

Discussion:—*Areca bakeri* is similar to *A. jugahpunya* Dransfield (1984: 13) in its acaulescent, clustering habit and broad leaflets, but can immediately be distinguished by the densely clustering habit with ca. 20 stems in the clump, very long and slender petioles, leaflets more papery and the tips of terminal leaflets slightly obliquely lobed. The inflorescence of *A. bakeri* is more similar to *A. dransfieldii* than to *A. jugahpunya*, especially with its swollen-flattened rachillae and only one pistillate flower on each rachilla. However, *A. bakeri* is easily distinguished from *A. dransfieldii* by its acaulescent litter-trapping habit, leaves with very long petioles (100–105 cm) and broad leaflets, and infrafoliar inflorescences borne among marcescent leaf sheaths with somewhat long peduncles. In contrast, *A. dransfieldii* has conspicuous stems with aerial branching, leaves with long petioles (25–81 cm) and numerous finely-regular leaflets, and infrafoliar inflorescences with short peduncles.

***Areca churchii* Heatubun, sp. nov.**

Palma solitaria, caude gracillimo, inflorescentia fortiter effusa, floribus staminatis spiraliter dispositis, sepalis elongatis, staminibus 11–12, filamentis interdum tortilis et circinatis, floribus foemineis semper singulis in rachillis, 1–2 cm longioribus in rachillis basaliter dispositis, differt.

Type:—INDONESIA. Borneo, West Kalimantan Province: Serawai, Sungai Merah, 2 km to W of camp along Gaharu trail towards Sungai Labang, surrounding ridges and valleys, February 1995, *Church et al. 2083* (holotype K!, isotypes BO!, A).

Solitary, slender, undergrowth palmlet. Stem up to 2 m tall, ca. 2 cm diam.; internodes 1–2 cm long. Leaves ca. 8 leaves in crown, pinnate, 95–115 × 65–90 cm long; sheath tubular, not fibrous, up to 20 cm long, striate; crown shaft well defined, 30–40 cm long, 3 cm diam.; petiole up to 65 cm long, channelled adaxially, rounded abaxially, 5–6 mm wide and 6–7 mm thick; rachis with adaxial longitudinal ridge, rounded abaxially; blade with irregularly arranged leaflets, 5–7 leaflets on each side, 3–11 cm spacing between leaflets, leaflets with 2–7 folds, leaflets near petiole ca. 46.5 × 1.5 cm, slightly sigmoid and tip oblique-lobed, middle leaflets 47–51 × 5–5.5 cm, and terminal leaflets about 33 × 7 cm, tips bifid with lobes 0.5–2 cm depth, papery, dark adaxially and pale abaxially when dried. Inflorescence infrafoliar, erect, 20–25 × 14–24 cm at anthesis, protandrous, branching to 1 order; peduncle 2–2.2 cm long, prophyll not seen; rachis pale yellow at the base and peach-coloured towards the apex and light brown when dried; rachis bracts caducous; rachillae 13–17, 12–20 cm long, slender, spreading, covered by minute light brown to chocolate-brown indumentum, elongate, sinuous to slightly zigzag in appearance. Floral clusters spirally arranged on the rachillae, only one complete triad including a female flower occurring near the base of each rachilla. Staminate flowers relatively large, triangular, elongate, 8.5–10 × 2–2.5 mm, asymmetric, sessile; calyx cup-shaped, 1.5–2.3 mm wide and 2 mm high, 3-lobed, the lobes ca. 1.25 × 0.5 mm; petals 3, valvate, elliptic to slightly spatulate, ca. 7.7 mm long and 1.8 mm wide at anthesis, connate at the base, cream-coloured; pistillode lacking; stamens 11–12, 5–6.5 mm long, elongate, basifixed; anthers 2.5–3.5 mm long and 0.3 mm wide after anthesis, cream-coloured; filaments 2–3.5 mm long and 0.2 mm wide, dark brown, sometimes twisted and coiled, free near corolla and connate at the centre. Pistillate flowers larger than the staminate, triangular, 11.8–15 × 6.7–7.1 mm, only one flower on each rachilla, positioned 1–2 cm from the base of rachilla; sepals 3, imbricate, triangular, striate, 7–9 mm long and 6 mm wide at anthesis; petals 3, imbricate, triangular, striate, ca. 10 × 5 mm; gynoecium 13 × 4 mm at anthesis, tubular shaped; stigma trifid, 4 × 4 mm; style 9 mm long, 4 mm wide; staminodes lacking. Fruits very young, dull green and yellow at the base, mature fruits not seen. (Figure 3).

Distribution:—Only known from the type of locality in Sungai Merah, Serawai, West Kalimantan Province of Indonesia.

Habitat:—This species grows on hill slopes above the perennial stream of Sungai Labang in Dipterocarp forest in association with *Shorea*, *Dipterocarpus*, species of *Lauraceae* and *Sapotaceae*.

Local name and uses:—Not recorded.



FIGURE 3. *Areca churchii*. A. Apical portion of leaf. B. Middle and basal portion of leaf. C. Petiole, leaf sheath and crown shaft. D. Inflorescence with pistillate flowers still attached. E. Detail portion of rachilla showing staminate and pistillate flowers in bud. F, G. Staminate flower whole and in section. H, I. Pistillate flower whole and in section. Scale bar: A–C = 6 cm; D = 4 cm; E = 2 cm; F, G = 3 mm; H, I = 5 mm. A–E, H from *Mogea* 3452; F–G from *Dransfield* JD 7531; I from *Heatubun* 901. Drawn by Lucy T. Smith.

Conservation status:—Critically Endangered (CR B2ab). This palm meets the criteria for the threat category “Critically Endangered” (IUCN 2001) because it is known only from one locality in Sungai Merah area in Serawai, Indonesian Province of West Kalimantan, Borneo and its area of occupancy is estimated to be less than 10 km². The area in which this palm grows faces major threats such as forest burning, land clearing for oil palm plantation and resettlement, logging and mining activities, and thus a decline in extent of occurrence, area of occupancy and quality of habitat is inferred.

Etymology:—The specific epithet of this species honours the collector of the type specimen, A. C. Church from Harvard University, USA.

Discussion:—*Areca churchii* is similar to a number of other miniature *Areca* species, namely *A. abdulrahmanii* Dransfield (1980: 33), *A. andersonii* Dransfield (1984: 6), *A. klingkangensis* Dransfield (1984: 13) and *A. mogeana* in its slender-solitary habit and pinnate leaves in general, although there are still some distinctions in leaf segmentation and texture. Primarily, they differ in the inflorescence and flower structure, including number of stamens. *Areca churchii* has an inflorescence with 13–17 long-slender sinuous rachillae, with sessile staminate flowers with 11–12 stamens. *A. abdulrahmanii* has an inflorescence with 3 divaricate-sinuous rachillae and stipitate staminate flowers with 16 stamens. *Areca andersonii* has an inflorescence with 3–4 very slender rachillae, and sessile staminate flowers with 6 stamens. *Areca klingkangensis* has an inflorescence with only 3 rachillae, and stipitate staminate flowers with 9 stamens. *A. mogeana* has an inflorescence with 5–8 slender rachillae, and sessile staminate flowers with 6 stamens.

The divaricate structure of the inflorescence and the sinuous to slightly zigzag rachillae of *A. churchii* are similar to those of *A. abdulrahmanii*, *A. arundinacea* Beccari (1877: 23), *A. furcata* Beccari (1877: 23), *A. minuta* Scheffer (1876: 146), *A. mogeana* and *A. ridleyana* Beccari in Furtado (1933: 236). However, in addition to the important characters of staminate flowers already mentioned above, this new species can be easily distinguished from these by the presence of only one pistillate flower on each rachilla, this positioned 1–2 cm from the base of the rachilla.

The fused, twisted and coiled filaments that are found in this species have never been reported in the genus *Areca* or even in the subtribe *Arecinae*. In the tribe *Areceae* these characters have only been spotted in the monotypic and endemic genus *Tectiphiala* from Mauritius and also perhaps in the genus *Calyptrocalyx* and *Chambeyronia* (Dransfield *et al.* 2008).

***Areca dransfieldii* Heatubun, sp. nov.**

Inflorescentiae structura A. tunku J.Dransf. & C.K.Lim affinis, sed caule caespitoso, inflorescentia cremaea vel viride, floribus staminatis uniseriatim vel distichis, staminibus antheris dorsifixis, floribus foemineis solitariis in rachillis bene distincta.

Type:—MALAYSIA, Borneo, Sarawak: Miri, Lambir National Park, Path from waterfall, 04° 12.209' N 114° 02.151' E, 1 April 2008, *Heatubun & Rebi 901* (holotype K!, isotype SAR!).

Small, slender, undergrowth palmet, clustering (rarely solitary) with aerial branching, sometimes decumbent, stilt roots up to 40 cm. Stem 2–3 m tall, 1–2.5 cm diam.; internodes 1–4 cm long, green near tip and greyish at the base, nodal scars conspicuous, whitish brown. Leaves 5–7 in crown, pinnate, 100–165 cm long (including petiole); sheath tubular, 15–25 cm long, smooth, pale green to mid green; crown shaft well defined, 30–40 cm long and up to 2–2.5 cm diam.; petiole 25–81 cm long, channelled adaxially, rounded abaxially; rachis ascending but not arching, with adaxial longitudinal ridge, rounded abaxially; blade with regularly arranged leaflets, 9–23 leaflets on each side; leaflets somewhat descending, 1–2 main veins running parallel from the base to the tip, leaflets near petiole small, ca. 30 × 0.9 cm, slightly sigmoid, the middle leaflets about 46 × 2.1 cm and the terminal 27–29 × 1.1–1.8 cm, linear, pointed tip except for the terminal slightly oblique-lobed, papery, green adaxially and pale green abaxially. Inflorescence infrafoliar, erect, 10–14 cm long at anthesis, protandrous, branching to 1 order; peduncle 1–2.5 cm long, cream when young and turning green when mature; prophyll green, ca. 13 × 2 cm, elongate-triangular with pointed tip; rachis cream to green; rachis bracts not persistent; rachillae 4–7 and 7–11 cm long, very stiff and stout but not straight, flattened, elongate.