



Two new species of *Chrysalidocarpus* (Arecaceae, Arecoideae, Areceae, Dypsidinae)

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Abstract

Chrysalidocarpus is the second-largest genus in Arecaceae subtribe Dypsidinae, comprising 60 species distributed across Madagascar, the Comoro Archipelago, and Pemba Island. Since 2022, five new species have been described from cultivation and here we describe and illustrate two more new species, *C. comptus* and *C. marcusorum*, based on specimens cultivated in Hawai'i.

Key words: Horticulture, Malagasy palms, Palmae, Taxonomy

Introduction

The palm tribe Dypsidinae (Arecaceae, Arecoideae, Areceae) represents a remarkable evolutionary radiation (Eiserhardt *et al.* 2024). Most of its species are found in Madagascar, with a few species occurring in the Comoro Islands and Pemba (Dransfield *et al.* 2008). The group is morphologically diverse, comprising six genera and 185 currently recognised species (Eiserhardt *et al.* 2022, POWO 2025) that range from small understory palms with entire leaves and spicate inflorescences to large canopy trees with pinnate leaves and inflorescences branched to several orders (Dransfield & Beentje 1995).

Many new species continue to be described in Malagasy palms and Arecaceae subtribe Dypsidinae is no exception, having grown by 25% (*ca.* 40 new species) in the last two decades (Dransfield *et al.* 2008). This rampant rate of species discovery is due to the renowned biological hyperdiversity of the island (Antonelli *et al.* 2022), including an abundance of micro-endemics (Wilmé *et al.* 2006, Vences *et al.* 2009), paired with poor infrastructure that makes biological exploration of the island difficult. Somewhat paradoxically, many recent discoveries of Malagasy palm species were made in gardens, not *in situ* on the island (e.g. Dransfield & Marcus 1993, Turk & Rakotoarinivo 2023). Malagasy palms are popular ornamental species and sought after by palm enthusiasts, and many species enter the horticultural trade long before being discovered by scientists in the wild. For example, in *Chrysalidocarpus* Wendland (1878: 117), the second largest genus in Dypsidinae comprising 60 species of moderate to very tall tree palms (Eiserhardt *et al.* 2022), several new species have been described from cultivation just in the last three years (e.g. Dransfield *et al.* 2023a, 2023b, Hodel 2025).

Here, we describe and illustrate two new species, *Chrysalidocarpus comptus* and *C. marcusorum*, which are already known in cultivation under the informal names *C.* “bef” and *C.* “dark mealybug”, respectively. Although their exact origin is uncertain, both are reported to have originated from seed collected in Madagascar several decades ago. Madagascar’s biodiversity is under constant threat and, as many palms continue to be endangered (Rakotoarinivo *et al.* 2014, Bellot *et al.* 2022), the frequent discovery of new species from cultivation underscores the crucial role of *ex situ* collections in documenting, preserving, and studying species that may already be endangered in the wild (Ralimanana *et al.* 2022).

Taxonomic treatment

1. *Chrysalidocarpus comptus* P.L.Ferreira, J.Dransf. & W.J.Baker, *sp. nov.* **Type:**—USA. Hawai'i: Island of Hawai'i, Mountain View, Floribunda Palms & Exotics, 2 Feb 2023, *W.J. Baker & J. Marcus 1479* (holotype K!). Figs. 1–4.

Diagnosis:—Tall and slender clustering-stemmed tree palm with arcuate rachis and ascending leaflets, the sheaths with fimbriate scales mixed with long, twisted brown hairs and wax-like indumentum; inflorescences infrafoliar, upright to arching, branched to 2 (rarely 3) orders; fruit obovoid; endosperm homogeneous. Superficially similar to *Chrysalidocarpus lutescens* Wendland (1878: 117), to which it appears not to be closely related from molecular studies, *C. comptus* is distinguishable by its much larger size, its stiff, less obviously arcuate leaves with rigid, regularly arranged, closely spaced leaflets, its infrafoliar inflorescence and its pinnate eophyll.

Moderately robust, clustering tree palm to 10 m tall, bearing 6–7 leaves in crown. **Stem** 10–16 cm in diam.; leaf scars prominent, grey-white; internodes 8 cm, green with white wax. **Leaf** ca. 175 cm long including petiole; sheath 40–85 cm long, 18 cm diam., tubular, adaxially glabrous, abaxially with thin wax-like indumentum throughout and abundant beige, fimbriate scales mixed with long, twisted, brown hairs towards sheath mouth, sheaths forming crownshaft to 100 cm long, 20 cm wide; petiole ca. 4–9 cm long, concave on adaxial surface, indumentum as sheath; rachis arcuate, ca. 150 cm long, white wax-like indumentum extending along rachis, with indumentum as sheath near base and becoming glabrous towards apex, except for sparse punctiform brown scales; leaflets 60–83 each side of rachis, linear, ascending, regularly arranged in one plane, borne 2 cm apart, more or less concolorous, glabrous, but with sparse ramenta on abaxial surface of midrib, both leaflet surfaces with abundant minute brown dots, transverse veinlets inconspicuous; basal leaflets ca. 92 cm long, 0.5–1.4 cm diam.; middle leaflet 77–93 cm long, 1.1–1.9 cm wide; apical leaflets ca. 13–16 cm long, 0.1–0.3 cm diam. **Inflorescence** ca. 100 cm long, infrafoliar, spreading, upright to arching, branched to 2(–3) orders, axes yellow to green; prophyll ca. 19 cm long, ca. 6.2 cm wide, green, strongly 2-keeled and with rounded triangular beak, opening apically, glabrous, with minute brown dots throughout; first peduncular bract 47.5 cm long, 14.5 cm wide, leathery, with beak ca. 2 cm long and 1 cm diam., splitting longitudinally, adaxial surface glabrous with sparse black dots, abaxial surface with very thin floccose indumentum, attached ca. 3 cm above prophyll insertion; peduncle 25–30 cm long, 3 cm diam., puberulent; primary branches ca. 30, up to 43 cm long, rachillae 5.5–17.0 cm long, 0.3–0.5 mm in diam., rachilla bracts inconspicuous; floral triads ca. 0.2–0.5 mm apart, spirally arranged. **Male flower** ca. 3.5–4.0 mm long, ca. 2.8–3.0 mm in diam. in bud (only juvenile buds seen); sepals ca. 2.6–3.0 mm long, ca. 2.8–3.0 mm wide, cucullate with sharp keel, imbricate, pale yellow-brown, glabrous, margin slightly ciliate; petals ca. 3.3 mm long, ca. 2.5 mm wide, rounded, pale yellow-brown, glabrous; stamens 6; filaments ca. 1 mm long (juvenile), free, columnar, yellow; anthers 1.3–1.7 mm long, 0.9–1.0 mm wide, oblong, yellow; dorsifixed; dehiscence latrorse; connective dark brown; pistillode ca. 0.8 mm long, 0.5 mm in diam., bottle-shaped, dark brown. **Female flower** 2.1–2.3 mm long, 1.8–2.0 mm in diam. (only juvenile buds seen), borne only on the proximal quarter of the rachilla; sepals 3, 1.8–2.0 mm long, 2.0–2.2 mm wide, cucullate with sharp keel, yellow, margin slightly ciliate; petals 3, 1.9–2.0 mm long, 1.8–2.0 mm wide, rounded, yellow; gynoecium immature. **Fruit** 1.9–2.0 cm long, 1.0–1.3 cm in diam., obovoid, stigmatic remains basal, green, glabrous; endocarp ca. 1.7–1.9 cm long, ca. 0.9–1.0 cm in diam., obovoid, very thin, brittle with conspicuous network of pale brown fibres. **Seed** ca. 1.7–1.9 cm long, 0.9–1.0 cm in diam., obovoid; endosperm homogeneous; embryo sub-basal. **Eophyll** pinnate.

Etymology:—The epithet *comptus* refers to the neat and elegant appearance of this species.

Distribution:—Unknown. This palm is currently only known from cultivation (e.g. in Australia, North America, and Hawai'i). The material studied here was sourced from Floribunda Palms & Exotics in Hawai'i. The seed of this palm was collected in the 1990s by renowned Malagasy horticulturist Alfred Razafindratisira in an unknown location and reached Floribunda Palms & Exotics via growers in Australia (J. Marcus, pers. comm.). The informal name “bef” used in horticulture may be a local vernacular name, which suggests that it might stem from the Befotaka area in the Atsimo-Atsinanana region of south-eastern Madagascar (M. Rakotoarivino, pers. comm.).

Taxonomic notes:—The species *Chrysalidocarpus comptus* was previously included in the phylogenomic analysis of the tribe Dypsidinae (Eiserhardt *et al.* 2022) under the name ‘*C. sp. 1*’, an undescribed taxon at the time. The species was poorly supported as sister to a clade comprising robust, solitary-stemmed species *C. ovojavavy* (Eiserhardt & W.J.Baker in Eiserhardt *et al.* 2018: 4) Eiserhardt & W.J.Baker in Eiserhardt *et al.* (2022: 1184), ‘*C. sp. 5*’, *C. mananjarensis* Jumelle & Perrier de la Bâthie (1913: 33), *C. malcomberi* (Beentje in Dransfield & Beentje 1995: 165) Eiserhardt & W.J.Baker in Eiserhardt *et al.* (2022: 1184), ‘*C. sp. 2*’, and *C. pilulifer* Beccari (1906: 37). A recent study of the tribe Dypsidinae (Ferreira *et al.* unpubl.), which includes additional taxa and genes, recovered the same



FIGURE 1. Habit of *Chrysalidocarpus comptus*, cultivated at Floribunda Palms & Exotics, Hawai'i. Photo by William J. Baker.



FIGURE 2. *Chrysalidocarpus comptus*, crown showing inflorescences, crownshaft, and indumentum on sheaths and stem. Photo by William J. Baker.



FIGURE 3. *Chrysalidocarpus comptus*. **A.** Fully expanded inflorescence. **B.** Detail of rachilla with male flowers. Photos by John Dransfield.

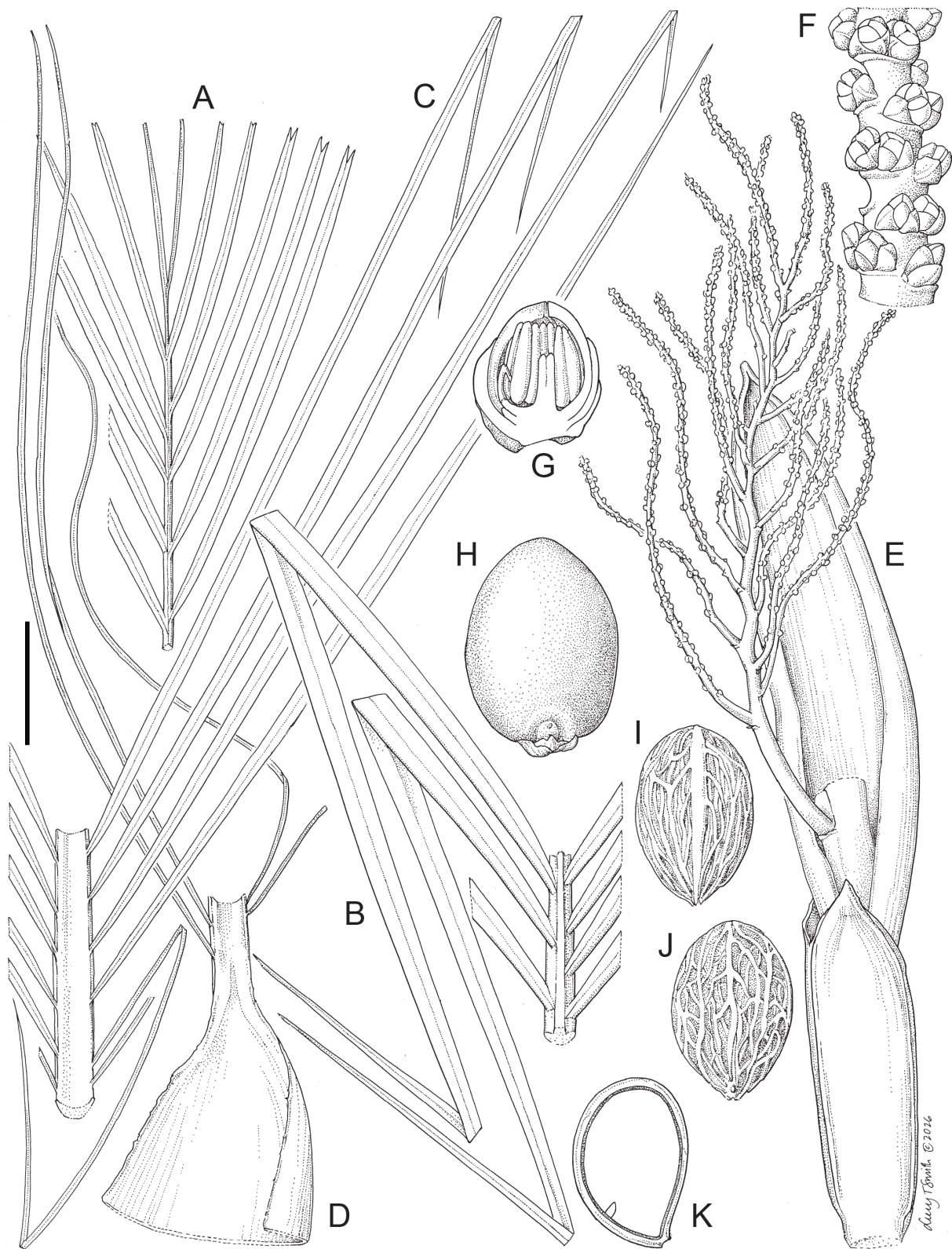


FIGURE 4. *Chrysalidocarpus comptus*. **A.** Leaf apex. **B.** Leaf mid-portion. **C.** Leaf base. **D.** Upper portion of leaf sheath showing petiole and basal leaflets. **E.** Basal portion of inflorescence. **F.** Portion of rachilla with male flower buds. **G.** Male flower in longitudinal section. **H.** Fruit showing basal stigmatic remains. **I, J.** Endocarp in two views. **K.** Seed in longitudinal section. Scale bar: A–D = 8 cm; E = 6 cm; F = 7.5 mm; G = 2.5 mm; H–K = 1 cm. All from *Baker & Marcus 1479*. Drawn by Lucy T. Smith.

clade, now with stronger support. *Chrysalidocarpus comptus* is immediately distinguishable from the members of this clade by its multi-stemmed habit, its rigid leaves with strictly regularly arranged, neat leaflets and the broad, spreading inflorescence. The multi-stemmed habit is more reminiscent of the widely cultivated *C. lutescens*, but *C. comptus* is an altogether much more robust species, and its stiff, neat leaflets are different from the strongly arcuate leaflets in *C. lutescens*. Furthermore, inflorescences of *C. comptus* are infrafoliar rather than the usually interfoliar state in *C. lutescens*. The seed shape initially reminded growers of *C. onilahensis* Jumelle & Perrier de la Bâthie (1913: 37) but it produced a distinctive pinnate eophyll on germination, whereas the eophyll of *C. onilahensis* is bifid (J. Marcus, pers. comm.). A second seed introduction of “bef” was made under the name *C. brevinodis* Perrier de la Bâthie (1939: 47) (J. Marcus, pers. comm.), but this species is currently regarded as a synonym of *C. onilahensis*. Molecular evidence does not support a close relationship between *C. comptus* and *C. onilahensis*.

Specimens examined:—USA. Hawai’i. Island of Hawai’i, Mountain View, Floribunda Palms & Exotics, 17 Feb 2015, *J. Dransfield, J. Marcus & S. Dransfield JD7840* (K!); 02 Feb 2023, *W.J. Baker & J. Marcus 1479* (holotype K!).

2. *Chrysalidocarpus marcusorum* P.L.Ferreira, J.Dransf. & W.J.Baker *sp. nov.* **Type:**—USA. Hawai’i: Island of Hawai’i, Mountain View, Floribunda Palms and Exotics, 2 Feb 2023, *W.J. Baker & J. Marcus 1477* (holotype K!). Fig. 5–8.

Diagnosis:—Tall single-stemmed tree palm with tristichously arranged leaves with numerous closely-spaced, regularly arranged pendulous leaflets, the sheaths with abundant lacinate dark scales and white wax; inflorescences infrafoliar, branched to 2 (rarely 3) orders; fruit ovoid; endosperm ruminant. Similar to *C. tsaravoasira* (Beentje in Dransfield & Beentje 1995: 154) Eiserhardt & W.J.Baker in Eiserhardt *et al.* (2022: 1185) but differing in the strictly regularly arranged leaflets and the dark lacinate scales on the petiole and sheaths.

Robust, solitary tree palm to ca. 10 m tall, bearing 8–9 leaves in the crown, arranged more or less tristichously. **Stem** 26–35 cm in diam.; leaf scars prominent, white; internodes ca. 25 cm, bright green and covered with caducous white wax-like indumentum when newly exposed, later becoming darker and duller green, eventually brown. **Leaf** 500–573 cm long including petiole; sheath 100–140 cm long, 35–80 cm diam., closely nearly tubular, adaxially glabrous and brilliant yellow when newly fallen, abaxially densely covered with white powdery, wax-like indumentum, abundant dark, lacinate peltate scales, sheaths forming crownshaft ca. 150 cm long, 40 cm wide; petiole ca. 5–16 cm long, 5 × 5 cm in cross section, adaxially deeply channelled, abaxially covered with dense powdery white indumentum, scattered dark punctiform scales and sparse, scattered elongate lacinate scales (ramenta) 3–7 mm long, 1 mm diam.; rachis ascending, ca. 384–457 cm long, adaxially deeply channelled near base, becoming angled distally, rounded abaxially throughout, covered with wax-like and indumentum similar to sheath; leaflets ca. 90–100 each side of rachis, linear, pendulous, regularly arranged in one plane, borne 4.5 cm apart, more or less concolorous, abaxial surface with sparse, dark, punctiform scales, more dense at leaflet margins, sparse ramenta on midrib, adaxial surface glabrous, transverse veinlets inconspicuous; basal leaflets ca. 143 cm long, 0.8–1.1 cm diam.; middle leaflet 144–170 cm long, 3.5–5.5 cm; apical leaflets ca. 47 cm long, 1.9 cm diam. **Inflorescence** ca. 180 cm long, infrafoliar, spreading, arching with pendulous rachillae, branched to 2(–3) orders, yellow when flowering, green when fruiting; prophyll ca. 34 cm long, ca. 11 cm wide, dark orange-yellow, strongly 2-keeled and with rounded triangular beak, opening apically, indumentum as sheath; peduncular bract not seen; peduncle to 30 cm long; primary branches ca. 40, up to 100 cm long; rachilla 20–60 cm long, 0.4 cm diam., becoming pendulous in fruit, glabrous, cream at first, turning green as fruits mature, rachilla bracts low, inconspicuous; triads 0.4–0.5 cm apart. **Male flower** (described from photographs, no specimen seen): sepals 3, ca. 2 mm wide, ca. 3.5 mm long, cream, low, rounded; petals 3, ca. 6 mm long, ca. 5 mm wide, cream; stamens 6; filaments ca. 10 mm long, scarcely united at base, columnar, cream; anthers ca. 2.0–2.5 mm long, apparently dorsifixed and with dehiscence laterorse; connective dark brown; pistillode ca. 3.5–5.5 mm long. **Female flower** globose, 5 mm diam.; sepals imbricate, 2 mm long, 3 mm diam., rounded, striate; petals imbricate, rounded, 3.5 mm long, 4 mm diam., with short valvate tips; ovary rounded, 3 mm diam. **Fruit** 17–19 mm long, 13–19 mm in diam., ovoid, stigmatic remains basal, smooth, shiny golden yellow turning orange brown, glabrous; endocarp 16–17 mm long, 9–10 mm in diam., ovoid, very thin, brittle with conspicuous network of pale brown fibres. **Seed** ca. 15 mm long, ca. 8 mm in diam, ovoid; endosperm with peripheral shallow ruminations; embryo sub-basal.



FIGURE 5. *Chrysalidocarpus marcusorum* with Jeff Marcus, cultivated at Floribunda Palms & Exotics, Hawai'i. Photo by Sujin Marcus.

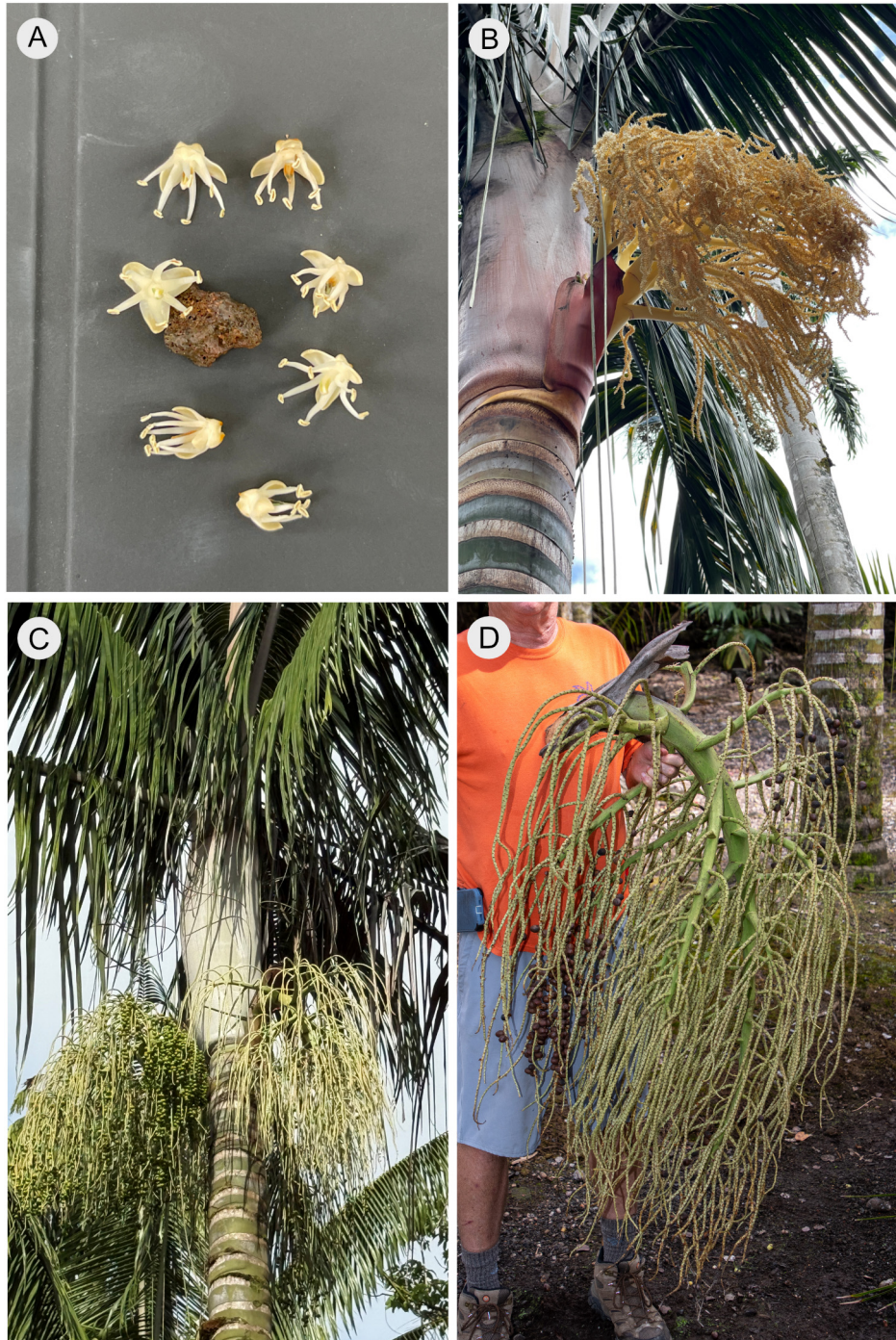


FIGURE 6. *Chrysalidocarpus marcusorum*, cultivated at Floribunda Palms & Exotics, Hawai'i. **A.** Male flowers. **B.** Young inflorescence. **C.** Habit showing pendulous leaflets and inflorescence. **D.** Inflorescence being held by Jeff Marcus. Photos by Wolf Eiserhardt (A–B), Sujin Marcus (C), William J. Baker (D).



FIGURE 7. *Chrysalidocarpus marcusorum* scales. **A.** Dark brown scales resembling mealybugs on petiole. **B.** Small and larger brown scales on leaf sheath. Photos by William J. Baker (A) and John Dransfield (B).

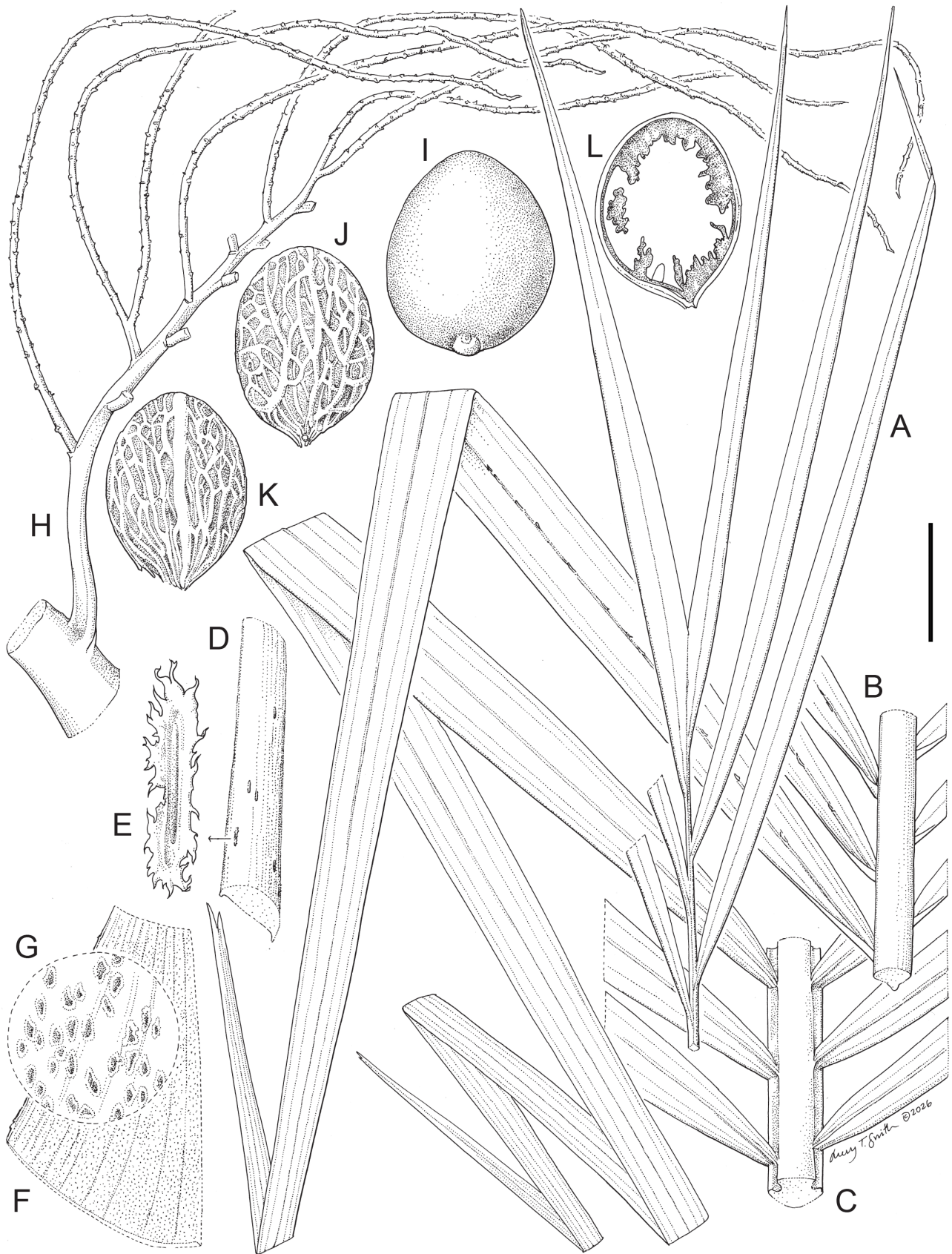


FIGURE 8. *Chrysalidocarpus marcusorum*. **A.** Leaf apex. **B.** Leaf mid-portion. **C.** Leaf base. **D.** Portion of petiole. **E.** Detail of elongate lacinate scale (“mealybug” scale) on petiole. **F.** Upper portion of leaf sheath. **G.** Detail of peltate scales on leaf sheath. **H.** Portion of inflorescence. **I.** Fruit showing basal stigmatic remains. **J, K.** Endocarp in two views. **L.** Seed in longitudinal section. Scale bar: **A–C, H** = 8 cm; **D, F** = 6 cm; **E, G** = 3.3 mm; **I–L** = 8.5 mm. **A–C, H–L** from *Baker & Marcus 1477*; **D–G** from *Dransfield et al. JD7802*. Drawn by Lucy T. Smith.

Etymology:—The epithet *marcusorum* honours Jeff and Sujin Marcus of Floribunda Palms & Exotics in Hawai'i, who have done so much to raise the profile of palm horticulture, bringing to light many important species new-to-science in their diverse collection of living palms. In the horticultural community, *C. marcusorum* has been informally known by the name “dark mealybug” on account of the brown mealybug-like scales found on the petiole and sheaths, especially in younger plants. Such scales also occur in *C. mananjarensis*, which is informally known as “mealybug” in cultivation, although the scales in this species are white.

Distribution and habitat:—Unknown. This palm is currently only known from cultivation (e.g. in Australia, Thailand, North America, and Hawai'i). The material studied here was sourced from Hawaii at Floribunda Palms & Exotics in Hawai'i. It is believed to have been introduced to cultivation in the 1990s by Alfred Razafindratisira (J. Marcus, pers. comm.).

Taxonomic notes:—Preliminary phylogenomic analysis strongly supports this species as sister to *Chrysalidocarpus loucoubensis* (Jumelle 1933: 17) Eiserhardt & W.J.Baker in Eiserhardt *et al.* (2022: 1184) in a well-supported clade with *C. tanalensis* (Jumelle & Perrier de la Bâthie 1913: 18) Eiserhardt & W.J.Baker in Eiserhardt *et al.* (2022: 1185) and *C. tsaravoasira*. The palm has tristichously arranged leaves and regularly arranged pendulous leaflets and resembles other tall canopy species such as *C. tsaravoasira*, *C. pilulifer*, and *C. loucoubensis*, and it has not been easy to distinguish it from these species. *Chrysalidocarpus marcusorum* is unique in its distinctive dark scales that stand out against the grey indumentum of the sheaths and petioles, and is the only species to bear such scales along with strikingly pendulous and regularly arranged leaflets (Fig. 5, Fig. 6 C, and Fig. 7 A–B).

Specimens examined:—USA. Hawai'i: Island of Hawai'i, Mountain View, Floribunda Palms, 15 Feb 2015, J. Dransfield, J. Marcus & S. Dransfield JD7802 (K!); 2 Feb 2023, W.J. Baker & J. Marcus 1477 (holotype K!).

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