

internationally recognized as endangered (Gorman and Siwatibau 1975; Lucas and Synge 1978). Because of the diversity and high endemism of Fiji's palm flora, combined with increasing threats to their habitat, efforts must be taken to both document the occurrence of taxa present as well as develop conservation strategies for their long-term preservation.

***Heterospathe phillipsii* Fuller and Dowe sp. nov.**

Palma usque 12 m alta. Folia pinnis latis laxis semipendulis medio folii 4.5 cm latis. Inflorescentia ramosa in 4 ordines. Flos staminatus 6 stamina ferens. Fructus ellipsoideus usque 13 mm longus, vestigio stigmatis apicale excentrico. Semen vadoso ruminatum. Typus: Fiji, Viti Levu, Veivatu District, Namosi Province, 8 km NW of Navua, Natural Forest Management Pilot Project (NFMPP) Reserve, c. 150–200 m altitude, 14 Nov 1995, *Fuller 299* (holotypus SUVA; isotypi BH, BRI). (Figs. 1–3).

Solitary palm to 12 m tall. Trunk erect, to 18 cm DBH, green to brown in upper portion, becoming grey with age in the lower portion, base expanded; leaf scars closely spaced, raised. Leaves 10–12 in a compact crown, to 5 m long, arching to curved below the horizontal, 48–52 pinnae per side, leaf bases not forming a crownshaft; new leaf usually reddish/bronze; petiole 30–50 cm long, green, concave adaxially, convex abaxially, glabrous; rachis ridged adaxially, convex abaxially in lower portion becoming flat in distal portion, glabrous; pinnae lax to semi-pendulous, in one plane, glossy dark green on adaxial surface, paler green on abaxial surface, widely and evenly spaced along rachis, lanceolate, apex acute, mid-leaf pinnae to 75 cm long, 3.5–4.5 cm wide; midrib prominent adaxially and raised only slightly abaxially; secondary lateral ribs 2–3 on either side of midrib, most prominent on adaxial surface, positioned unequally between midrib and marginal rib; ramenta on abaxial midrib sparse, absent from distal one-fourth of pinnae, basifixed. Inflorescence interfoliar, to 1.8 m long, branched to four orders, axes white-cream, all branches straight, major branches angular in cross section, minor branches terete in cross section, bases of

branches with prominent pulvini; peduncle to 30 cm long, elliptic in cross section, 2.5 cm wide by 1 cm thick at the base, to 1.5 cm wide by 0.8 cm thick below attachment of first branch; prophyll 50–60 cm long, fully encircling peduncle at attachment, dorsiventrally compressed, marginally winged, persistent, outer surface with numerous punctiform scales, inner surface glabrous, disintegrating to fibrous strands; peduncular bract 1, greatly exerted from apex of prophyll, attached ca. 5 cm above attachment of prophyll, to 1.8 m long, tubular, fully enclosing inflorescence in bud, apex dorsiventrally spatulate, splitting longitudinally along adaxial surface prior to dehiscence, caducous, outer surface with numerous punctiform scales, inner surface glabrous; rachillae 15–25 cm long, white-cream, terete in cross-section, slightly flexuous, longitudinally striate, sparse brown scales most dense near triads. Flowers in triads in proximal portion, paired or single staminate flowers in distal portion, spirally arranged, sessile, subtended by liplike bracts. Staminate flower white-cream, slightly asymmetric in bud, sepals imbricate to 1 mm long, petals valvate to 3 mm long, stamens 6, anthers dorsifixed, latrorse, versatile; pistillode to 3 mm long, columnar, tapered toward the apex. Pistillate flower white-cream, symmetrical, to 3 mm long, sepals imbricate, to 1.5 mm long, petals imbricate to 3 mm long, stigma trifid, protruding at anthesis. Fruit ellipsoid, to 13 × 7 mm, stigmatic remains prominent, eccentrically apical; epicarp smooth (drying pebbled), red at maturity, mesocarp thin, fibrous, endocarp thin, crustaceous. Seed ellipsoid, attached laterally, to 7 × 4 mm, hilum elongate, extending the length of the seed, raphe branches anastomosing, surface with shallow grooves, endosperm shallowly ruminant; embryo basal. Eophyll pinnate.

Distribution: FIJI. Known from one locality on Viti Levu, 8 km north of Navua in forest that has been selectively logged. This same palm species was originally reported (in 1976) from a separate disjunct area near Naimasimasi Village, Province of Tailevu, some 60 km NE of the extant population. A tree from this disjunct population is presently growing in the garden of Mr R.H. Phillips (*Zona 642*). The palms in this area could have

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2. *Heterospathe phillipsii*, habit, inland from Navua, Viti Levu. 3. Leaf and inflorescence of *Heterospathe phillipsii*.

been destroyed when the area was clear-felled for planting Mahogany (*Swietenia macrophylla*). A search in 1994 found no trace of the *Heterospathe* palms (R.H. Phillips, personal communication).

Specimens Examined: FIJI. Viti Levu, Veivatu-loa District, Namosi Province, 8 km NW of Navua, Natural Forest Management Pilot Project (NFMPP) Reserve, c. 150–200 m altitude, 3 Mar 1995, *Fuller & Doyle 159* (BH, BRI, SUVA, US); 15 March 1995, *Fuller & Doyle 171, 172* (BRI, CAS, SUVA); 21 Apr 1995, *Fuller 177* (SUVA); 21 Apr 1995, *Fuller 179* (CAS, SUVA); cultivated in garden of R.H. (Dick) Phillips, Mara Road, Samabula, Suva, 28 May 1995, *Zona 642* (FTG, SUVA); 10 km inland from Queens Hwy, 29 May 1995, *Zona 643* (FTG, SUVA).

Etymology: Named for Richard (Dick) H. Phillips, horticulturist and amateur botanist, who has been active for many decades in collecting and growing Fiji palms.

Ethnobotany: Vernacular name: *niu niu*. The

palm heart is edible and the immature seeds are eaten: they are reported to taste like coconut.

Conservation: Proposed as Threatened: The population consists of an estimated 400–500 adult trees in a single population along a 5 km section of logging road. The area has been selectively logged. The land where *Heterospathe phillipsii* occurs is owned by the Nabukebuke Mataqali (clan) from Nakavu village. The Fiji Department of Forestry has leased most of the palm habitat as part of the NFMPP project for 50 years effective 1 January 1991 (315 ha). Selective logging continues in adjacent rain forest tracts. The palm is cultivated in a few private gardens in Suva while seeds have been distributed to botanic gardens and collectors in Hawaii and Australia.

Heterospathe phillipsii occurs as a semi-emergent element in dense evergreen lowland rainforest, on steep well-drained slopes usually above watercourses at elevations of 80–300 m. Soils are deeply weathered clays with a low natural fertility

(de Vletter 1991). Associated vegetation includes the palms *Balaka longirostris* and *Veitchia vitiensis*, with dominant trees in Myristicaceae (16%), Myrtaceae (9%), Sapotaceae (8%), Clusiaceae (8%), Burseraceae (6%), and Thymelaeaceae (6%). Large *Agathis vitiensis* (Araucariaceae) and a few *Degeneria vitiensis* (Degeneriaceae) are present in the surrounding forest.

Within the population, adult palms are evenly scattered. Regeneration is good with both immature trees (1–3 m tall) and seedlings being common. Flowering and fruiting occur throughout the year in an apparently cyclical non-seasonal manner, with most individuals flowering and fruiting concurrently. Pollination may be achieved by small wasps or bees as these have been observed at the flowers. Dispersal appears to be mainly gravity driven, although Masked Shining Parrots (*Prosopeia personata*) have been observed foraging on the palms.

Heterospathe phillipsii is distinguished from other species of *Heterospathe* by the following combination of characters: tall solitary trunk, pinnae broad and lax, inflorescence branched to four orders, staminate flower with six stamens, fruit ellipsoid with prominent, eccentrically apical stigmatic remains, and the endosperm only shallowly ruminate. The species appears most closely related to the *H. woodfordiana* Becc. group from the Solomon Islands, and to *H. uniformis* Dowe from Vanuatu. This assemblage of species includes moderately tall palms with staminate flowers with six stamens and elongate/ellipsoid fruit. The New Guinea *Heterospathe* (ca. 16 spp.) tend to be rather small arborescent or acaulescent/clustering palms with moderately branched inflorescences (1–3 orders) and with most species having more than six stamens, while those from the Philippines (ca. 11 spp.) tend to be rather small clustering palms with six stamens. The occurrence of *Heterospathe* in Fiji significantly, but not unexpectedly, extends the distribution of the genus.

Other outliers occur in the Moluccas, Micronesia, and Vanuatu.

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