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## Ravenea in Madagascar

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*Ravenea* is becoming popular again. In the latter part of the 19th century, *R. hildebrandtii* was much sought after for the drawing room; nowadays this species is very rare in cultivation, and our more climatically advantaged members proudly grow their *R. rivularis*. Several entrepreneurs are trying to obtain seed of the rare *R. xerophila*, which would thrive in rather arid climes. However, the bulk of the genus is still unknown to the palmeteers' world at large, and that is sad, because there are some beautiful species as well as some very interesting ones. The genus is restricted, in the wild, to Madagascar and the Comoro Islands; your editors have described the Comoro species in this journal (Dransfield and Uhl 1986) and in a recent article I have described the amazing aquatic *Ravenea* (Beentje 1993). In 1995, John Dransfield and I hope to publish "Palms of Madagascar" which will contain full descriptions of the species, identification keys, and drawings as well as photographs. In this article I'd like to give you an overview of the genus.

### Diversity

One of the more amazing things about *Ravenea* is the sheer diversity of the species. Their habit ranges over a wide spectrum, including small undergrowth palms (*R. hildebrandtii*), short and squat palms (*R. louvelii*), slender middle-sized trees (*R. madagascariensis*) and forest canopy giants with bulging trunks (*R. robustior*); habitats include dense lowland rain forest where the palm collects litter (*R. albicans*), littoral and montane forests (*R. sambiranensis*), ravines in rather dry areas (*R. glauca*), river banks in dry areas (*R. rivularis*) and hilltops in arid areas (*R. xerophila*).

In fact, the genus itself is a member of a closely knit group of genera, the tribe Ceroxyleae, from a diversity of continents. There is *Oraniopsis* from Queensland, Australia; both other members of the tribe grow in South America; there is *Juania* from 'Robinson Crusoe' (Juan Fernandez) Island, and

the Andean wax palms, *Ceroxylon*, occur in the high mountains of the Andes.

There used to be a fifth member of the tribe, *Louvelia*, also from Madagascar; however, John Dransfield and I have re-found the two most mysterious *Louvelia* species, and some intermediates, and it has turned out that there are no true differences between *Ravenea* and *Louvelia*. The two genera form a continuum, with the species at the opposite ends of the spectrum very different; if just the extremes were known, you would certainly put them in different genera. But, if you look at the other species, you can form a chain, of which the links are formed by species which are quite close to each other—and so you can link the extremes, making this a single genus. Between the bulk of the genus *Ravenea* and the other genera of this group, however, there are differences which cannot be bridged by intermediates. And so it goes.

### History of the Genus

One of the main difficulties in the early days of *Ravenea* taxonomy was the scarcity of collections and the sex question. Species were described based on one or two collections, and often from very scrappy ones; this was the reason why early keys to the species were based on the strangest of characters, such as the keel of the leaf rachis, or little black hairs on the petiole (probably a fungus). By 1945, when the Flora of Madagascar and the Comoros was published (Jumelle and Perrier 1945), nine species had been recognized in *Ravenea* and three in *Louvelia*, and all but one of these have survived my critical revision (Beentje 1994).

Several new species have come to light since 1945. Dransfield and Uhl (1986) described the imposing *Ravenea moorei* from the Comoro Islands. John Dransfield found a new species during his field work in the late 1980's, which was intermediate between *Ravenea* and *Louvelia*. During my own field work in Madagascar in 1991–1993, three more new species came to light, one

of which was described in this journal (Beentje 1993).

The main difficulty during my revision of the genus was the distinction of taxa which are quite close to each other, such as *R. madagascariensis*, *R. latisecta*, and *R. sambiranensis*. In the field these seemed quite distinct, but the types, the specimens on which the first descriptions were based, were scrappy, or even completely missing—such as the type of *R. latisecta*—in which case I had to go by the rather hazy published description. The fact that this is a dioecious genus, with male and female trees, made the identification of scrappy specimens difficult, and so was the linking of the females with the appropriate males. So some mysteries remain; probably a good thing, as mysteries are the spice of life!

### List of Species

**Ravenea albicans** (Jum.) Beentje (formerly *Louvelia albicans* Jum.)

“Hoza-tsiketra” (Fig. 1)

This used to be a *Louvelia*, as well as a mystery. The type had been collected by Perrier de la Bâthie in the Masoala Peninsula, but without an exact locality. The date must have been circa 1925. This species is immediately recognizable by the white underside to the leaflets (hence the specific name) and a kind of zebra-stripping on the leaf rachis. It should be quite unmistakable in the field—the problem was, which field? None of the botanists who have collected in the Masoala in recent years had seen it, and this includes Dransfield, who had searched for it. The original description of 1933 says “common between Fenerive and Antalaha”, casually mentioning an area of some 250 miles of coastline. After a year of field-work I was beginning to despair about this species. Then, in April 1992, John Dransfield and I were working in a forest near Mananara when John called out, and started dancing—he had red-discovered it, ending a sixty-five year old mystery. It is a 3–6 m tall undergrowth palm with litter-

trapping sheath bases and the typical ‘shuttlecock’ crown of many *Raveneas*. The male inflorescence is hidden among the sheath bases, but we found a plant in old pistillate inflorescence, and this stuck out from the sheaths. We still have not seen the fruit, but some seedlings growing under the tree had the characteristic white under-surface of the leaf. One of the rarest *Raveneas*, growing in the wettest rain forests of the country.

**Ravenea dransfieldii** Beentje

“Ovotsarorona” (Fig. 2)

This species was really the missing link between *Ravenea* and *Louvelia*, and the link was found by John Dransfield on his first trip to Madagascar in 1986. This medium-sized palm grows in lowland rain forest in eastern Madagascar. It has a hard layer around the seed as well as the condensed female inflorescence of *Louvelia*, but only a single seed per fruit, and a male inflorescence branched to two orders, just as in *Ravenea*. So far, it is only known from four sites. Young leaves are used for making high-quality hats.

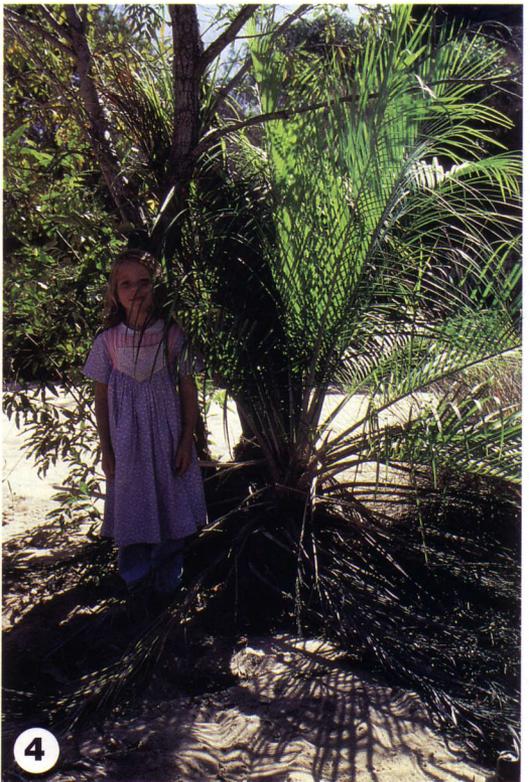
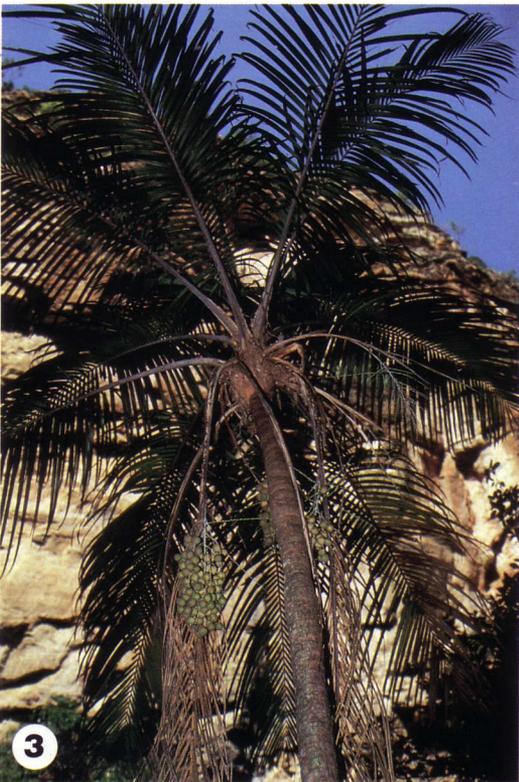
**Ravenea glauca** Jum. & H. Perrier

“Sihara” (Figs. 3,4)

A very graceful palm, which would probably do quite well in cultivation; in the wild, it occurs along streams and in ravines in the drier (but not arid) parts of southern-central Madagascar. The trunk is slender, the crown consists of 14–20 slightly arching leaves, and the leaflets have a slightly waxy layer on the underside, which gives the species its name. I have seen it growing on sandstone walls of ravines, in tiny cracks, but also in dry sandy riverbeds; both sites seemed quite dry, but probably get wet at intervals. The original description reports vast forests of this species in the Andringitra Mountains of central-southern Madagascar (again, on their drier slopes), without any undergrowth. I find this hard to believe, but

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1. *R. albicans*. Note whitish under-surface of leaflets. Photograph by John Dransfield. 2. *R. dransfieldii*. The hanging leaflets are characteristic. Photograph by John Dransfield. 3. *R. glauca*. A middle-sized specimen, in young fruit, in an Isalo canyon. 4. *R. glauca*. A small specimen, but with old inflorescences. Rosie Beentje lends scale.



I must admit my two attempts to reach these mountains failed. It would be a wonderful sight, if it were true.

**Ravenea julietiae** Beentje

“Vakapasy” (Figs. 5,6)

An elegant palm, which I named after my wife, who first pointed it out to me. After I had drawn up the description, I discovered that a rather meager collection by Cours, dating back to 1951, was in fact the same species. Male trees may resemble both *R. madagascariensis* and *R. sambiranensis*, but the female trees are unmistakable when they are in flower or fruit; the peduncle, the stalk on which the inflorescence is borne, is about twice the length of the leaves and may be up to 4 meters long. I have found it in lowland rain forest, or its remnants, along the east coast; the outer wood is used in construction, and hollowed-out trunks are used as irrigation pipes.

**Ravenea krociana** Beentje

“Vakakabe” (Fig. 7)

A majestic canopy tree palm, up to 30 m (100 ft) tall, only known from lowland rain forest from the far southern tip of Madagascar. It rather resembles *R. robustior*, which also occurs in that area, but the fruit is much larger (over an inch across), the wood is very light, and female flowers have ten staminodes. Male flowers are still unknown, but by the time this article is published I'll be in Madagascar once more, looking for them. The species is named after Ray Kroc, founder of the McDonald's Restaurants, the organization which funded the 4-year project to study the palms of Madagascar.

**Ravenea lakatra** (Jum.) Beentje (formerly *Louvelia lakatra*)

“Lakatra”

A medium-sized, slender palm of the eastern rain forests, with very hard wood; one of its local

names can be translated as “cannot be cut down by an army”. The leaf sheath and petiole are both quite long and also very hard, but the most distinctive character is the seed, which is black and carries a sharp point and is covered by a hard layer; there can be one, two or three seeds per fruit. The male inflorescence was first found in 1993; the search for *lakatra* is documented in earlier numbers of *Principes*. Young leaves are used for making high-quality hats.

**Ravenea latisecta** Jum.

(no local name known)

This still remains one of the main riddles of the genus. I have been unable to find the type (the only certain collection of this species—dating back to 1912), either in Paris or in any other herbarium, and this hampers my interpretation of the species. The original description highlights the leaflet width (over 5 cm wide), and I did find a population at the type locality which agrees with this and other characters. However, the male inflorescences were multiple, not solitary as Jumelle described them; I was unable to find any female trees. I believe this is close to, or even the same as, *R. madagascariensis*, but until the type comes to light, or until female trees are found, this will remain a mystery.

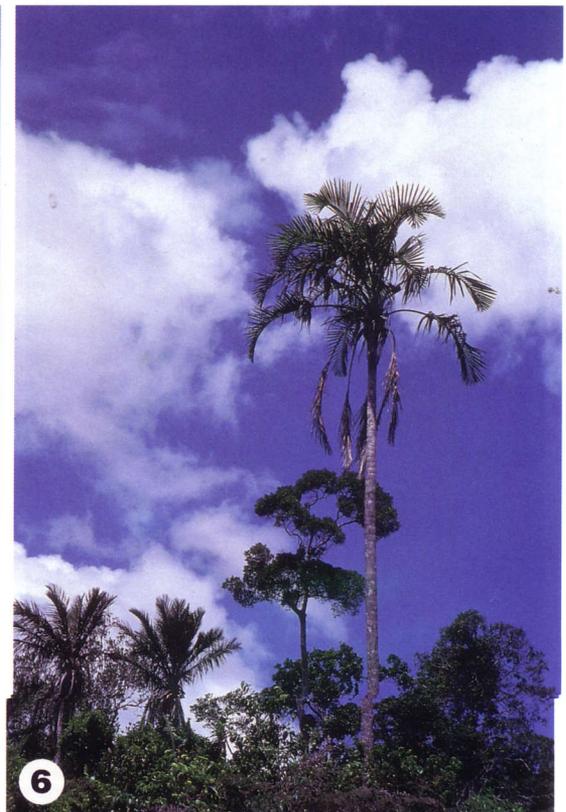
**Ravenea louvelii** (Jum. & H. Perrier) Beentje  
(used to be *Louvelia madagascariensis*; upon its being transferred to *Ravenea* I had to change its epithet, since ‘*madagascariensis*’ already existed in *Ravenea*)

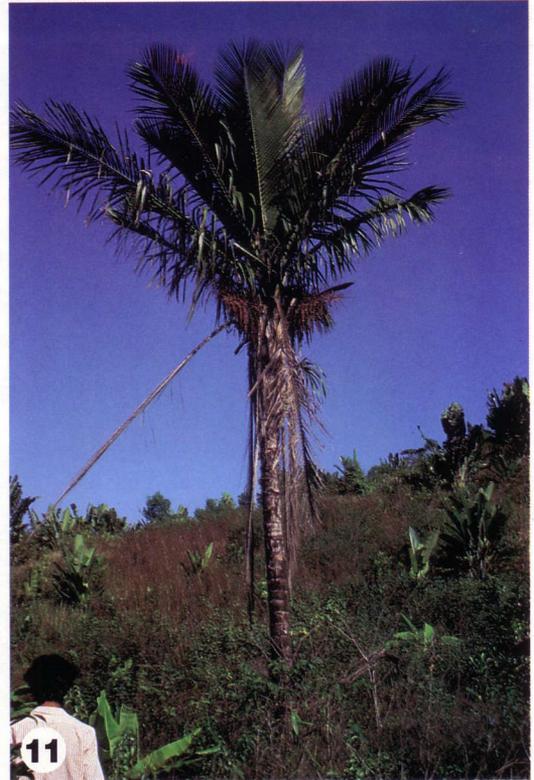
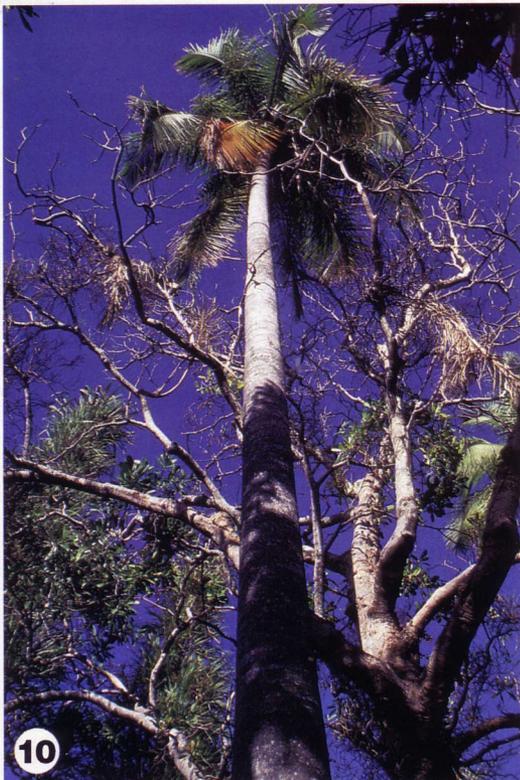
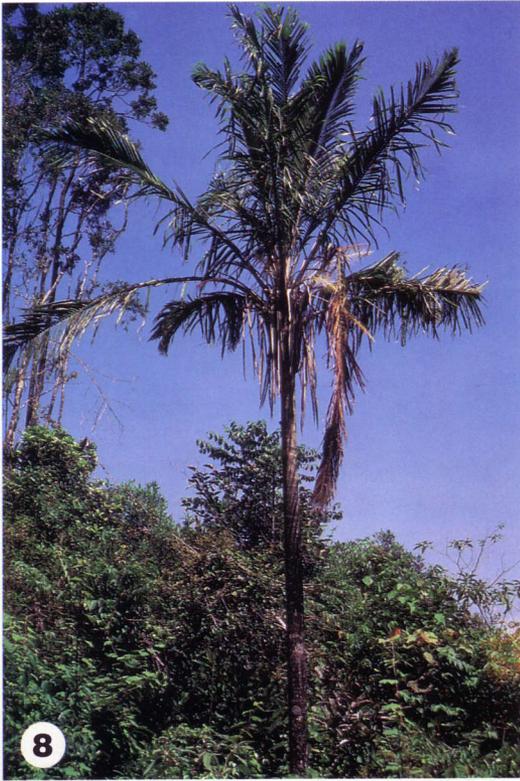
“Lakamarefo”

This is the archetypal *Louvelia*: squat, with marcescent leaves and a trunk covered in tattered leaf bases, and very condensed inflorescences which are almost hidden by the leaf bases. It is still only known from the single rain forest site where it was first found over eighty years ago, and it looks rather mysterious as well as quite archaic.

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5. *R. julietiae*. A female tree, with the extremely long fruiting stalks. 6. *R. julietiae*. A male tree, with *R. robustior* in the background. 7. *R. krociana*. Even the fruits are enormous—for a *Ravenea*, that is.





**Ravenea madagascariensis** Becc.  
"Anivo" (Fig. 8)

One of the most widespread species of the genus and one of the first to be described, this is quite common all over the eastern escarpment and parts of the central plateau, and has the 'shuttle-cock' crown which makes one think '*Ravenea*' straight away. There is no true distinction between typical *madagascariensis* and the variety *monticola*, and so this variety has now been 'sunk' into, or declared the same as, *madagascariensis* itself. These are handsome trees of rain forest or slightly drier hill forests, and can be found from sea level to 1,700 m (6,000 ft) on both rich forest soils and quite leached, almost sandy soils with just a thin layer of humus. The outer wood is used for house walls and floors.

**Ravenea musicalis** Beentje  
"Torendriky"

First described in *Principes* of October 1993. A true aquatic with a bottle-shaped trunk, whose seedlings start off under water—the only palm in the world known to do this. It is known only from a single river, and the total number of trees is about 450. Probably closest to *R. rivularis*.

**Ravenea nana** Beentje

This is an enigma, and the only Madagascar *Ravenea* I have not seen in the field. The only habit description I have seen is "small palm, 3–4 meters". I don't know whether the male inflorescences are solitary or multiple, so I cannot decide on its affinities, but it looks rather like *R. hildebrandtii* from the Comoro Islands. I believe this is a high-altitude species from health vegetation or low-canopy forest on rocky sites. It has been found five times, in the mountains of eastern Madagascar, but has not been seen since 1963.

**Ravenea rivularis** Jum. & H. Perrier  
"Vakaka" (Figs. 9,10)

This is a very handsome *Ravenea*, which grows along rivers in southern-central Madagascar in

what is really a rather dry area. It has a full crown of slightly arching leaves, emerging from an imposing, tall, pale grey trunk which may be swollen halfway up. It is not common in the wild, but where it grows it can often be found in large stands, along rivers or swamp margins, and always in permanently wet sites; I always get my feet wet when collecting this palm! It is becoming common in cultivation, and growers might be interested to know that all seed almost certainly derives from the same population where Perrier de la Bâthie collected the type specimen in 1924.

**Ravenea robustior** Jum. & H. Perrier  
"Munimuni" (Fig. 11)

A truly majestic palm of lowland and sub-montane rain forest of the east coast. To stand at the foot of one of these giants and look up at the crown, some 30 meters (100 ft) above you, is an experience which fills one with awe. The base of the tree is usually bulbous and up to a meter (3 feet) across; the trunk is swollen halfway up, and the leaves are held in the familiar "shuttlecock" mode. This species is quite widespread in the wetter forests of Madagascar; it is cut down for its palm-heart, and planks are made from its outer wood, which is very hard and termite resistant. A smaller form with a slender trunk grows in the open where forest has disappeared, but I cannot find enough differences to separate it off as a species or even as a variety.

**Ravenea sambiranensis** Jum. & H. Perrier  
"Mafekely" (Fig. 12)

A very widespread species, and very variable too: it can be a small, slender tree on poor soils of the peaks of the high mountains of the north (this form used to be *Ravenea amara*) and in the dry forests of the west; it may be a medium-sized tree on the east coast or (rarely) a forest giant in the Sambirano; and it can even grow as a small, almost shrubby palm on white sand near the sea. This group caused me many problems, and there

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8. *R. madagascariensis* at Perinet. Photograph by John Dransfield. 9. *R. rivularis* in the type locality, neatly in a row next to a small stream. 10. *R. rivularis* in the type locality. 11. *R. robustior*, the smaller open-air form.



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were times when I felt there were at least three species involved; the white-sand or coastal form was going to have the name "littoralis", as it seemed so very striking. But then I found trees that looked like "littoralis" in wet forest at medium altitudes, and the more collections I made, the more the distinctions blurred; even varieties seem unjustified. The outer wood is used for house walls and floorboards, and the palm-heart is sometimes eaten, though it is said to be somewhat bitter; hence its name, Mafekely (from *mafa*, bitter, and *kely*, little, a bit). A handsome palm which would probably do well in cultivation, especially the littoral form which grows on very nutrient-poor soils not far from the sea; this form stays more compact than the other, more inland, forms.

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12. *R. sambiranensis*. A large specimen in the drier western parts of Madagascar. Photograph by John Dransfield. 13. *R. xerophila*. A full-grown specimen.



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**Ravenea xerophila** Jum.

"Anivona" (Fig. 13 and Back Cover)

This medium-sized palm of the far south is beautiful, with its pale trunks and gracefully arching leaves. Its habitat is the dry thorn forest, where it seems to favor hilltops—I believe this may allow it to catch a bit of moisture from the clouds. Soils were poor, gritty sands with lots of rocks. The upper trunk is clothed in leaf base remnants and Perrier, in 1932, reported epiphytic orchids growing among these sheath bases. In 1992 I saw a population of *xerophila*, and I can confirm that a large orchid seems confined to this very specialized habitat. Fibers from young leaves are used in making hats and winnowing baskets. This wonderful palm would make an excellent species for drier areas, but careless collecting could wipe out the entire population. This is a truly endangered species.

**Acknowledgments**

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