

Voanioala, the Forest Coconut

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By now, many members of the Society may be aware of the existence in Madagascar of a palm nicknamed “the Forest Coconut.” It was Mardy Darian who first brought the possible existence of this palm to my notice, but it was not until October 1986 that good scientific specimens were collected in the northeast of the island. The Forest Coconut has several unusual features that make it necessary to include it in a new genus. The name *Voanioala gerardii* has been validly published for the Forest Coconut (Dransfield 1989a). At first sight the generic name may be horrifyingly unpronounceable; however, it now trips euphoniously off my tongue! Pronounce it “voh-ann-ee-oh-al-a,” but run the first two syllables together to give, almost, “vuan,” and the “ee” and the “oh” should be run together too. This will then approximate to the Malagasy pronunciation! It is based on the Malagasy name for the palm, and means, literally, “Forest Coconut.” In using a Malagasy name as a generic name, I followed a long established precedent—the names *Vonitra* and *Raphia* are based on Malagasy plant names while *Antongilia*, *Masoala* and *Marojejya* are based on Malagasy place names. The palm has proved to be of exceptional interest on many fronts. It is indeed a relative of the coconut and represents the first member of the subtribe to which the coconut belongs (Butiinae) to be recorded for Madagascar, though not the first cocoid palm (the others are the African Oil Palm, *Elaeis guineensis*, and the endemic *Beccariophoenix madagascariensis*). It is a big tree palm with massive leaf bases and big pinnate leaves. The inflorescence appears very

much like that of the coconut but the male flowers have 12 stamens. Pollen is unlike that of other members of the Butiinae (Harley 1989). The fruit is 7–8 × 4–5 cm and appears superficially like a fruit of an *Attalea*. Inside the fruit there is a very thick endocarp that has irregular bumps on the inside that penetrate the seed, rather like a walnut. Seedlings grown at Kew caused great excitement as, from their root-tips it was discovered by my colleague Margaret Johnson, that the Forest Coconut has a very high number of chromosomes—at least 596 (Johnson 1989). In fact, the mass of chromosomes within the cell nucleus looks, under the microscope, almost like scrambled egg rather than the usual small ribbons. What the significance is of this astonishingly high chromosome number, the highest recorded for any monocotyledonous plant, no one really knows.

A popular account of the collecting of the first scientific specimens of *Voanioala* (Dransfield 1989b) is given in “Plant hunting for Kew,” a book that describes the plant hunting activities of the Royal Botanic Gardens Kew. Since that first expedition I have returned with David Cooke of the Palm House at Kew to the original locality to look at the other palms that we had been unable to study for lack of time on the first trip. It seems certain that this palm is of very limited distribution, occurring as scattered trees in the rain forest. Villagers elsewhere in Madagascar have obliged by reporting the presence of other trees of “voanioala” but these have always turned out to be individuals of tall tree palms such as *Neodypsis lastelliana*. In

1989 in the National Park of Marojejy, I was told of the existence of five different types of "voanioala"; sadly not one of these was the true *Voanioala*, further emphasizing the restricted distribution of the true Forest Coconut.

News travels fast. Within a year of the collecting of the first scientific specimen, the villagers in one part of northeast Madagascar where several palm enthusiasts have visited, were well aware of the Forest Coconut and were busy collecting seed to sell to anyone who wanted to buy. Several private collectors may now already have seedlings of this remarkable palm.

A detailed scientific description of the genus *Voanioala* is provided here, set out in the format of the descriptions in *Genera Palmarum* (Uhl and Dransfield 1987) so that you may make a copy of the description and plate (Fig. 1) and include it as genus 177A, after *Parajubaea*.

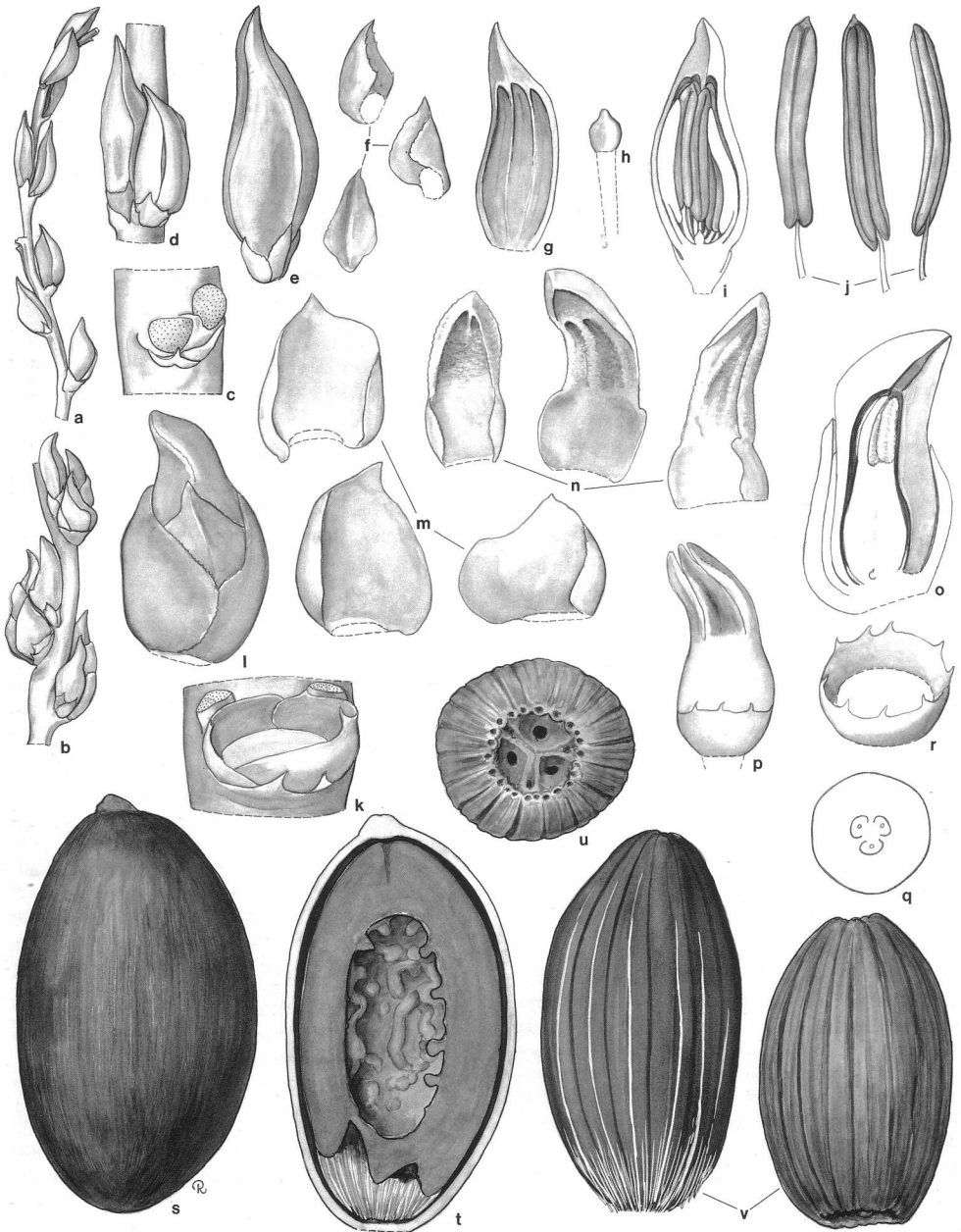
177A. **VOANIOALA** J. Dransfield, Kew Bulletin 44(2):192. Type: **V. gerardii** J. Dransfield.

Robust solitary, unarmed, pleoanthic monoecious tree palm. Stem erect, basally with a large root boss, distally the stem bare, very conspicuously "stepped" and ringed with oblique leaf scars. Leaves pinnate, reduplicate, cleanly abscising; sheath tubular at first, fibrous, apparently soon disintegrating to leave a massive elongate rectangular leaf base, forming an apparent petiole with sparsely fibrous margins, abaxially densely covered with caducous brown indumentum; leaf base suddenly contracting into rachis, true petiole absent, the rachis more or less rectangular in cross section in the mid leaf region, abaxially densely covered with caducous brown indumentum as the leaf base; leaflets numerous, rather stiff, scarcely pendulous, very coriaceous, concolorous, unevenly bilobed at the tips. Inflorescences solitary, interfoliar, apparently protandrous, branching to one order, erect in bud, later horizontal; prophyll tubular, 2-keeled, fibrous, remaining hidden among the leaf bases; peduncular bract bright green and strictly tubular in bud, later splitting longitudinally, flattening and becoming somewhat cowl-like, abaxially deeply and closely longitudinally grooved, bearing scattered brown scales on the ridges between the grooves, adaxially smooth, glabrous, pale cream-colored; peduncle circular in cross section; rachis bearing spirally arranged

rachillae, each subtended by a small triangular rachis bract; rachillae numerous, most with a basal bare portion, the rachillae bearing 0-7 triads near the base and paired or solitary staminate flowers distally, the flower groups spirally arranged, or becoming somewhat distichous by close-packing. Staminate flowers asymmetrical, broadly or narrowly triangular in outline, sepals 3, distinct, slightly to strongly imbricate at the base, triangular, acute to acuminate, membranous, glabrous; petals 3, distinct, unequal, valvate, glabrous, thinly coriaceous except at the thick angular tips, broadly and irregularly triangular-ovate, with acute or acuminate tips, abaxially smooth, adaxially marked with the impressions of the stamens and papillose near the thick tips; stamens 12(-13), filaments subulate, very short to moderate in length, anthers basifixed, basally sagittate, apiculate at the tips, latrorse; pollen circular or elliptic in polar view, monosulcate, intectate with microbaculae, granules and pilae (see Harley 1989). Pistillate flowers only known as buds, much larger than the staminate, irregularly triangular; sepals 3, distinct, unequal, strongly imbricate, broadly ovate, with triangular, keeled tips, coriaceous, glabrous, the margins minutely toothed; petals 3, distinct, longer than the sepals, basally irregularly imbricate, conspicuously valvate at the triangular tips, abaxially with scaly indumentum towards the apex, adaxially strongly papillose towards the tip; staminal ring high with 9 irregular, triangular teeth, 0.1-0.5 mm; gynoecium syncarpous, tricarpellate, triovulate, stigmas 3, angled, papillose and scaly, ovules with axile placentation. Immature fruit green covered with dense chestnut brown scaly indumentum. Mature fruit one-seeded, somewhat irregularly ellipsoid, tipped with a short beak and stigmatic remains; epicarp red-brown, densely covered with brown scaly indumentum; mesocarp with an outer fibrous zone just below the epicarp, and an inner fleshy zone; endocarp ellipsoid, apically pointed, basally truncate, very heavily thickened, pale brown when fresh, becoming grey with age, very deeply and irregularly longitudinally grooved, with 3 very deep basal impressions each with a central germination pore, in section the body of the endocarp traversed by longitudinal irregular vertical canals and fibers, inner surface of the endocarp with numerous irregular rounded excrescences intruding into the cavity. Seed irregularly ellipsoid, filling the endocarp cavity, laterally attached with a narrow irregular hilum, endosperm homogeneous but irregularly intruded by the endocarp protruberances, very hard, white, with a narrow, irregular central lacuna; embryo basal, top-shaped, positioned opposite an endocarp pore. Germination remote-tubular; eophyll entire, lanceolate. $2n = 596+$ (*V. gerardii*, Johnson 1989).

Anatomy.—Not studied.

Distribution.—A single species in northeastern Madagascar.



1. *Voanioala*. **a**, portion of rachilla with staminate flowers $\times \frac{2}{3}$; **b**, rachilla with triads $\times \frac{2}{3}$; **c**, pair of staminate flowers removed to show bracteoles $\times 5\frac{1}{2}$; **d**, pair of staminate flowers $\times 1\frac{1}{2}$; **e**, staminate flower $\times 2$; **f**, staminate sepals $\times 3\frac{1}{3}$; **g**, staminate petals $\times 2$; **h**, pistillode $\times 5\frac{1}{2}$; **i**, staminate flower in vertical section $\times 2$; **j**, stamens $\times 3\frac{1}{3}$; **k**, triads of flowers removed to show bracteoles $\times 2\frac{2}{3}$; **l**, pistillate flower $\times 2$; **m**, pistillate sepals $\times 2$; **n**, pistillate petals $\times 2$; **o**, pistillate flower with staminodial ring attached $\times 2$; **p**, gynoecium with staminodial ring attached $\times 2$; **q**, cross-section ovarian part of gynoecium $\times 6$; **r**, staminodial ring $\times 4$; **s**, fruit $\times \frac{2}{3}$; **t**, fruit in vertical section $\times \frac{2}{3}$; **u**, base of endocarp showing pores $\times \frac{2}{3}$; **v**, endocarp in two views $\times \frac{2}{3}$. *Voanioala gerardii*, Dransfield 6389.

Ecology.—*V. gerardii* grows in swampy valley bottoms and on gentle slopes at an elevation of about 400 m in primary rain forest.

Common Names and Uses.—Voanioala (Malagasy) (literally “forest coconut”). The apical bud is said to be edible. In view of the great rarity of the palm, it is perhaps not surprising that no other uses have been recorded.

Notes.—*Voanioala* possesses several unusual features, such as the multistaminate flower, the pollen and the endocarp with deep longitudinal grooves and internally with irregular swellings. The unique high chromosome number is remarkable, the only other high number recorded for the palms being in *Jubaeopsis caffra*, also belonging to the Butiinae.

Taxonomic Account.—Dransfield (1989a).

Acknowledgment

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