

*Principes*, 29(2), 1985, pp. 56-63

## Oraniopsis appendiculata, a Previously Misunderstood Queensland Palm

JOHN DRANSFIELD, A. K. IRVINE, AND NATALIE W. UHL

*Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, UK;*  
*CSIRO, Division of Forest Research, P.O. Box 273, Atherton, Queensland 4883, Australia;*  
*L. H. Bailey Hortorium, 467 Mann Library Building, Cornell University, Ithaca, NY 14853, U.S.A.*

### ABSTRACT

*Orania appendiculata* is shown to be misplaced in *Orania* and to belong to a new genus, *Oraniopsis*, belonging to the tribe Ceroyxleae (subfamily Pseudophoenicoideae) rather than to the tribe Areceae (subfamily Arecoideae). The discovery provides an extraordinary trans-Pacific or trans-Indian Ocean link to the distribution pattern of the Ceroyxleae.

Frederick Manson Bailey, Colonial Botanist to the Government of Queensland, based his new species, *Areca appendiculata*, on a palm collected on the Bellenden-Ker Range, Queensland, during the Government Scientific Expedition in 1889. The palm is referred to, but without name, several times in the official report, and in A. Meston's delightful popular account first published in the "Courier" (the Brisbane newspaper). On Thursday 20th June 1889, at "about 4 o'clock we arrived at 4,000 feet, and camped under a splendid palm tree about 20 feet high, shading a circle 30 feet in diameter. This palm Mr. Bailey may find to be a new species" (Meston 1889). "The point we stopped at is known as the 'Palm Camp,' from a superb palm, beneath the spreading top of which we made our fire and slept."

The palm was duly described as *Areca appendiculata* in 1891. In the protologue, several features stand out as being discordant in *Areca*, especially the position of the inflorescence (Fig. 1B,C), the flowers and the three or four peduncular bracts (Fig. 2B). Bailey added "In many respects this plant resembles *Hydriastele wendlandiana*. I have, however, thought

it advisable to keep it under *Areca* for the present, hoping to receive better specimens, those I collected being much damaged by wet." In 1909, Bailey published the illegitimate name *Orania beccarii* clearly citing *Areca appendiculata* as synonym, and commenting "Dr. O. Beccari, the greatest living authority on palms, writes me that this is a distinct species of *Orania*, hence this change of genus. The specific name is changed because it might no longer be found applicable, in which case I hope botanists will allow me this privilege. The first description stands." Domin (1915) transferred the correct specific epithet to *Orania*. In Bailey's 1909 account, *Orania* is correctly described as having two bracts in the inflorescence; the one or two extra bracts of *A. appendiculata* were thus bibliographically lost. The palm is also mentioned by Miss Gibbs in her account of the phytogeography of the Bellenden-Ker (Gibbs 1917).

*Orania appendiculata* is peculiar in possessing congenitally open flowers, and it was this character, unique to *O. appendiculata* in the genus, and of rare occurrence elsewhere in the palms, which prompted Beccari to suggest in manuscript that *O. appendiculata* should be accommodated in a new subgenus *Oraniopsis*. Beccari's manuscript name was eventually published (Beccari and Pichi-Sermolli 1955) with the commentary that subgenus *Oraniopsis* is quite aberrant, and has some analogies with *Louvelia* in Madagascar by virtue of the congenitally open

flowers, and with *Juania* of Juan Fernandez. Beccari further commented that when the fruit is known, it might be convenient to consider *Oraniopsis* as a distinct genus. However, Essig in his recent synopsis of *Orania* (Essig 1980) made no mention of the generic discordance of *O. appendiculata*, or even of the subgenus *Oraniopsis*.

Good fruiting material collected by H. E. Moore and preserved in the Bailey Hortorium prompted J. Dransfield and N. W. Uhl to look again at the generic affinities of this well-known but little understood Queensland palm and we were immediately struck by the similarities to *Ceroxylon* rather than to Arecoïd palms. A. K. Irvine in the meantime had independently realized that many features of *O. appendiculata* are quite anomalous; the present paper is a result of collaborating since December 1982. During 1983 and early 1984 A. K. Irvine collected complete material, including staminate and pistillate inflorescences and ripe fruit, allowing us to confirm affinity with *Ceroxylon* rather than *Orania*. In fact we believe *O. appendiculata* to represent a new genus, closely related to *Ceroxylon* and adding an extraordinary trans-Pacific or trans-Indian Ocean link to the distribution pattern of the tribe Ceroxyleae (subfamily Pseudophoenicoideae). We have chosen to use Beccari's subgeneric name *Oraniopsis* for the new genus, although we must emphasize that there is no relationship between the new genus and *Orania*, except that caused by misunderstanding.

**Oraniopsis** (Beccari) J. Dransfield, A. K. Irvine & N. Uhl **gen. nov.** (Figs. 1, 2)

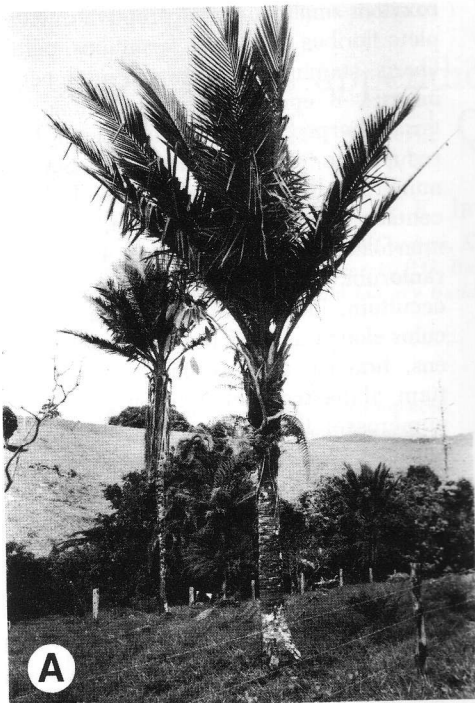
*Orania* Zippelius subgenus *Oraniopsis* Beccari in Beccari & Pichi-Sermolli, Webbia 11: 172. 1955.

Genus novum Australiense ad tribum Ceroxylearum pertinens et ut videtur Ce-

roxyloni similimum sed prophylo incompleto floribus bracteolas ferentibus, petalis liberis, staminibus egregiis, 3 inter petala insertis, 3 epipetalis differt. Palma solitaria, inermis, pleonantha, dioeca. Folio reduplicate pinnata, foliolis discoloribus, numerosis, regulariter dispositis. Inflorescentiae unisexuales, solitariae, axillares, interfoliaceae, foliis breviores, 4-ordinibus ramorum; prophyllum vaginis foliorum occultum, incomplete tubulosum; pedunculus elongatus, 3-5 bracteas magnas ferens, bracteis 2-3 distalibus inflorescentiam alabastro includentibus; rachillae numerosae; flores solitarii, spiraliter dispositi vel subdistichi, unusquisque bracteolam ferens. Flos staminatus calyce cupulari, petalis 3 carnosus, staminibus 6 et pistillodio parvo vel magno. Flos pistillatus staminato similis sed antheris vacuis et ovario magno trilobato. Fructus rotundatus, vestigio stigmati basi, endospermio homogoneo, embryo subbasali.

Species unica: **Oraniopsis appendiculata** (F. M. Bailey) J. Dransfield, A. K. Irvine & N. W. Uhl (*Areca appendiculata* F. M. Bailey).

Medium, solitary, unarmed, pleonanthic, dioecious palm. Stem erect, sometimes quite tall, becoming bare, leaf scars apparently not very conspicuous. Leaves numerous, reduplicate pinnate,  $\pm$  upward-pointing, marcescent, several dead leaves hanging vertically for some time, forming a skirt below the crown before falling completely (Fig. 1B); sheath apparently tubular at first, soon splitting opposite the petiole, the leaf base then open; petiole short, adaxially channeled,  $\pm$  glabrous, abaxially rounded, densely covered with scales and tomentum, the margins smooth and rather sharp; rachis  $\pm$  stiffly held, adaxially flattened or channeled near the base, abaxially rounded, distally angled adaxially, a minute flange present at the junction between the flattened and angled areas of the rachis, both surfaces of the



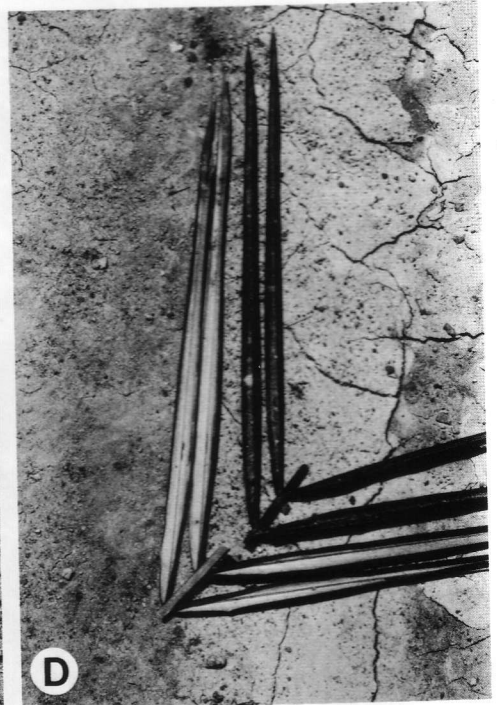
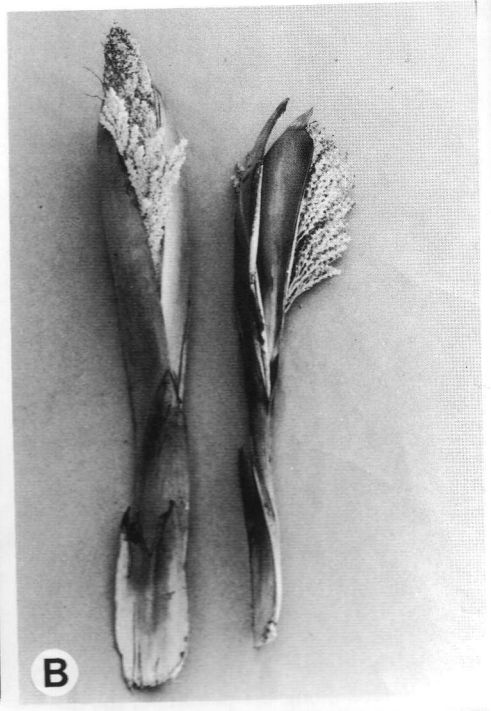
rachis bearing scattered scales; leaflets very numerous, single-fold, regularly arranged,  $\pm$  stiff,  $\pm$  linear, unevenly acute or acuminate, the basalmost few on each side short, narrow and crowded, adaxial surface  $\pm$  glabrous or with scattered scales along the midrib, abaxial surface covered with dotlike scales and a dense felt of indumentum (Fig. 2D); transverse veinlets not evident.

Inflorescences solitary, axillary, interfoliar, shorter than the leaves, staminate and pistillate superficially similar, branching to 4 orders; prophyll short, obscured by the leaf bases, incompletely tubular, 2-keeled,  $\pm$  leathery, becoming fibrous and disintegrating distally, sparsely tomentose, the basal margins decurrent; peduncle elongate  $\pm$  flattened and winged at the base, distally  $\pm$  elliptical in cross-section, sparsely to densely tomentose; peduncular bracts 3-5, elongate, the first inserted near the prophyll, the rest  $\pm$  evenly spaced along the peduncle, the distal 2-3  $\pm$  enclosing the inflorescence in bud,  $\pm$  beaked, leathery, tubular at first, then splitting longitudinally and becoming flattened, sparsely to densely tomentose, eventually caducous, leaving circular or crescentic scars; rachis slightly shorter than the peduncle; rachis bracts numerous, inconspicuous, short, triangular, acute or acuminate, membranous, incomplete, each subtending a first-order branch; first-order branches with a basal bare portion, distally bearing spirally arranged second-order branches each subtended by a minute incomplete bract; rachillae crowded,  $\pm$  twisted or zigzag at anthesis,

(the pistillate spreading but remaining rather zigzag in fruit), bearing rather distant, spirally arranged or subdistichous, minute triangular bracts, each subtending a short stalk bearing a minute, membranous, incomplete, triangular bracteole and terminating in a solitary flower. Staminate flowers symmetrical, or somewhat misshapen from close packing, open from early in development; sepals 3, very small, triangular, membranous, connate basally and forming a cup; petals 3, free, fleshy, much longer than the sepals, narrow, triangular; stamens 6, almost as long as or longer than the petals, the antesepalous inserted between the petals in, apparently, the same whorl (? by displacement), the antepetalous epipetalous, filaments very fleshy with  $\pm$  conical, swollen bases, tapering to the connective, anthers  $\pm$  oblong,  $\pm$  versatile, basally somewhat sagittate, latrorse; pollen elliptic, monosulcate, exine semitectate, the distal face perforate, the proximal face reticulate; pistillode usually very much shorter than the filaments, 3-angled, apically trifid. Pistillate flowers as the staminate but with slightly broader sepals and petals; staminodes as the stamens, the empty anthers large; gynoeceum tricarpellate, triovulate, conspicuously 3-lobed, stigmas apical, short, becoming recurved; ovules laterally attached, ? hemianatropous. Mature fruit developing from 1 carpel, rounded, the stigmatic and carpel remains basal; epicarp smooth, yellow at maturity; mesocarp  $\pm$  fleshy, with horizontal fibers and stone cells; endocarp obsolescent. Seed, rounded, the integuments thick,  $\pm$  woody,

---

1. *Oraniopsis appendiculata*. A. Watson Road Millaa Millaa, Atherton Tablelands, North Queensland. Form of palms left exposed after clearing land for dairy farming, some 60-70 years earlier. The palms are 9 meters tall  $\times$  20 cm stem diameter, and would have at least been taller than the reach of cattle 60-70 years ago and noticeable enough for the farmer to leave standing. B. Kelly Road, Millaa Millaa, North Queensland. Old inflorescences in axils of leaves. C. Watson Road, Millaa Millaa, North Queensland. Exposed palm with full size but  $\frac{3}{4}$  mature, green fruit. Foreground: *Drynaria rigidula*, an epiphytic fern growing on the palm. Background right: *Calamus moti*. D. Topaz, North Queensland. In rain forest gully near edge. Overall height 9 meters. 1-12-1984. Photos by Tony Irvine.





with a basal short spur, and few sparsely branched, impressed vascular strands; endosperm homogeneous with a narrow central hollow; embryo sub-basal. Germination adjacent-ligular; seedling leaf bifid with entire tips.

**Oraniopsis appendiculata** (F. M. Bailey) J. Dransfield, A. K. Irvine & N. W. Uhl, **comb. nov.**

*Areca appendiculata* F. M. Bailey, in Dep. Agric. Bot. Bulletin 4: 18. 1891. Type: Queensland, Bellenden-Ker, F. M. Bailey s.n. in 1889 (BRI).

*Orania appendiculata* (F. M. Bailey) Domin in Bibliothec. Bot. 85: 498. 1915.

*Orania beccarii* F. M. Bailey in Queensland Agric. Journal 23: 35. 1909. Type as for *A. appendiculata*.

Trunk up to 20 m tall, 20–45 cm diam. at breast height, gray, irregularly marked with leaf scars. Leaves ca. 8–15 in crown, up to ca. 6 m long; sheathing base cup-like, rather short ca. 20 cm wide at the base, tapering to ca. 15 cm wide, and then narrowing into the petiole; petiole up to ca. 65 cm long, up to ca. 7.0 × 6.0 cm in section, the margins ± winged, ca. 1–2 cm deep, sharp, abaxially brown tomentose; rachis becoming adaxially ridged at ca. half its length; leaflets up to ca. 110 on each side of the rachis, the apical pair composed of 2–4 folds, the rest all single-fold, basal leaflets ca. 15–20 × 0.5–0.8 cm, mid-leaf leaflets to ca. 100 × 4.5 cm, apical pair up to ca. 43 × 4.5 cm, leaflets held at ca. 60° from the rachis

except near the tip where ca. 30°; adaxial surface dark green, abaxial surface mealy, grey-white, tinged brown, with numerous small, dark brown scales. Inflorescences 80–120 cm long; peduncle up to ca. 75 cm long, up to ca. 4 × 2 cm in cross-section, strongly flattened and winged at the base; prophyll borne near the base of the peduncle, ca. 25 × 6 cm, abaxially open to the base, adaxially splitting irregularly; peduncular bract 1 inserted 6–13.5 cm above the base, up to ca. 60 cm long, split abaxially, opening out somewhat, ca. 10 cm wide at widest point, strongly keeled; peduncular bract 2 inserted ca. 20–26 cm above the base, 60–135 × 8–12 cm; peduncular bract 3 inserted ca. 25–50 cm above the base, slightly smaller than bract 2; peduncular bract 4, where present, inserted up to 70 cm above the base, either similar to bract 3, up to 87 cm long or dissimilar, triangular, membranous, ca. 5 cm long, incompletely sheathing with long decurrent margins; peduncular bract 5, where present, inserted up to 70 cm from the base, membranous, subulate, ca. 6 cm long; rachis ca. 35–45 cm long; rachis bracts triangular, membranous, easily disintegrating, the basal to 4 × 1 cm, the distal very small and inconspicuous; first-order branches ca. 70 in staminate, 30–40 in pistillate inflorescence, spirally arranged; rachillae very numerous, staminate ca. 3–5 × 0.15 cm, pistillate ca. 4–10 × 0.2 cm. Staminate flowers cream-colored, borne on pedicels ca. 1.2 × 1.2 mm; calyx ca. 1 mm high with lobes to 0.5 mm; petals ca. 6 × 2 mm; filaments ca. 3–3.5 mm long, ca. 1

1. *Oraniopsis appendiculata*. A. Watson Road, Millaa Millaa, North Queensland. An exposed staminate palm 7 meters tall, stem diameter 22 cm, on land cleared 60–70 years earlier for dairy farm. Note epiphytes: *Drynaria rigidula* (a fern) and *Schefflera actinophylla* (Araliaceae) Umbrella Tree. Background left: *Calamus moti*. Note the palms would have at least been taller than the reach of cattle 60–70 years ago. B. Keith Davis's farm, Watson Road, Millaa Millaa, North Queensland. Staminate inflorescence left, pistillate inflorescence right. C. Leaf, Topaz, North Queensland. Taken at Timberlea, Atherton (Irvine's home), daughter Rina (nearly 10 years old) and son Ian (4 years old). D. Kelly Road, Millaa Millaa, North Queensland, Australia. Upper and lower leaflet surfaces, greyish white below, green above. 1-12-1984. Photos by Tony Irvine.

mm diam. at the base, anthers ca.  $5 \times 1$  mm; pistillode ca. 1 mm high, sometimes longer. Pistillate flower similar to staminate; pedicel ca.  $2 \times 2$  mm; calyx ca. 1 mm high with lobes to 0.5 mm; petals  $5 \times 2.2$  mm; filaments of staminodes  $1.5 \times 1$  mm, empty anthers ca.  $3 \times 0.8$  mm; ovary strongly 3-lobed, ca.  $2 \times 3.5$  mm, the stigmas ca.  $0.8 \times 0.3$  mm, mature fruit 2.7–3.4–2.3  $\times$  2.4–2.9 cm borne on pedicels  $3 \times 3$ –4 mm; epicarp bright yellow; mesocarp ca. 2.7–3.0 mm thick, the outer ca. 1.7 mm wide layer semiclear, the inner layer white pulpy; seed globose, ca. 2.2 cm diam., the integument black, ca. 0.5 mm thick; endosperm with a small central hollow ca. 2 mm wide.

**SPECIMENS EXAMINED:** AUSTRALIA: North Queensland: Upper Mossman River, 20.9.1936, *H. Flecker 2324* (QRS); Eastern slope of Mt. Bartle Frere, 29.10.1939, *H. Flecker 6405* (QRS); Harvey Creek, 9.11.1947, *H. Flecker 11788* (♀) (QRS); Boonjie Logging Area, State Forest Reserve 1230, Western foothills of Mt. Bartle Frere, 4.4.1972, *A. K. Irvine 179* (♂) and *180* (♀) (QRS); Mt. Lewis, State Forest Reserve 143, 22.8.1972, *A. K. Irvine 310* (♀) and *311* (QRS); Boonjie Logging Area, State Forest Reserve 1230, 23.1.1973, *A. K. Irvine 444* (♀) (QRS); Topaz, 7.2.1983, *A. K. Irvine s.n.* (♀) (BH, BRI, K); Millaa Millaa, Watson Road, 13.3.1984, *A. K. Irvine s.n.* (♀) and (♂) (K); Topaz, 14.3.1975, *G. Unwin 2* (♀) and (♂) (QRS); Mt. Bellenden-Ker, 1914, *L. S. Gibbs 6316* (K);

**Distribution:** *Oraniopsis appendiculata* occurs in rain forests of mountain ranges between the upper Tully River area ( $15^{\circ}40'S$ ), northwards to the Big Tableland ( $17^{\circ}50'S$ ) about 25 km south of Cooktown with the most inland occurrence being on the Great Dividing Range, southwest of Atherton, some 75 km inland, above 1,100 m altitude.

**Ecology:** The species occurs mostly above 300 m up to ca. 1,500 m altitude,

and also in narrow gorges and gullies at the foot of abruptly descending coastal ranges, but does not extend on to the broader coastal plains. Rainfall is mostly above 1,800 mm per annum, with frequent cloud mist compensating rainfall in the 1,800 mm regions. Soil types are mostly of granitic and metamorphic origin; the palm also occurs on shallow basaltic soils with impeded drainage. The palm is usually absent from deep, well-drained basalt soils. It occurs in the following rain forest types (Tracey and Webb 1975): Simple Microphyll Vine Fern Thicket, Simple Notophyll Vine Forest, Upland Mesophyll Vine Forest and Complex Mesophyll Vine Forest.

Seeds begin to germinate after 200–400 days, but some may continue to germinate 3–4 years after sowing. The palm is very slow growing and seems to stay in the rosette stage for at least 20–30 years. In dense rain forest rosettes may even be twice this age with erect leaves 3–8 m long. Unless growth rates accelerate markedly when a trunk is produced, tall stemmed individuals must be several hundred years old.

*Oraniopsis* is very closely related to *Ceroxylon*; indeed the only differences between the two genera are the presence in *Oraniopsis* of a bracteole on the pedicel, the incomplete rather than closed prophyll, the free petals, and the curious position of the antesealous stamens. The differences between the genera of the Ceroxyleae are best displayed in the following key.

### Key to Genera of Ceroxyleae

1. Stigmatic remains basal in fruit ..... 2
1. Stigmatic remains lateral to subapical in fruit ..... 3
2. Petals basally united; stamens 6–15 or more. Andes of S. America ..... *Ceroxylon*
2. Petals free; stamens 6. Queensland ..... *Oraniopsis*
3. Androecium with united filaments. Madagascar ..... *Louvelia*
3. Androecium with free filaments ..... 4
4. Pistillate flower with staminodes bearing rudimentary

mentary anthers; staminate inflorescence often multiple; prophyll incomplete. Madagascar ..... *Ravenea*

4. Pistillate flower with staminodes lacking rudimentary anthers; staminate inflorescence solitary; prophyll complete. Juan Fernandez Is. ... *Juania*

It would seem at first that the discovery of a close relative of *Ceroxylon*, an Andean genus, in Australia suggests a strong trans-Pacific link; the presence of another member of the Ceroxyleae, *Juania*, on Juan Fernandez off the coast of Chile, would seem to emphasize a trans-Pacific distribution pattern of the tribe. However the two other Ceroxyloid genera, *Louvelia* and *Ravenea* are both confined to Madagascar and offshore islands, and the distribution of the Ceroxyleae might better be explained by an origin in Gondwanaland, followed by rafting on land destined to become present day Madagascar, Australia and South America. Whatever the ancient dispersal path, the presence of *Oraniopsis* in Australia is of great phylogeographic interest.

### Acknowledgments

The authors thank Mr. Tony Rodd, Royal Botanic Gardens, Sydney, and Dr.

Robert Johnson, Queensland Herbarium, for their helpful reviews, and Madeline Harley, Royal Botanic Gardens, Kew, for providing a pollen description.

### LITERATURE CITED

- BAILEY, F. M. 1891. Contributions to Queensland Flora. Dep. Agric. Botany Bull. 4(13): 7-39.  
 ———. 1909. Contributions to the flora of Queensland. Queensland Agric. Journ. 23: 35.  
 BECCARI, O. AND R. E. G. PICHI-SERMOLLI. 1955. Subfamiliae Arecoidearum Palmae Gerontogaeae. Tribuum et Generum Conspectus. Webbia 11: 1-187.  
 DOMIN, K. 1915. Beiträge zur Flora und Pflanzengeographie Australiens. Bibliotheca Botanica. 85: 1-551.  
 ESSIG, F. B. 1980. The genus *Orania* Zipp. (Areaceae) in New Guinea. *Lyonia* 1(5): 211-233.  
 GIBBS, L. S. 1917. The phytogeography of Bellenden-Ker. *Journ. Botany* 55: 297-310.  
 MESTON, A. 1889. Bellenden-Ker Range (Wooroonooran), North Queensland. In F. M. Bailey AND A. I. Meston, Report of the Government Scientific Expedition to Bellenden-Ker Range. Department of Agriculture, Queensland.  
 TRACEY, J. G. AND L. J. WEBB. 1975. Key to the Vegetation of the Humid Tropical Region of North Queensland. Vegetation maps at 1:100,000. Topographic Survey R631 Series. CSIRO Melbourne.

## CLASSIFIED

COLOMBIAN PALM SEEDS. May-Dec 85 I will make expeditions through Colombia in search of seeds of *Acrocomia*, *Aiphanes*, *Ammandra*, *Asterogyne*, *Astrocaryum*, *Attalea*, *Bactris*, *Catoblastus*, *Ceroxylon*, *Chamaedorea*, *Chelyocarpus*, *Copernicia*, *Cryosophila*, *Desmoncus*, *Dictyocaryum*, *Elaeis*, *Euterpe*, *Geonoma*, *Hyospathe*, *Iriarteia*, *Iriartella*, *Jessenia*, *Leopoldinia*, *Lepidocaryum*, *Manicaria*, *Mauritia*, *Maximiliana*, *Metasocratea*, *Oenocarpus*, *Orbignya*, *Parajubaea*, *Parascheelea*, *Pholidostachys*, *Phytelephas*, *Prestoea*, *Raphia*, *Reinhardtia*, *Sabal*, *Scheelea*, *Socratea*, *Syagrus*, *Synechanthus*, *Welfia* and *Wettinia*. \$.35 US per seed plus postage. List desired species and quantity (min order 100 seeds per species). Seeds sent as available, on a "first come first served" basis. GABRIEL DARIO BOLIVAR, Transversal 39 No 73 B-56, Medellin, Colombia.