. However, to take advantage of the smoother waters of lagoons and other areas protected by barrier reefs, the route takes in a swing through the complex of islands north of Sudest and also a small section of the northwest coast of Sudest. Upon passing Sudest, a small section of open ocean is crossed until the relative tranquillity of the Rossel Lagoon is reached. However, the passage into the lagoon, being very narrow, is easily missed, and our path unfortunately lay on the 'ocean' side of the reef, providing a rough trip through a two meter swell and very strong headwinds. We arrived at Rossel Island in mid afternoon, wet, salt encrusted but otherwise relieved to be on solid ground again.

Upon arrival, we arranged accommodation with the local District Officer. With formalities completed, we organized our task, and were informed that the palms that we wanted to collect were indeed within an easy walk of a kilometre or so. Accompanied by a number of 'assistants', we proceeded along a bush track until a group of *Livistonas* came into view. A short scramble up a steep 50 m slope and we were standing beneath a group of elegant fan palms, bearing infructescences with immature fruit (Fig. 1). The local villagers informed us that the fruit turned orange-red at maturity, usually in the months July–August. We identified the species as *Livistona woodfordii*. With collection of this palm our work in the Louisiades had begun.

The remaining daylight allowed us to prepare and press the specimens. The following morning saw an early start to visit some other parts of the island reported to have populations of the *Livistona*. Within the calm waters of Rossel Lagoon, we made our way to the northwestern side, where the *Livistona* appeared in the coastal forest (Fig. 2). Accompanying this was a small solitary stemmed palm, which we identified as *Ptychosperma ramosissimum* (Fig. 3). Collections were made at this location, and we continued on toward Sudest Island, the second destination some 30 km away in a direct line, but over twice that distance once the reefs and other obstacles are circumvented.

We arrived at Rambuso in the early afternoon, and made inquiries regarding the distribution of palms. Two possibilities were discussed – a long walk inland to see a few forest palms, most likely *Ptychosperma* or *Hydriastele* based on the



2. *Livistona woodfordii* growing within reach of salt spray at West Point, Rossel Island.

descriptions given by local villagers, or to continue by boat in a southeasterly direction where populations of *Livistona* were known to occur. At this point, the general subject of palms was discussed and a local villager demonstrated to us a fishing spear that had been made from the stem of the *Livistona* (Fig. 4). Reputedly, such spears are light-weight, strong and have a long life compared to spears made from other materials.

After a further two hours gliding through the rather calm waters of the lagoon, we turned yet another point and viewed what we considered to be one of the most magnificent palm vistas in Papua New Guinea. From about 30 km northwest of the most eastern point of Sudest, known as East Point, a stand of *Livistonas* stretched through the coastal forests to the southern coast of the island. The population is more or less continuous for 30–40 km.

Upon reaching East Point in the late afternoon, accommodation was arranged within the local village. The specimens collected earlier that day on Rossel were prepared and pressed. The house in which we stayed was almost completely made from palm materials. The roof was thatched with *Metroxylon*, and floors and some walls were made from the split stems of *Hydriastele* and *Ptychosperma*.

The following morning we undertook a trip into the *Livistona* forest some three kilometers north of the village. A passage was negotiated between the mangroves and a landing place near to the coast was reached. A short walk through mud and the tangle of *Rhizophora* branches and aerial roots brought us to a rocky shore. Here the *Livistonas*

were immediately dominant, with the undergrowth a carpet of seedlings and juveniles. The climb up a steep slope brought us to a ridge about 70 m in altitude. On the adjacent slopes we



3. *Ptychosperma ramosissimum* growing in stunted coastal forest at about 50 m alt., West Point, Rossel Island.



4 (above). Villager displaying a fishing spear made from the trunk of *Livistona woodfordii*, Rambuso, Sudest Island. 5 (upper right). *Ptychosperma* sp., north of East Point, Sudest Island, in rainforest at about 70 m alt. 6 (lower right). *Hydriastele* sp., north of East Point, Sudest Island, in rainforest at about 70 m alt.

encountered what appeared to be an undescribed *Ptychosperma* (Fig. 5), an undetermined but probably described *Hydriastele* (Fig. 6), and the climax of the *Livistona* forest. We chose specimens of each palm to collect, and completed the task in a few hours. By early afternoon, we were back at East Point, and in a forest inland from there collected a specimen of a solitary-stemmed cirrate *Calamus* distinguished by a spineless knee, and since determined as *C. hollrungii* (W.J. Baker, pers. comm.).

At mid afternoon we prepared the dinghy for the return trip to Misima. The breezes were rapidly freshening, and it was on the sector between Sudest and Misima that we encountered rather rough seas with a swell to three meters and a strong current. It is at such moments that the fragility of life is contemplated, and the limit of one's own mortality seriously considered. The gold mine on Misima is a dominant landmark – by day a huge scar on the side of one of the island's



highest mountains and by night a blaze of lights. It was by this beacon that we reached our destination at Bwagaoia in the early evening darkness, albeit a bit dazed and bruised from the roughness of the final few hours of the trip. Once safely upon land, we organized our accommodation at the mining camp complex, and enjoyed an evening of stillness, although when our heads hit the pillows the heave of the ocean swell was relived. We estimated that we had traveled almost 600 km in our trusty dinghy over a period of three days. Whether that was some kind of record we were not sure, but it certainly felt like a marathon effort to us land-lovers.

The following day, being a Sunday, was a day or rest and recuperation. However the next day we were once again in action. This included a climb up Mt. Sisa to an altitude of about 400 meters. Palms were rather rare; we encountered only an occasional *Caryota rumphiana* and the same *Hydriastele* that we saw on Sudest. We collected the latter, as very few palm collections have been made on Misima. Our guides related that other species also occurred on the island, a putative *Ptychosperma* according to their description or perhaps Essig and Young's *Heterospathe* or *Calypstrocalyx*, but these palms were in the deep interior of the island and only accessible after a full day's walk.

Upon preparing and pressing the newly collected specimens, and packing the collections for the flight to Lae herbarium, we planned our departure from the Louisiades for the next day, 29 May. We had certainly achieved most of our objectives but further collections of those species, which we did not find, would have to wait for another time.

Acknowledgments

We would like to thank Misima Mines Limited for providing accommodation, air transport from the island and other logistical support while on Misima. Luke Moimoi is thanked for safely delivering us to our chosen destinations in his trusty dinghy, and arranging accommodation on Sudest Island. Jim Silu, of Forestry Department, Alotau, is thanked for arranging contacts with people on Misima. Funding for the expedition was provided by the Pacific Biological Foundation as part of a grant to JLD.

LITERATURE CITED

- BRASS, L. J. 1959. Results of the Archbold Expeditions. No. 79. Summary of the fifth Archbold Expedition to New Guinea (1956-1957). Bull. Amer. Mus. Nat. Hist. 118: 1-70.
- ESSIG, F. B. 1978. A revision of the genus *Ptychosperma* Labill. (Arecaceae) Allertonia 1: 415-478.
- ESSIG, F. B. AND B. E. YOUNG. 1981. Palm collecting in Papua New Guinea. III. Papua. Principes 25: 16-28.
- MOORE, H. E. JR. 1969. New palms from the Pacific, III. Principes 13: 99-108.
- THOMSON, B. H. 1889. New Guinea: narrative of an exploring expedition to the Louisiade and D'Entrecasteaux Islands. Proc. Roy. Geogr. Soc. Lond. new series 11: 524-542.
- VAN STEENIS-KRUSEMAN, M. J. (1950). Malaysian plant collectors and collections. Fl. Males. 1: 3-639.