an anther ca. 0.6 mm long, the antesepalous anthers slightly above the antepetalous, all anthers held inwards in bud, obscuring the carpels; carpels 3, distinct, ca. 1 mm high, each tipped with a glabrous triangular style, otherwise densely silky-hairy; ovule bitegmic, anatropous to hemianatropous. For floral anatomy see Uhl (1978).

Young fruit grey, densely covered with silky hairs, mature fruit unknown.

Distribution: confined to a small area of limestone on Pulau Dayang Bunting in the Langkawi Islands off the northwestern coast of peninsular Malaya near the Thai border.

Furtado (1941) records the presence of unisexual and hermaphrodite flowers in this species. Whitmore (1971) found only hermaphrodite flowers in both herbarium and fresh specimens. Uhl (1978) similarly has found hermaphrodite flowers only.

3. **Maxburretia furtadoana** Dransfield, **sp. nov.** (Fig. 1–6).

Maxburretia rupicola sensu Dransfield not Ridl., Principes **15**: 9. 1971.

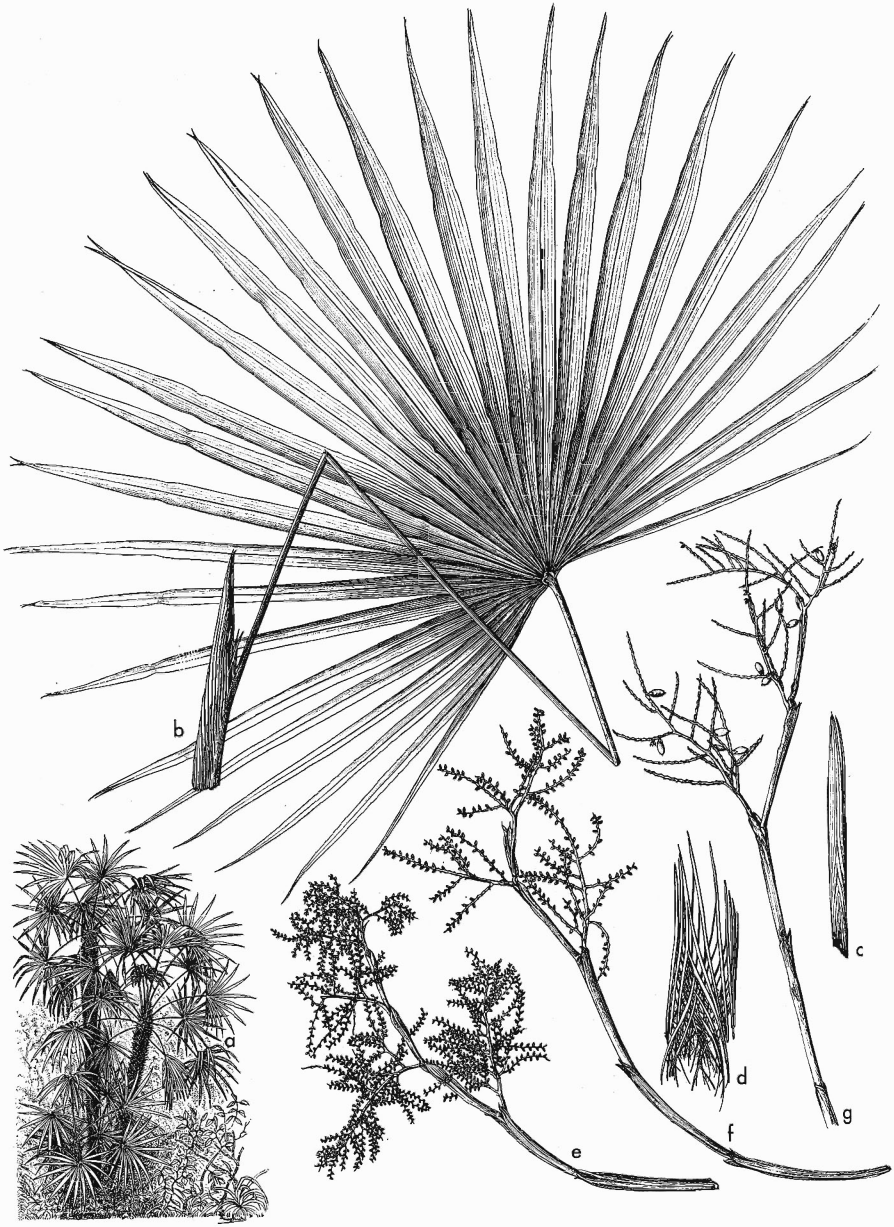
M. rupicolae affinis sed tubo staminalis in flore masculo evoluto et vagina folii ita expansa ut verticilla partialis spinarum longarum efficitur differt.

Holotype: *Dransfield 2349* (K).

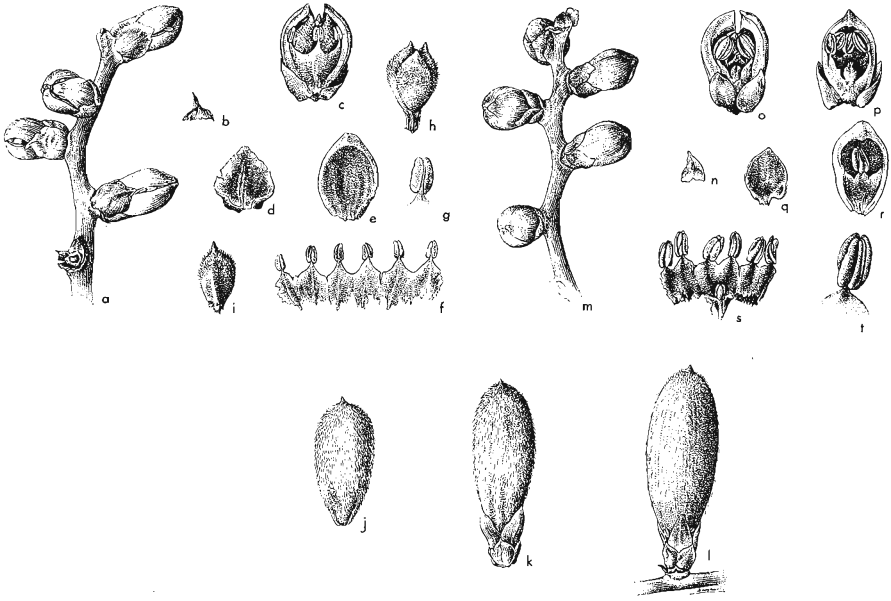
Clustering, dioecious, pleonanthic fan palm, spreading by basal suckers to produce clumps of up to 10 or more stems; stems to 3 m tall at maturity, rarely to 5 m, 5 cm in diam.; base of stem free of leaf sheaths, pale brown, with close vertical cracking and leaf sheath scars, upper 1–2 m or more of stem clothed with long-persisting leaf sheaths, the combined diameter 12–15 cm.

Leaf sheath, when young, erect, sheathing, composed of 15 or more hard, coarse, woody fibers to 3 mm wide, the outer fibers softly brown-hairy, in age rotting and expanding to form an open network of dirty brown fibers, the free ends spiny, sticking out from the skin, thus producing a dense spiny covering to the stem; petiole to 50 cm long, in exposed plants shorter, rarely not more than 30 cm, in trunkless juveniles longer, sometimes up to 70 cm, unarmed, oval in cross section except at the base where semicircular, 4 × 3 mm in diam., pale yellowish-green; lamina rounded in general outline, largely held stiffly in one plane, to 75 cm in diam., largest radius along midline, ca. 50 cm from insertion to tip of apical leaflet, lamina divided into 25–30 single-fold leaflets, in upper part of leaf divided to half the radius, the divisions decreasing in length towards the outer edges of the lamina, where divided to 9/10 of the radius, leaflets further divided at the apex to 1–5 cm, to 1.5 cm wide, upper surface pale green, more or less glabrous, marked with prominent longitudinal veins, transverse veins obscure, and lower surface covered with thin white wax, abaxial ribs yellowish, bearing chaffy brown hairs; abaxial hastula absent or minutely present as a thin flange ca. 3 mm in height, petiole scarcely continuing into the lamina, adaxial hastula present, triangular, flattened, erose, black-edged, with chaffy grey-brown hairs.

Inflorescences unisexual, axillary, arching out of the leaf axils: staminate



5. *Maxburretia furtadoana.* **a**, habit, much reduced; **b**, whole leaf with sheath young and expanded, × ¼; **c**, unexpanded leaf sheath, × ¼; **d**, expanded leaf sheath, × ¼; **e**, staminate inflorescence, × ¼; **f**, pistillate inflorescence, × ¼; **g**, young infructescence, × ¼.



6. *Maxburretia furtadoana.* **a**, pistillate rachilla, × 6; **b**, bracteole, × 6⅔; **c**, pistillate flower with one petal removed, × 6⅔; **d**, sepal of pistillate flower from within, × 6⅔; **e**, petal of pistillate flower from within, × 6⅔; **f**, staminodial ring opened out, × 6⅔; **g**, staminode, × 13⅓; **h**, gynoecium of three distinct carpels, × 6⅔; **i**, one carpel, adaxial surface, × 6⅔; **j**, **k**, **l**, fruits of varying degrees of maturity, × 3⅓; **m**, staminate rachilla, × 6; **n**, bracteole, × 6⅔; **o**, **p**, staminate flowers with one (o) and two (p) petals removed, × 6⅔; **q**, sepal of staminate flower from within, × 6⅔; **r**, petal of staminate flower from within showing one stamen, × 6⅔; **s**, androecium opened out, showing central pistillode, × 6⅔; **t**, one stamen, × 13⅓.

inflorescence usually more slender and more highly and divaricately branched than the pistillate, branching to 3 orders, 25–40 cm long, with 3–5 primary branches (partial inflorescences), axis flattened at base, to 5 mm wide, 3 mm thick, densely flocculent-hairy at edges; prophyll adnate to the axis, to 7 cm long, 7 mm wide, tubular, irregularly bilobed to 1 cm at apex, lobes sometimes further divided, bracts subtending branches decreasing in size distally, uppermost bracts ca. 1 cm long, hardly tubular, prophyll and bracts with scattered chaffy hairs along margins, otherwise glabrous; subtended branch adnate to axis often for a distance equal to the length of the subtending bract, first order branches ca. 1.5 mm in diam.; rachillae to 4 cm long, ca. .75 cm in diam., bearing flowers singly or in pairs, each flower and/or flower pair subtended by a minute, triangular, brown, membranous bracteole: staminate flowers globular, ca. 2.5 mm long, pale yellow at anthesis, with no detectable scent, calyx of 3 distinct, imbricate, triangular, glabrous sepals ca. 1.5 mm wide, tending to be erose at margins; corolla of 3 ovate petals with thick tips, ca. 2.25 mm long, 1.2 mm wide, united for up to ½ their length; stamens 6, the filaments fused into a staminal tube ca. 1 mm long, adnate to the petals, the free filaments ca. 0.1 mm long, hence borne

epipetalously, anthers medifixed; pistillode ca. 0.5 mm high, consisting of 3 distinct or obscurely united carpels.

Pistillate inflorescences superficially similar to staminate but branching to 2 orders only, slightly more robust and with branches less divaricate, and bearing solitary pistillate flowers: pistillate flower at anthesis creamy-yellow, with no detectable scent, ca. 2.5 long, 2 mm wide; calyx of 3 distinct, imbricate, rounded sepals ca. 0.9 mm high, 1 mm wide, with erose margins; corolla of 3 petals ca. 2.5 mm long, 1.5 mm wide, joined in the lower ⅓ to form a short corolla tube; staminodes 6, joined below into a staminodial tube adnate to the corolla, filaments short, tipped with flattened empty anthers ca. 0.3 mm long; carpels 3, free except at the very base where minutely joined, ca. 1.5 mm long, 0.5 mm wide, tapering to pyramidal style tipped by a pointed stigma, upper part of carpel densely covered with silky hairs; ovule bitegmic, anatropous, basally attached, with a conspicuous funicular aril. For floral anatomy see Uhl (1978).

Young fruit greenish, covered in silky hairs, more or less mature fruit pale yellowish-green (? ripening black), glabrescent except near tip, borne on the persistent perianths, usually only one carpel developing, narrowly ovoid, 8 mm long, 4 mm wide, apiculate in stigmatic remains; epicarp more or less smooth; mesocarp ca. 0.2 mm thick; endocarp scarcely differentiated; seed ca. 7 mm long, 3 mm wide, with a slight dark brown, elongate postament; the embryo lateral ca. 2 mm above the base opposite the postament; endosperm homogeneous.

Distribution: South Thailand, where known only on two adjoining limestone hills near Surat. These hills are of massive karstic construction and difficult of access. *Maxburretia furtadoana* is apparently confined to the rather exposed upper slopes, in stunted forest, and to crevices in the precipices. It is possible that it may occur elsewhere on neighboring limestone hills.

Specimens examined: SOUTH THAILAND: Khao Changai, common on limestone hilltop and precipices, 19 Jan 1972, *J. Dransfield 2349* (K, holotype, staminate plant), *2350* (K, pistillate plant) common on limestone ridge, 4th Unesco Training Expedition, 22 Sept 1963, *T. Smitinand & H Sleumer 1230* (BKF, BO, K, L, SING).

The curious leaf sheaths, expanding to form partial whorls of spines, are highly distinctive; such leaf-sheath fiber spines are known elsewhere only in species of the genera *Coccothrinax* Sarg. [e.g. *C. pseudorigida* León], *Trithrinax* Mart. [e.g *T. acanthocoma* Drude], and in *Zombia* L. H. Bailey [*Z. antillarum* (Descourt. ex B. D. Jacks.) L. H. Bailey].

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