

***Ptychosperma macarthurii*: Discovery, Horticulture and Taxonomy**

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Ptychosperma macarthurii is one of the world's most popular ornamental palms, proving adaptable to a broad range of climatic and cultural conditions. Contrary to this apparent adaptability, the species is relatively uncommon in its native habitats in southern New Guinea and northern Australia, and otherwise occupies a narrow ecological niche. There are some noticeable differences between wild growing plants and those now in cultivation under this name, a situation often attributed to hybridization with other *Ptychosperma* species. This paper presents an account of the species' discovery in 1875 during William Macleay's *Chevert* Expedition to New Guinea, subsequent introduction to horticulture by Sir William Macarthur and the Veitch Nurseries, and examines taxonomic history and typification.

Ptychosperma macarthurii is among the most widely grown and popular palm species (McCurrach 1960, Caulfield 1971, Basu 1969, Parham 1972, Bailey & Bailey 1976, Essig 1977, Dransfield 1986, Fosberg et al. 1987, Minter 1991, Lambert 1994, Matthes 1994, Dematté & Castellani 1999, Riffle & Craft 2003, Van der Velde 2003). Although its discovery, introduction to horticulture and taxonomic history are relatively straightforward, though

not without some dispute (see Essig 1977, 1978), there are questions about the comparative morphological variation found in wild growing plants and those grown in a horticultural setting (Essig 1978, Tucker 1984). Hybridization between *P. macarthurii* and other *Ptychosperma* species has been invoked to explain this situation (Essig 1978, Jones 1995). This paper presents an account of the discovery and introduction to horticulture of the species,

examines its taxonomic history and typification, and discusses the differences between wild growing plants and those found in horticulture.

Discovery: The Chevert Expedition of 1875

The late 1800s was a period of expansive scientific activity in Australia. One of the most productive expeditions around the time was that of the *Chevert* Expedition of 1875 (Stanbury 1975). The expedition was funded, organized and lead by the naturalist and scientific benefactor William Macleay (later Sir), and visited localities in northern Queensland, the islands of Torres Strait, and southern New Guinea (Macleay 1877, Fletcher

1893, Bowen & Bowen 2002) (Fig. 1). The expedition took its name from the 300 ton *Chevert*, a barque built for the French Navy in 1862, and which was subsequently purchased by Macleay and refitted as a scientific vessel (Macleay 1875).

The expedition had a complement of 30 men, including a number of well-regarded scientists and two "gardeners," sponsored by Sir William Macarthur, who were to collect plants for him. Macarthur's gardeners included a "Mr Dingwall," as chief gardener, and Thomas Reedy, as assistant gardener, who was also variously initialed as "J," "M" or "P" in documentation. Nothing is known about Dingwall, although his supposed subordinate

1. Route of the *Chevert* Expedition of 1875 showing places named in the text (after Macleay 1875; Holland & Stanbury 1988). Map prepared by Mirjam Alewijnse (ACTFR).



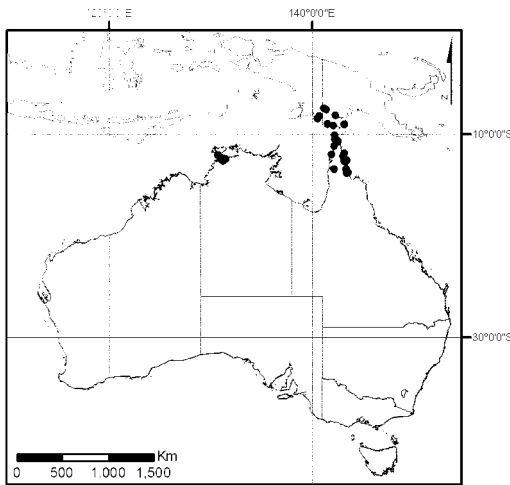
Reedy is recorded as being the collector of the 160 or so herbarium specimens gathered during the *Chevert* Expedition. When his ultimate contribution to the botany of the expedition is considered, Reedy remains somewhat of a mystery apart from a few personal details in the public records of the district of Camden, New South Wales

(Atkinson 1988). In the various accounts of the *Chevert* Expedition, there was occasional mention of "Macarthur's gardeners," including reference to the 100 or so live potted plants that they maintained below decks (Fox 2004). The pots were supported by beams to prevent them falling over in the rough swells encountered in the Torres Strait (Macmillan

2. Illustration (woodcut) of *Kentia macarthuri* in James Veitch & Sons' Catalogue of Plants Including Novelties for 1879.



KENTIA MACARTHURI.



3. Distribution of *Ptychosperma macarthurii* based on herbarium collections. Map prepared by Mirjam Alewijnse (ACTFR).

1957). After the return of the expedition, Macarthur forwarded the herbarium specimens collected by Reedy to the botanist Ferdinand Mueller in Melbourne for identification (Mueller 1875). Presently at least 40 Reedy specimens are accounted for in the National Herbarium of Victoria [MEL] (C. Gallagher pers. comm.), and a small number in the Natural History Museum, London [BM] (V. Papworth pers. comm.). Mueller (1875, 1876, 1877) cited 44 Reedy collections in his accounts of Papuan plants, including one as the type for *Eucalyptus papuana* F. Muell. A Reedy specimen was cited in the description of *Pachygone pubescens* (F. Muell.) Benth. by Diels (1910) in his treatment of the Menispermaceae. Mueller developed a number of biogeographical themes based on Reedy's collections (Frodin 1990), and subsequently named *Elaeocarpus reedyi* F. Muell. (albeit an illegitimate name) to commemorate Reedy's contribution (Mueller 1888, 1890).

The *Chevert* Expedition was able to make only limited land contact in New Guinea because of unfavorable weather conditions,

unsatisfactory relations with the native inhabitants and illness among the crew. The places where the expedition landed included the Katau River (known as Binaturi River on modern maps) and coastal areas adjacent to its mouth; Yule Island; the coast opposite Yule Island; and nearby Ethel River. Of the five month expedition, only 23 days (3–14 July and 18 Aug.–1 Sept.) were spent on New Guinea soil. Otherwise, most of the expedition was spent collecting on islands in Torres Strait, provisioning at Somerset on Cape York Peninsula and repairing the *Chevert* on Darnley Island (Holland & Stanbury 1988).

With regards to collections of palms made by Reedy during the expedition, only three specimens have been located, all in MEL (Table 1). Mueller (1875, p. 13) indicated that at least one palm specimen was seen by him, which he identified as a *Licuala* sp., but it was “not in a state to determine ... precise specific position” and appears not to have survived. There is no indication that Mueller received or studied other palm specimens from the expedition.

Horticulture and nomenclature: Sir William Macarthur's legacy and beyond

Ptychosperma macarthurii was named for Sir William Macarthur (1800–1882), who was one of the most active and influential horticulturists in Australia in the mid to late 1800s. Macarthur was renowned as having the best private collection of plants in New South Wales and was an avid collector and promoter of rare plants (Bligh 1980, Fox 2004). Among the first viticulturists in Australia, Macarthur was a medal-winning wine-maker, as well as a respected amateur botanist and noted plant breeder (Hall 1978). He was appointed as the New South Wales representative at the Paris Exhibition of 1855 and was awarded the Legion of Honor for his services (Maiden 1908). Through his interest in horticulture, Macarthur had established regular correspondence and developed a successful working relationship in both acquiring from,

Table 1. Palm specimens collected by Reedy during the *Chevert* Expedition of 1875 to Torres Strait and southern New Guinea, with collector's number and the National Herbarium of Victoria Herbarium (MEL) accession number.

<i>Ptychosperma macarthurii</i> , Reedy 36 (MEL 2067108)
<i>Arenga microcarpa</i> , Reedy 48 (MEL 2067107)
<i>Caryota rumphiana</i> , Reedy 143 (MEL 2067113)
<i>Licuala</i> sp., not extant (cited by Mueller 1875)



4. *Ptychosperma macarthurii* at Lockerbie Scrub, Cape York Peninsula, Australia, in seasonally inundated swamp forest.

and supplying plants and seeds to the influential Veitch Nurseries in London (Macarthur 1855–1886, Shephard 2003, Fox 2004). Materials collected by Reedy during the *Chevert* Expedition were forwarded to the Veitch Nurseries following the return of the expedition, partly in an effort by Macarthur to recoup the costs of sponsoring his gardeners on the *Chevert* Expedition, and partly to maintain his reciprocal relationship with the Veitches (Fox 2004).

In unpublished correspondence between Harry James Veitch, proprietor of the Veitch Nursery at Chelsea, London, and Macarthur (Macarthur 1855–1886), dated 22 December 1876, the arrival of the first seedlings of *P. macarthurii* was noted: “*The Palms in Case No 1 are as yellow & dried in foliage as if they had been in an oven & been dried. I can only imagine they must have passed through some exceedingly sunny hot weather.*” In an accompanying summary, titled “Report of Cases of Plants from Sir William

5. *Ptychosperma macarthurii*, Pajinka, Cape York Peninsula, in monsoonally influenced littoral forest.



Macarthur received Dec 22 1876," it was recorded that, "Case No 1. Seedling Palm from Katou River about one half dead." Despite this, a number survived and in a letter dated 12 January 1877, the following was noted: "Of the Palms from Katou, New Guinea, of which you sent off 750, we shall not save 40, if so many. I mentioned in my last that these plants appeared to be as dried in foliage as if they had been in an oven & when we came to examine them we found that both these & the Caryotas in Case 2 had dried at the base of the growth, the hearts being quite decayed and dead in nearly all. It is all the greater misfortune for us that we cannot of course propagate from any plants which may survive so that our stock in any case is too limited to do

much with. We sent the seeds on to Mr Wendland at Hannover, our best authority on Palms and we asked him, if new, to associate your name with this plant which he has done, naming it *Ptychosperma* (not *Kentia*) *Macarthurii*. You will thus see our continued desire to identify your name as far as possible with what we may receive from you."

Although Harry Veitch appears to have intended to name it originally as a species of *Ptychosperma*, it became known as a *Kentia* in the horticultural trade. Subsequently, plants labeled "*Kentia Mac Arthuri*; Nouvelle-Caledonie" [the place of origin presumably is a mistranslation of New Guinea] were displayed at the Liège Exposition of 1877 in



6. *Ptychosperma macarthurii*, cultivated plant in Queens Gardens, Townsville, Queensland, Australia.

Belgium as “new or rare plants” from the Jacob-Makoy collection (anon. 1877). Soon after, Harry Veitch presented for sale plants of *Kentia macarthurii* in the James Veitch & Sons’ *Catalogue of Plants including Novelties for 1879* (Veitch 1879). In this, there was a brief description and an illustration of a juvenile plant (Fig. 2) and reference to the supply of the plants from William Macarthur. It can be assumed that the Veitch Nursery had grown and sold plants labeled with the tag name *Kentia macarthurii* from those materials supplied by Macarthur and that plants had been provided to horticulturists and collectors in Europe using that name. It is of interest to note that the price quoted in the Veitch’s *Catalogue of Plants* was 10 s. 6d. to 63s., which, based on currency valuation calculations by

Lawrence and Williamson (2005) convert those prices to present-day values of US\$80.00 to US\$450.00 respectively, thus making the palm a relatively expensive item at that time.

As a taxonomic and nomenclatural technicality, Harry Veitch’s description in the *Catalogue of Plants*, though unable to positively characterize the species, otherwise serves as the protologue and therefore is the accepted place of formal publication of the name of the species (Essig 1978). Authorship of the name *Kentia macarthurii* as H. Wendl. ex H.J.Veitch indicates that Hermann Wendland had suggested the name, but that Harry Veitch had indeed written and published the description. A few years later, the combination *Ptychosperma macarthurii* (H.Wendl. ex H.J.Veitch) H.Wendl. ex Hook. f. was published by Hooker

(1884), who listed palms being grown in the Royal Gardens at Kew in 1882. The co-authorship of Hermann Wendland again indicates that the German botanist had suggested the new combination, as acknowledged by Hooker (1884, p. 10), and that Hooker had actually published it.

In a summary of plants introduced by the Veitch Nurseries, Veitch (1906, p. 283) indicated that *P. macarthurii* was one of that nursery's prime "Stove and Greenhouse Plant" introductions and provided a brief description.

In a paper examining cultivated palms in Bogor Gardens, Wigman (1909), then Assistant Curator of the Buitenzorg (Bogor) Botanic Gardens, provided the combination *Actinophloeus macarthurii* Becc. ex Wigman, based on a suggestion from Beccari, but did not elaborate on a description of the species. Subsequently, *Actinophloeus* was synonymized under *Ptychosperma* (Martelli 1935), with *P. macarthurii* being reinstated, the name which it retains at the present (Govaerts & Dransfield 2005).

Early taxonomic works that dealt with *P. macarthurii* indicated distribution to be in New Guinea (Wigman 1909, Radermacher 1926, McCurrach 1960, Moore 1963) but without mention of any distribution in Australia. The first synoptic work examining *Ptychosperma* in Australia (White 1935) did not mention *P. macarthurii* but otherwise recognized two species, *P. elegans* and *P. capitis-yorkii*, and designated a number of synonyms under these names. *Ptychosperma capitis-yorkii* and all the synonyms included in that work are now considered to be synonyms of *P. elegans* (Essig 1978). The recognition that *P. macarthurii* had distribution in Australia, as well as southern New Guinea, was first positively indicated by Essig (1978) in his revision of *Ptychosperma*. Thereafter, distribution in Australia has been noted by many researchers (Covacevich & Covacevich 1978, Hynes & Tracey 1980, Tucker 1980, 1984, 1988, Lavarack & Godwin 1987), and including populations in both Queensland and the Northern Territory (formerly known there as *P. bleeseri*), its distribution in Australia is well documented.

Does *Ptychosperma macarthurii* have an identity crisis?

Palms identified as *Ptychosperma macarthurii* are among the most commonly cultivated in tropical areas of the world. Some reports

purport that most plants in cultivation under this name are indeed hybrids between the wild progenitors of *P. macarthurii* and other *Ptychosperma* species (Essig 1977, 1978, Hay 1984, Shapcott 1998). However this situation has not been investigated to any satisfactory degree, and it may well be that the phenotypic variation seen in cultivated plants may be the response to cultural conditions, or possibly an expression of the degree of variation that occurs naturally in wild populations (Tucker 1984). Nevertheless, in areas of southern New Guinea and northern Australia (Fig. 3) there exist populations of what may well be referred to as the "wild provenance" *P. macarthurii* as opposed to the "horticultural provenance." Wild populations are characterized by smallish, thin-stemmed plants with leaves with irregularly disposed or grouped leaflets (Figs 4 and 5), whilst most horticultural forms are robust with thicker stems and have leaves most frequently with regularly arranged leaflets (Fig. 6). There is evidence indicating that the "horticultural provenance forms" are prone to be invasive, with feral populations reported in Australia, Singapore, Fiji, Hawaii and Panama (Dowe 1995, Turner et al. 1996, Fuller 1997, Doyle & Fuller 1998, Staples et al. 2000, Svenning 2002).

The genetic variation between the recognizable phenotypes of *P. macarthurii* has not been examined. However, Shapcott (1998) examined isozyme variation between *P. bleeseri* (now considered a synonym of *P. macarthurii* [Dixon et al. 2003]) in the Northern Territory and *P. macarthurii* and *P. elegans* in Queensland. Lack of variation within the otherwise geographically isolated populations near Darwin (i.e., the population formerly identified as *P. bleeseri*) suggested that the populations there were derived from a common ancestor, possibly from a single founder population. The variation compared to populations of *P. macarthurii* and *P. elegans* in Queensland was otherwise significant. However, the variation within *P. elegans* was significantly greater than the variation within the Queensland populations of *P. macarthurii*, probably the result of the collections of the former covering a wide geographical distribution and the latter from a more restricted location (Shapcott 1998). Shapcott did not examine any of the so-called "horticultural provenance forms" of *P. macarthurii*, but only wild plants.

The identity of *P. macarthurii* was open to misinterpretation from its first description, which was of a juvenile plant in cultivation



7. The specimen of *Ptychosperma macarthurii* collected by Thomas Reedy from New Guinea, National Herbarium of Victoria (MEL).

(Fig. 2). The lack of an acceptable description was recognized by Wigman (1909), but it was not until Radermacher's (1926) description that the species was brought somewhat to a better understanding. However, Radermacher's description, with assistance by H.J. Lam (Assistant at the Buitenzorg [Bogor] herbarium), was based on cultivated specimens

in Bogor Gardens, as well as additional specimens of otherwise dubious provenance and identity. Essig (1978), in realizing that the species had an "identity crisis," provided a detailed description based primarily on wild-collected specimens from New Guinea and Australia. In this process, Essig also realized that the name of the species had not been

adequately typified, and thus, in the absence of a holotype, designated a neotype (*Brass* 6376, collected from Daru Island in 1936) based on a wild collection obtained near to where Reedy had first collected the species on the *Chevert* Expedition in 1875. However, with the recent discovery of a Reedy specimen of *P. macarthurii* (as part of the research in preparing this paper) (Fig. 7), the typification of *P. macarthurii* was brought into question. Although the Reedy specimen cannot be implicated in typification, as it was not seen by the original authors and otherwise not cited as part of the protologue, the illustration that accompanied the protologue has priority as a typifying entity in that it was referred to in the protologue and is indeed related to the specimen (albeit a living potted plant) upon which the name was established. With invocation of the rules of priority in assigning types, in accordance with various items in Article 9 (i.e. 9.2, 9.9. and 9.10) in the ICBN (Greuter et al. 2000), the neotype proposed by Essig (1978) should be rescinded and the illustration accompanying the protologue be designated as the lectotype. The revised and updated taxonomy of *P. macarthurii* is as follows:

Ptychosperma macarthurii (H.Wendl. ex H.J.Veitch) H.Wendl. ex Hook.f., Kew Report 1882: 55. 1884; *Kentia macarthurii* H.Wendl. ex H.J.Veitch, Cat. Pl. 1879: 26. 1879; *Saguaster macarthurii* (H.Wendl. ex H.J.Veitch) Kuntze, Revis Gen. Pl. 2: 735. 1891; *Actinophloeus macarthurii* (H.Wendl. ex H.J.Veitch) Becc. ex Wigman, Bull. Dép. Agric. Indes Néerl. 31: 12. 1909. Type: lectotype here designated. Figure of *Kentia macarthurii*, p. 15, James Veitch & Sons' Cat. Pl. 1879. 1879. [rescinds neotype designated by Essig (1978)].

Ptychosperma bleeseri Burret, Repert. Sp. Nov. Regni Veg. 24: 266. 1928; *Actinophloeus bleeseri* (Burret) Burret, Repert. Sp. Nov. Regni Veg. 24: 266. 1928. nom. illeg.; *Carpentaria bleeseri* (Burret) Burret, Repert. Sp. Nov. Regni Veg. 24: 268. 1928. nom. illeg. Type: Australia. Northern Territory. Bankers Jungle, 27 Aug. 1925, A.K.Bleeser 430 (holotype B, destroyed).

Actinophloeus hospitus Burret, Notizbl. Bot. Gart. Berlin-Dahlem 11: 206. 1931; *Ptychosperma hospitum* (Burret) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 12: 596. 1935; *Actinophloeus macarthurii* var. *hospitus* L.H. Bailey. Fairchild Tropical Garden Occasional Paper 7: 4. 1940. Type: Culti-

vation. Indonesia. Bogor Botanic Gardens, 1929?, V-H.17 (holotype B, destroyed).

Ptychosperma julianetti Becc., Atti Soc. Tosc. Sci. Pisa Mem. 44: 143. 1934. Type: Australia. Queensland. Torres Strait, Hammond Is. [Keriri Island], Mar. 1891, A. *Guilianetti s.n.* (holotype FI).

[*Kentia Mac Arthuri* Hort., Belgique Hort. 27: 241. 1877. nom. nud.]

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