staminatae et pistillatae superficialiter similes, ramis in ordines 2–3 dispositis; bracteae ramorum ordinis primarii conspicue, distichae, imbricatae, reticulatae. Rachillae inflorescentiae staminatae ramosae, ramis aggregatis amenitiformes; rami rachillae bracteas distichas ferentes, unaquaque bractea bracteolam 1 floremque 1 subtendente. Rachillae inflorescentiae pistillatae non ramosae, bracteae tubulosas distichas ferentes, unaquaque bractea bracteolas 2 floremque 1 subtendente. Flos staminatus calyce tubuloso tridentato, corolla breviter tubulosa trilobata praeditus; stamina 6, breviter epipetala; pistillodium minutum. Flos pistillatius calyce tubuloso tridentato, corolla breviter tubulosa trilobata praeditus; staminodia 6, breviter inter se connata et epipetala; gynaecceum squamatum, stigmatibus 3, loculis 3 praeditum, unoquoque loculo ovulo solitario anatropo instructo. Fructus squamatus monospermus; endospermium homogeneum, embryone basali.

**Retispatha demetosa** *J. Dransfield* sp. nov. Palma usque 8 m scandens, caespitosa, dumentum formans. Folium usque 3-75 m longum, foliolis regularibus utrinsecus usque 80. Inflorescentiae usque 1 m longae. Flores staminati minutii. Flores pistillati solitarii, usque 7 mm longi. Fructus obpyriformis, 20 × 18 mm, seriebus verticalibus squamarum 15 tectus. Typus: Borneo, *Dransfield* 4403 (♀; holotypus K; isotypi BO, L).

Massive, clustering, spiny, dioecious palm, clambering, looping and rooting, shortly climbing, rarely more than 8 m tall, forming thickets, sometimes bearing short, bulbil-like shoots on the bare stems; stem without the leaf sheaths to 4 cm diam., sometimes to 7 cm diam., green, with conspicuous nodal scars to 10 cm distant; adventitious roots sometimes present just below the nodal scars; stem with sheaths to 6 cm diam., sometimes extremely robust, to 10 cm diam. Sheaths dull green, densely armed with shining, black, flattened spines, from minute spiculae to 1·5 mm long to robust spines to 6 cm long, the larger spines with conspicuous pale, swollen bases, confluent in oblique partial whorls or groups and mostly reflexed, the smaller spines and spiculae mostly upward-pointing; caducous reddish-brown indumentum abundant between the spines; leaf-sheath mouth at first bearing a conspicuous ocrea to 20 cm long also armed with groups of black spines and splitting to produce two lateral ear-like structures, these quickly tattering and disintegrating till ocrea finally absent. Petiole and rachis to 3·75 m long, the leaf subcirrate; petiole arcuate, c. 60 cm long, deeply channelled adaxially, rounded abaxially, c. 2 cm wide near the base, c. 1·5 cm wide at the insertion of the most proximal leaflets; petiole unarmad adaxially, abaxially armed with lateral grapnel groups of 2–5 reflexed, bulbous-based, black spines to 12 mm long, and much smaller scattered spines, the grapnel groups about 5 cm distant, also bearing similar but scattered spines distally along the mid-line; caducous, grey-brown indumentum abundant on young petioles and rachides; rachis arcuate, tapering along its length, strongly angled and unarmad, adaxially, rounded abaxially and armed with groups of up to 5 reflexed, black spines forming grapnels about 10 cm distant proximally, decreasing to 3 cm distant near the leaf tip; solitary reflexed spines also present scattered near the leaflet bases proximally on the rachis. Leaflets up to c. 80 on each side of the rachis, rather fine, regularly about 4 cm distant, dark green, shiny; lowermost few leaflets
Fig. 1. Retispatha dumetosa. A leaf sheath; B abaxial surface of leaf tip; C adaxial surface of rachis showing details of leaflet insertion; D adaxial surface of portion of petiole. All $\times \frac{1}{4}$, from Dransfield 4632. Drawn by A. Davies.
Fig. 2. Retispatha dumetosa. Details of staminate inflorescence. A inflorescence in bud × ½; B part of inflorescence at anthesis × ½; C detail of second order branch, abaxial surface × 5; D detail of second order branch, adaxial surface × 5; E detail of third order branch, adaxial surface × 5; F staminate flower in bud × 10; G staminate flower at anthesis × 10; H vertical section of staminate flower × 10; J bracteole × 10. A, C, D, E, F, J from Dransfield 4410, B, G, H from Dransfield 4726. Drawn by A. Davies.
to c. 30 × 1·2 cm; leaflets of mid-lamina to about 45 × 2.2 cm; uppermost leaflets to 9 × 0·8 cm, leaflet length decreasing gradually from mid-lamina; longitudinal veins 3–5 conspicuous and veinlets numerous, semi-prominent, transverse; upper leaflet surface unarméd, except along margins where armed with short, solitary or paired and divergent, black bristles to 1 mm long; lower surface with slender black bristles to 3 mm long along mid-vein, and with shorter bristles along the two other most conspicuous veins.

Inflorescences rather inconspicuous. Staminate inflorescence to c. 1 m long; prophyll to c. 50 × 2·5 cm, tubular in the lower half, tattering and distintegrating distally, densely covered in black spines to 3·5 cm long; other peduncular bracts each subtending a primary inflorescence branch (in one specimen, subtending two branches); primary branches to 75 cm long, stiff in bud, slightly pendulous at anthesis, covered in distichous, imbricate, unarméd bracts to 8 cm long (4 cm in another specimen), tubular in the lower two-thirds, with a triangular limb, composed throughout of numerous diagonal criss-cross fibres, when dry appearing as a fine network, dull-brown below, paler towards the tips; axis of primary branch apparently sometimes elongating, the bracts then only partially imbricate; each net-like bract subtending and either completely or partially enclosing a short, condensed, flower-bearing branching system inserted c. 5 mm above the subtending bract, the whole catkin-like system c. 2·5–3 × 0·75 cm; branch axis branching to 1 order further, giving about 6–9 distichously arranged branches on each side, each subtended by a short, membranous, triangular bract, about 3 mm long, with ciliate margins; bracts and branches frequently distorted by close-packing; each ultimate branchlet bearing up to 6 small, membranous, ciliate-margined, triangular bracts c. 1 mm long, each enclosing a prophyllar, cup-like bracteole to 1 mm long, with 2 ciliate keels and ciliate margins; each bracteole enclosing one staminate flower. Staminate flower about 2 × 1 mm, varying considerably in shape due to the effects of close-packing; calyx tubular, striate, to c. 1·5 × 1·2 mm, with 3 triangular lobes tipped with multi-cellular hairs, sinuses rounded; corolla to 2 mm long, tubular in the lower third, with 3 striate lobes to 0·7 mm wide; stamens 6, epipetalous at the mouth of the corolla tube, filaments joined briefly laterally; c. 0·3 mm long; anthers c. 0·5 × 0·2 mm; pistillode trifid, c. 0·4 mm long; pollen already shed in available specimens.

Pistillate inflorescence to c. 1 m long, arcuate, sometimes with 1–2 branches besides the axis, bearing net-like bracts and rachillae; prophyll and other peduncular bracts as in the staminate inflorescence; inflorescence axes bearing distichous, imbricate, unarméd bracts to 12 cm or more long, tubular in the lower third, with a triangular limb, net-like as in the staminate, but the net-work expanding as the fruits develop, persistent and conspicuous; rachillae shorter than the net-like bracts, to 10 cm long at anthesis, bearing up to 20 distichously arranged rachilla bracts, each subtending a single pistillate flower; first rachilla bract 2-keeled; other bracts mid-brown, to c. 1 cm long, tubular in the lower 5 mm, long-apiculate, striate, with ciliate margins; rachilla bracts enclosing two further bracts below the pistillate flower, one prophyllar, to 5 mm long, with 2 keels, the other a bracteole to 5 mm long, tubular in the lower 3 mm, with a triangular limb; margins of both bracts ciliate. Pistillate flower to 7 mm long; calyx to c. 7 mm long, tubular, striate in bud, with 3 short triangular lobes to 0·8 mm × 0·6 mm these latter becoming longer by splitting of the calyx tube;
Fig. 3. Retispatha dumetosa. Details of pistillate inflorescence. A infructescence (medial portion) × 1/2; B detail of rachilla × 1/2; C rachilla bract × 3; D pistillate flower bud with prophyll and bracteole × 4; E pistillate flower bud × 4; F pistillate flower bud, calyx removed × 4; G pistillate flower, two corolla lobes removed × 3; H vertical section of ovary before anthesis × 4; J pistillate flower after anthesis × 4; K mature fruit × 1; L transverse section of fruit × 1. All from Dransfield 4403. Drawn by A. Davies.
corolla tubular, striate, in bud slightly shorter than the calyx, also with 3 short lobes, these becoming longer by the splitting of the tube; staminodes conspicuous, slightly epipetalous, with filaments joined laterally to form a short tube, c. 1 mm long; anthers to 1.5 mm long; ovary ovoid, to $4 \times 2$ mm, tipped by 3 conspicuous reflexed fleshy stigmas, borne on a conical non-scaly beak, elsewhere covered in reflexed scales; locules 3, almost complete, with one anatropous ovule in each locule.

Mature fruit pale brown (mid-green when immature), obpyriform, to $20 \times 1.8$ mm, tipped by a beak to 3 mm long and the remains of the stigmas, covered in 15 vertical rows of pale brown scales with paler margins and a thin, much darker, intra-marginal line, the scales about $6 \times 4$ mm, deeply grooved along the midline. Seed 1, with a thin, sweet, brown sarcotesta; diaspore faintly angled, with a flattened surface, $15 \times 10 \times 9$ mm; endosperm homogeneous, bony, white; embryo conical, basal. Germination adjacent-ligular; eophyll pinnate with c. 4 ciliate-hairy leaflets on each side of the rachis.

**Borneo. Kalimantan (E):** Balikpapan, Kenangan, P.T. ITCI Concession Dransfield 4403 (♀; holotype K; isotypes BO, L) & 4410 (♀; BO, K, L). **Kalimantan (S):** Ulu Sungei Selatan, Muara Uya, Jaro, Gunung Sarempaka, Dransfield 2333 (sterile; BO); Ulu Barabai, Kiu, Datar Alai (foothills of Gunung Besar), Dransfield 2830 (♀; BO, L) & 2840 (♀; BO, L). **Sarawak:** First Division: Semongok, near Kuching, Dransfield et al. 4632 (sterile; K, KEP, SAR); Gunung Matang, near Kuching, Dransfield et al. 4726 (♀; K, KEP, SAR). Fourth Division: Gunung Mulu National Park, Ulu Sungei Berar, Chai S39630 (♀ BH, K, SAR).

**Vernacular names.** ‘Howi tebu bruang’—bear’s sugar-cane rattan—(Orang Ulu Sungei Selatan); ‘Wai-enang’ (Orang Berawan).

**Habitat.** Retispatha dumetosa appears to favour damp hollows on hillsides or streamsides in lowland and hill mixed Dipterocarp forests at altitudes ranging from 25–500 m above sea-level. There is little peculiar about its habitat, and it is most surprising that it is not more frequent. In all localities where it has been observed, the rattan tends to form one or a few thickets only. For example, at the foot of G. Besar in the Pegunungan Meratus, though the area was searched thoroughly in the hope of finding stamate material, only four thickets of the palm were encountered. On Gunung Matang near Kuching it grows in a steep-sided valley with many other species of rattan—a valley very similar to that described by Beccari on p. 114 of his ‘Wanderings in the Great Forests of Borneo’.

**Relationships with other genera**

Retispatha is clearly a member of the Calamus alliance of dioecious, climbing Lepidocaryoid palms (see Moore, 1973); within the alliance, its relationships are less obvious. In some ways (in the arrangement of bracts and flowers on the rachillae) it comes close to the grouping of Calospatha, Calamus, Ceratolobus and Daemonorops, yet it is immediately distinguishable by the absence of a sterile staminate flower, borne with the pistillate flower—such an acolyte flower is consistently present in these four genera. Further, the remarkable distichous bracts subtending the rachillae are reminiscent of Plectocomia—yet the flowering is pleonanthic rather than hapaxanthic, and,
as stated above, the arrangement of bracteoles and flowers is closer to that of the Calamus grouping. In habit, there is some resemblance to Calospatha (except that Calospatha is always solitary, single-stemmed). In vegetative details, the palm is unlike any other Bornean species of rattan. Retispatha perhaps occupies a position intermediate between Calamus (especially the group of species related to C. ulur Becc.) and Plectocomia. I do not however believe that this position is of phylogenic significance; rather, it seems more likely that the bract arrangement of Retispatha is a parallel development. I believe it is best to regard Retispatha as a relic of rattan evolution surviving in one of the centres of greatest diversity. Perhaps its position will be more clearly understood when a sectional revision of Calamus and Daemonorops is completed, especially when the enigmatic complex of Calamus ulur, C. semoi Becc., C. pseudoulur Becc., C. eriocanthus Becc. and related species is better understood.

References


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