Notes on the Genus *Ammandra* (Palmae)

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1. *Amandra decasperma* in secondary forest at the Magdalena river valley.

The genus *Ammandra* is recorded from the inter-Andean valley of the Magdalena river in Colombia. The new finding supports the inclusion of *A. dasyneura*, from the northwestern Amazon of Colombia and Ecuador, under *A. decasperma*, from the Pacific lowlands of Colombia.

The genus *Ammandra* was described by Cook (1927), based on a specimen collected by himself near Buenaventura, on the Pacific coast of Colombia. The genus is a member of the strange subfamily Phytelephantoideae, the vegetable ivory palms, and differs from *Phytelephas* mainly in its staminate flowers, which have a well-developed receptacle that is the most conspicuous part of the flower, and small stamens scattered all around its outer surface. The stamens are numerous, and look like sand grains dusted over the prismatic receptacle. The name *Ammandra* alludes to this character: it is composed of the Greek roots *ammos* (sand) and *andros* (man, in reference to the stamens).

Ammandra decasperma, the species described by Cook, remained as the only member of the genus until a second species, from Amazonian Ecuador, was described by Balslev and Henderson (1987) as *Ammandra natalia*, a name honoring Natalie Uhl. This species differs from *A. decasperma* in many respects, particularly its larger size, erect stem up to 5 m tall, long inflorescences, and staminate flowers with rounded receptacle and long stamens.

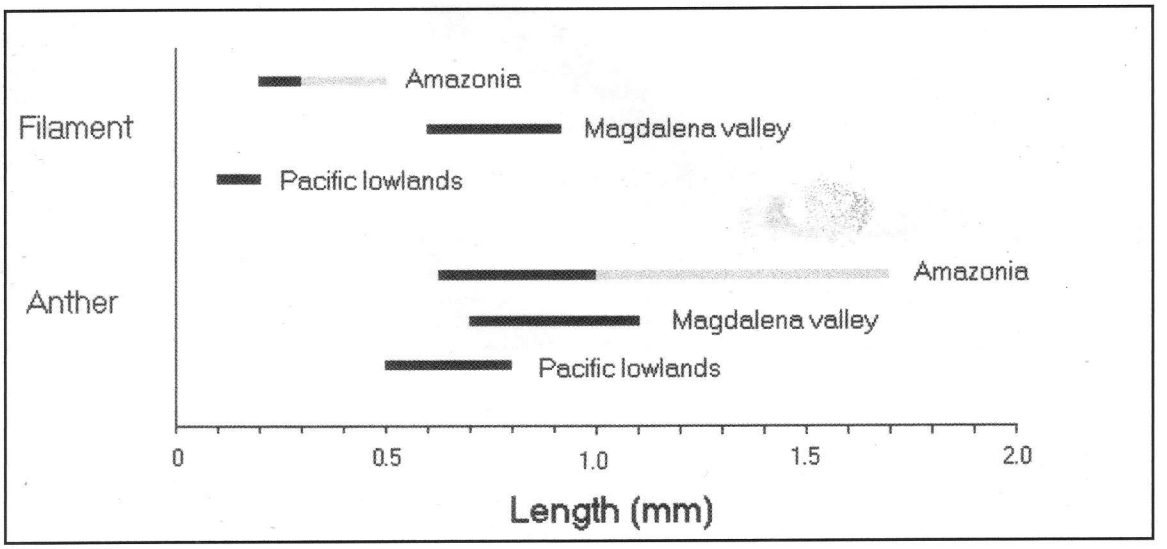
Shortly after the discovery of *Ammandra natalia*, Barfod (1991) published his monograph of the subfamily Phytelephantoideae. In this work there were two significant changes concerning the genus *Ammandra*: first, *A. natalia* was transferred to a genus on its own, *Aphandra*, separated from *Ammandra* by its staminate flowers with an elongated receptacle that forms a pseudopedicel; and second, *Phytelephas dasyneura*, a species described by Burret (1930), was shown to belong in *Ammandra*, and was accordingly named *Ammandra dasyneura*.

According to Barfod, *Ammandra dasyneura* differs from *A. decasperma* mainly in the larger number of stamens (800–1200 vs. 300–500), with longer filaments (0.5 vs. 0.1–0.2 mm) and longer anthers (1–1.7 vs. 0.5 mm). These differences, faint as they might seem, were reinforced by the isolation of both species on either side of the Andes. *Ammandra decasperma* was known only from the Pacific lowlands of Colombia, west of the Andes, whereas *A. dasyneura* was known from the northwestern Amazon in Colombia and Ecuador, east of the Andes. No populations of this genus had been found in the inter-Andean valleys in between.

During recent field work in central Colombia, we found a population of *Ammandra* in the wet middle valley of the Magdalena river (Fig. 1). As this valley lies deep between the Central and Eastern Andean cordilleras, in an area intermediate between the ranges of *A. dasyneura* and *A. decasperma*, the finding was particularly interesting. Thus, we have reassessed the differences between the two species, under the light of the new discovery.

The populations of *Ammandra* from the Magdalena river valley are vegetatively similar to both *A. decasperma* and *A. dasyneura*, which are themselves undistinguishable in habit or foliage. Counts of the number of stamens of the new population gave a figure filling the gap between

2. Length of filament and anther in populations of *Ammandra decasperma* from both sides of the Andes and from the inter-Andean valley of the Magdalena river. Dark lines correspond to specimens examined by us (cited in the text); light line corresponds to measurements cited by Barfod (1991).



A. dasyneura and *A. decasperma*, 440–1321 stamens per flower. Measurement of anthers and comparison with those of specimens of *A. dasyneura* (*Bernal & Galeano 1411*, *Balslev 62070*) and *A decasperma* (*Bernal et al. 1073*) at the National Colombian Herbarium, COL, showed that the ranges of anther length mostly overlap, whereas there is a continuum in filament length (Fig. 2). Interestingly, the length of the filament in the new population is not intermediate between those of *A dasyneura* and *A decasperma*, but it is slightly larger. The difference, however, is small and it could hardly be used as an argument to keep two separate species or subspecies or, even less, to recognize a third species. On the contrary, our study of the specimens has shown that there is variability in anther size within each purported species, particularly *A. dasyneura*. Thus, for example, the specimen *Bernal & Galeano 1411* from Colombia has shorter anthers than *Balslev 62070* from Ecuador (0.6–0.8 vs. 1.0 mm), and the first figures are lower than the range given by Barfod (1.0–1.7 mm).

Thus, the finding of the new population in the Magdalena river valley indicates that *Ammandra decasperma* is better regarded as a species with its distribution range separated by the Andean mountains into three isolated units. This is particularly interesting in biogeographical terms, as the seeds of *Ammandra*, dispersed by rodents (Barfod 1991), are not suited for long distance dispersal. Thus, the currently isolated populations are probably the result of a former wider distribution fragmented by the Andean upheaval (Barfod 1991). Since the upper Magdalena valley became isolated from the Amazonian lowlands by the late middle Pliocene (ca. 3.6 million years ago) (Hoorn et al. 1995), it is intriguing that palms in the three areas have diverged so little. A possible explanation for this is that the populations east of the Andes may have had intermittent contact with those from the Magdalena river valley across the lower passes of the Andes (e. g. the one at 3° 18′ N, which is now at ca.1700 m over sea level) during the warmer interglacial periods of the Quaternary, when suitable ecological conditions for *Ammandra* may have been found at higher elevations than they are today. Thus, for example, during the last interglacial that probably started about 130,000 years ago, the climate on the Eastern Cordillera seems to have been slightly warmer than it is today (van der Hammen 1974). Populations of *Ammandra* from the Magdalena river valley, in turn, may have been in contact with those from the Pacific (or may even have migrated there) around the northern end of the Central and Western Cordilleras, as are still today many species of plants and animals. However, no populations of *Ammandra* have been found in that area, although it has been well explored for palms (Galeano & Bernal 1987). Another possibility for the scarce diversification of the isolated populations is that evolution in this group proceeds at a low rate.

Ammandra decasperma O. F. Cook, J. Wash. Acad. Sci. 17: 218. 1927. Type: Colombia. Valle del Cauca: Buenaventura, 26 May 1926, *Cook and Baker 153* (holotype, US, n.v.).

Phytelephas decasperma (O. F. Cook) Dahlgren, Field Mus. Nat. Hist., Bot. Ser. 14: 231. 1936.

Phytelephas dasyneura Burret, Notizbl. Bot. Gart. Berlin-Dahlem 11: 5. 1930. Type. Colombia. Caquetá: Getuchá, Río Orteguaza, 30 Jul 1926 *Woronow & Juzepczuk 6335* (holotype B, destroyed; lectotype (Barfod 1991), LE, n.v.).

Ammandra dasyneura (Burret) Barfod, Opera Botanica 105: 43. 1991.

Solitary or clustered dioecious palm, with stems short and subterranean, or prostrate and up to 1.5 m long and 25–35 cm in diameter, usually decaying at the older portions. Leaves 8–20 erect or arching; sheath 1–1.7 m long, strongly fibrous, most of it appearing like the petiole; petiole cylindrical, 1–2.4 m long, 2–2.5 cm in diameter, green; rachis 3.3–4 m long, with 40–62 pinnae; middle pinnae opposite, to 85 cm long and 5 cm wide, glabrous, with a prominent submarginal vein on either side of the midvein. Inflorescences interfoliar, the staminate up to 1.4 m long; peduncle 30–75 cm; peduncular bract 35–50 cm long; rachis 30–92 cm long; rachillae 45–90, each with 6–9 flowers 0.5–3 cm long, the proximal ones larger and with more stamens; perianth obscure, hidden by the enlarged receptacle, the latter making the most conspicuous part of the flower; receptacle prismatic, to 1.5 cm long, with a small, central pistillode; stamens 300–1321; filaments 0.1–0.9 mm long; anthers 0.5–1.7 mm long. Pistillate inflorescence with peduncle to 30 cm long; peduncular bract 15–30 cm long; pistillate flowers 6–10 densely arranged in a head on a short rachis 1–2.5 cm long, each flower up to 25 cm long, with 7–10 narrow tepals to 10 cm long; ovary with 6–10 locules; style to 7 cm long; stigmas to 5 cm long. Infructescence 20–25 cm diameter, with 3–10 fruits. Fruit depressed-globose, 10–12 cm diameter, with woody spiny projections to 1 cm long; seeds 6–10, wedge-shaped, with two flat sides, the distal surface convex, 4.5–5 cm long, 3–4 cm wide, 2.2–3 cm along the tangential face. (Figs. 1, 3, 4).

3 (left). *Amandra decasperma*, habit. 4 (right). *Amandra decasperma*, Detail of the staminate inflorescence.

SPECIMENS EXAMINED (only those from the new locality are cited). COLOMBIA. Boyacá: Municipio de Puerto Boyacá, Puerto Pinzón, on río Ermitaño, 6° 03′ N, 74° 14′ W, 450 m, Jan 2000, *Ramírez & Morales s.n.* (COL); 2 Nov 2000, *Bernal et al. 2506* (COL, HUA, NY), *2507* (COL, HUA).

At the Magdalena river valley, *Ammandra decasperma* is apparently restricted to a small area at the northern foothills of the Serranía de las Quinchas, a small mountain range of the Eastern Cordillera of the Andes. At this area, the species is abundant in primary and secondary wet forest, with a density of 540 and 297 adult palms per ha in disturbed primary forest and secondary forest, respectively. As in other areas of its range, at this locality *Ammandra* grows also on hilly terrain. Flowering takes place throughout the year, but peaks between June and August (G. Ramírez & I. Morales, unpublished data).

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