

favorite Malagasy palms. Large amounts of mature seed have been distributed from the Royal Botanic Gardens, Kew, and are growing vigorously in places as far apart as Hawaii and London. In its home range, the palm seems to be restricted to a very small area. Despite a search of the area, I only saw it in that single river. Even considering the large numbers there, and the fact that it is not used by local people, it must be considered "vulnerable." Any serious upstream pollution or drying up of the river could wipe out the entire population.

### ***Ravenea musicalis* Beentje, sp. nov.**

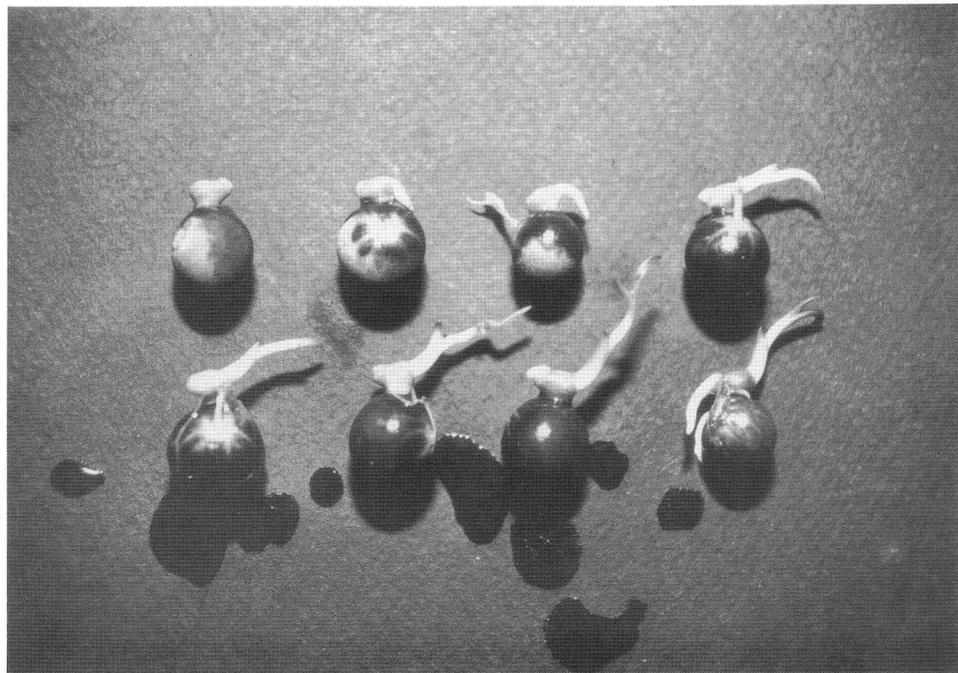
*R. rivulari* affinis sed ligno molli, inflorescentibus maribus semel ramosis, inflorescentiarum feminearum rachillis paucioribus, fructu semineque majore recedit; a congeneribus diversa habitu atque habitatione, germinatione singulari distinctissima. TYPUS: Madagascar, pagus Belavenona, flumen Andriambe, *Beentje & Andriampaniry* 4611 (holotypus K; isotypi BH, MO, P, TAN).

Solitary, unarmed dioecious palm to 10 m tall, of which 0.5–2.5 m below the water; trunk ventricose, DBH 30–40 cm, base (at water level) to 50 cm across, near the crown ca. 11 cm across, internodes here 0.5 cm, nodal scars 0.5 cm; bark pale brown, soft, with internodes 1–2 cm; wood soft, cream-colored, fibrous, without hard fibers. Leaves 14–16, spiral, porrect to spreading, arching, held on edge in distal half, with stiff or arching leaflets; sheath 36–41 × 13–20 cm, adaxially orange, abaxially proximally orange, distally green, with thin gray tomentum; fibers few; petiole 15–19 × 3.5–5 × 1.5 proximally, glabrous, keeled; rachis 132–178 cm, in mid-leaf 1–1.5 cm across; with little abaxial tomentum; leaflets in one plane, regular (interval in mid-leaf 2–2.5 cm), stiff, 59–63 on each side of the rachis, the proximal 36–47 × 0.5–1.5 cm, median 42–53 × 1.6–2.4 cm, distal 10–30 × 0.4–1.3 cm;

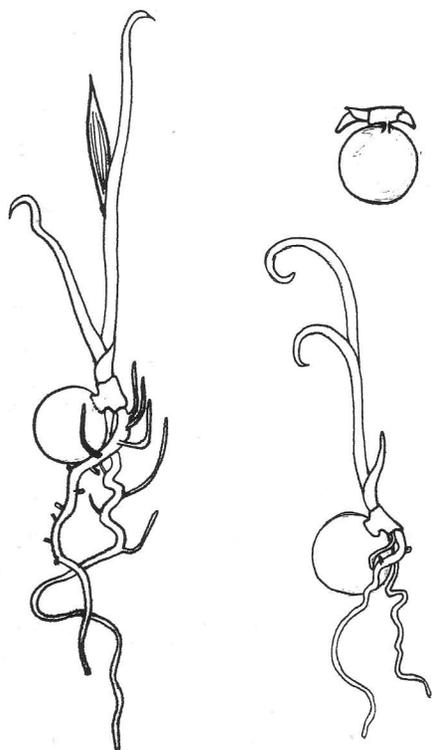


3. Close-up of crown with fruiting branches.

ramenta none or few, large, basal on midrib and outer main veins; main veins 4. Staminate inflorescences multiple in 5's, the individual inflorescences to 115 cm, branched to 1 order, pendulous in later stage; peduncle 36–38 cm, proximally 1 cm across, distally 0.6–0.7 cm across; bracts 29–30 cm, 38 cm, 64 cm (in 2), 84 cm (in 5), 80 cm (in 10); rachis 54 cm, with many dense rachillae; rachillae 7–24 cm, 1–1.5 mm across; flowers spaced; flowers unknown. Pistillate inflorescence solitary, spreading, 105–125 cm, branched to 1 order, the axes green; peduncle 48–52 cm, proximally 3–5 × 2–2.5 cm, distally 2–3 × 1.3–2 cm; prophyll 10 × 4 cm; peduncular bracts 20–24 cm (inserted at 0–2.5 cm), 49–52 cm (inserted at 3–3.5 cm), 82–83 cm (inserted at 4–9 cm), 100–103 cm (inserted 10–24 cm); rachis 39–55 cm, with 58–68 branches; rachillae 9–42 cm, the proximal spreading, the distal porrect, the base



4. Germination: the four upper stages are found within closed fruit, the four lower stages are found under water.



proximally flat,  $0.6-1.5 \times 1$  cm, in fruit 3-3.5 mm across; pedicels 0.5 mm; calyx connate for 1 mm, 1.5 mm wide, free lobes  $1.7-2.6 \times 1.6-2$  mm, ovate, acute; petals in fruit only present as fiber remnants, ca. 2.5 mm long. Fruit orange,  $17-23 \times 14-19$  mm, one-seeded; stigmatic remains subapical to lateral. Seed brown, 10-14 mm across, hard, seedcoat black, 0.2 mm thick; endosperm solid, homogeneous. Seedling with 3-4 scale leaves: the first small, the second, third and fourth to 9 cm long and with curving tips; eophyll pinnate.

*Distribution.* Madagascar, only known from one site.

*Specimens Examined.* Belavenona, R. Andriambe, March 1992 (fr.), *Beentje & Andriampaniry 4611* (type); idem (old stam.), *Beentje & Andriampaniry*

5. Germination: from within the closed fruit (upper right) to the first emerging leaf (left).



6. Submerged seedlings, with young emergent plants, in fast-flowing water 7. Seedlings in cultivation at Kew.

4612; idem, Dec. 1992 (y. fr.), *Beentje* 4756.

*Ravenea musicalis* grows in 0.5–2.5 m deep, flowing water and always leans over towards deeper water. The seeds sprout within the closed fruit; the fruits float and rot and then the seeds sink. The palm also grows as a rheophyte on submerged rock pavements, but is then sterile and only grows to a height of 1 m. The local name is “Torendriky” (“submerged trunk”); there are no uses known to local people.

*Note.* The species is distinct from all other *Ravenea* species by the absence of hard fibers in the outer wood; by its habit and habitat; and by the seed sprouting within the unopened fruit. Its nearest relative is probably *R. rivularis*, from which it differs by the staminate inflorescence, branched to one order only, by the pistillate inflorescence, with much fewer rachillae, and by the much larger fruit and seed.

In cultivation in Antananarivo and at Kew a few curious characteristics became apparent. The second and third scale leaves curve through 180–270° at the apex at

an early stage in development, which is perhaps a feature to aid establishment in fast-flowing water, since they may catch on protuberances on the riverbed. A similar strategy might be employed by the secondary rootlets, which sprout in large numbers and grow towards the light, rather than in the direction in which the main roots grow (i.e., downwards). Remarkably, the first true leaves are floppy, and the leaflets soft and pendulous (Fig. 7).

### Acknowledgments

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