

***Licuala stenophylla* Hodel sp. nov. Fig. 14-15.**

Licuana triphyllae Griff. et *L. filiformi* Hodel affinis sed segmentiis angustioribus differt. Typus: Thailand, Satun, 500 m elev., D.R. Hodel, P. & R. Vatcharakorn 1660 (Holotypus BK).

Solitary, acaulescent, understory palmet to 90 cm tall. Leaves 9, palmately divided, arising from the leaf litter in a spreading rosette; petiole 40-50 cm long, margins sparsely armed in basal 2/3 with reflexed needle-like spines 3.25 mm long; blade 30 x 40 cm, 5/8-3/4 orbicular, divided to base into 11 segments broadest toward apex, middle one largest, 20-30 x 5.5 cm, 10-nerved, others 20-30 x 0.9-2.4 cm, 1-3 nerved, 30-40 nerves total per blade, middle segments truncately praemorse, the lobes very small, lateral and basal segments truncately to obliquely praemorse, the lobes more prominent, the 3 middle segments on a subpetiole 3 cm long, the middle segment on a 2nd subpetiole 2 cm long. Inflorescences 2-3, interfoliar, 30 cm long, ascending, with 3-4, branched partial inflorescences to 5 cm long; peduncle 20 cm long, prophyll 4 cm long, attached 8 cm above base of peduncle, tubular, obliquely open apically, peduncular bract 6 cm long, attached 1 cm above apex of prophyll and extending onto rachis and subtending lowest partial inflorescence; partial inflorescences 4-6 cm distant, each (except lowest one) subtended by bracts similar to prophyll; rachis 1 cm long; rachillae 3-6, these 1.5-4 cm long, +/- straight, only slightly flexuous; bracts, rachis, and rachillae with dense, white to brownish hairs. Flowers laxly arranged, placed on pedicels 0.5 mm high; flowers 2.5 x 2 mm, ovoid; calyx 1.75 x 2 mm, crown-like, sepals connate in basal 1/2, prominently lobed in apical 1/2, lobes triangular, acute, densely covered with short, white to brown hairs; corolla 2.5 mm high, petals connate in basal 1/2 and adnate to staminal ring, narrowly triangular in apical 1/2, valvate, acute-acuminate, densely covered with white hairs; stamens 6, staminal ring 1.25 mm high, equaling base of corolla lobes, filaments short, 0.4 mm long, anthers 0.4 mm long, dorsifixed near middle; pistil 1.75 mm high, ovary 1 x 1 mm, depressed-obovoid, densely covered with silver-white hairs in apical 1/2, style 0.75 mm long, slender. Fruits immature, 4.5 mm long, ellipsoid, green.

Licuala stenophylla occurs in wet hill forest in southwest peninsular Thailand. It is closest to *L. triphylla* and *L. filiformis* but differs from both in its long, narrow leaf segments. *L. filiformis* differs also in its filiform, conspicuously zigzag rachillae. The epithet is from the Greek *stenophyllus*, meaning narrow-leaved, and refers here to the narrow leaf segments.

***Pinanga badia* Hodel sp. nov. Fig. 16-17.**

Pinanga perakensi Becc. affinis sed foliis vaginis squamis badiis, fructibus minoribus differt. Typus: Thailand, Satun, 500 m elev., D.R. Hodel, P. & R. Vatcharakorn 1671 (Holotypus BK).

Clustered understory palm 3 m tall. Stems 2.3 cm diam., ringed, internodes 10 cm long, green with chocolate brown scales. Leaves 6, pinnate, ascending to spreading; sheath 30 cm long, tubular, forming a crownshaft, green with distinctive, pale-centered, chocolate-brown scales 0.3 mm long; petiole 50-90 cm long; rachis 1.8 m long; pinnae 20 on each side of rachis, 38 x 2.5 cm, +/- straight or only slightly falcate, acuminate, regularly inserted, 2-nerved, apical segments truncately praemorse, deeply bifid, lobes 2.5 cm long. Inflorescences 3-4, infrafoliar, 15-17 cm long; peduncle 3 cm long; prophyll and other bracts not seen; rachillae 3, these 13 cm long, drooping. Flowers in triads of center, later-opening pistillate flanked on each of two sides by earlier-opening staminate, triads close-set, distichously arranged, subtended proximally by a broadly triangular bracteole 1 mm high. Staminate flowers not seen. Pistillate flowers subtended by 2 tooth-like to awl-like, acute bracteoles 1.5 mm high, flowers 2.75 x 3 mm, subglobose; calyx and corolla similar, sepals and petals imbricate to apex, bowl-shaped, broadly rounded; pistil 2.75-3 mm high, ovoid, stigma with 3, thick lobes. Fruits 17 x 8 mm, narrowly ovoid, pinkish.

Pinanga badia occurs in wet hill forest in southwest peninsular Thailand. It is distinguished from other *Pinanga* of similar habit, such as *P. fractiflexa*, *P. malaiana*, and *P. perakensis*, by its leaf sheaths with distinctive, chocolate-brown scales and its small, narrow fruits. The epithet is from the Latin *badius*, meaning chocolate brown,



Fig. 15 *Licuala stenophylla*, middle segments with subpetioles, Hodel et al. 1660 (holotype).



Fig. 16 *Pinanga badia*, habit, Satun, Hodel et al. 1671 (holotype).

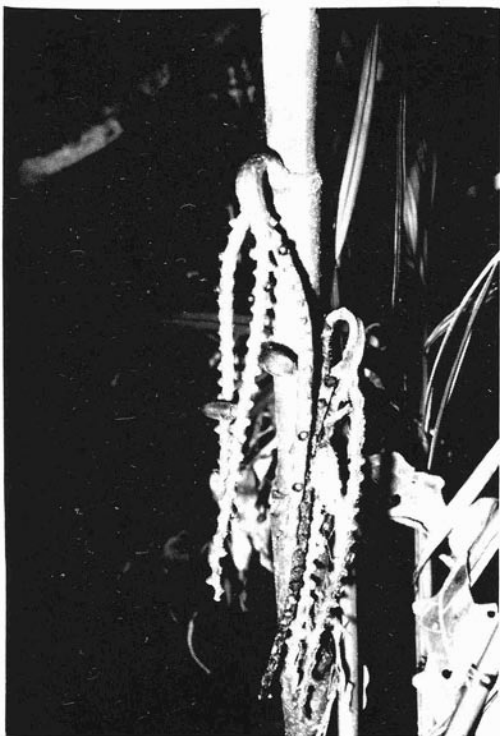


Fig. 17 *Pinanga badia*, inflorescence, Hodel et al. 1671 (holotype).



Fig. 18 *Pinanga fractiflexa*, habit, between Takuapa and Phanom, Hodel et al. 1729 (holotype).

and refers here to the scales of such color on the leaf sheaths.

***Pinanga fractiflexa* Hodel sp. nov. Fig. 18-20.**

Pinanga malaianae Becc. affinis sed foliis vaginis brunneolis luteis, rachillis valde fractiflexis, fructibus luteolis differt. Typus: Thailand, between Takuapa and Phanom, 600 m elev., D.R. Hodel, P. & R. Vatcharakorn 1729 (Holotypus BK).

Clustered understory palm to 5 m tall. Stems 3-5 cm diam., ringed, internodes 10-15 cm long, green with a few deciduous, brownish scales. Leaves 11, pinnate, ascending; sheaths 34 cm long, tubular, obliquely long-open apically, forming a crownshaft, greenish yellow with deciduous, smooth, reddish brown, stellate hairs 0.5 mm long, margins becoming shredded apically with small deciduous ocrea; petiole 70-100 cm long; rachis 1.8-2 m long; rachis and petiole with grayish brown scales; pinnae 8 on each side of rachis, 67-70 x 6-15 cm, falcate, acuminate, 3-6-nerved, end pair truncately praemorse. Inflorescences 2-3, infraxillary, 25 cm long; peduncle 2-3 cm long; prophyll 24 cm long, flattened, 2-winged, with deciduous, smooth, reddish brown, stellate hairs 0.5 mm long, other bracts not seen or reduced to small, lip-like ridges; rachis 3-5 cm long; rachillae 5, these 17 cm long, drooping, strongly zig zag. Flowers in triads of center, later-opening pistillate flanked on each of two sides of earlier-opening staminate, triads 4-5 mm distant within a row, 3-4 mm between rows, distichously arranged, subtended proximally by mucronate bracteole 1 mm high, several much smaller bracteoles also present around pistillate flower, staminate flowers subtended by low, lip-like bracteole. Staminate flowers 10-15 x 7-8 mm, angular, whitish to golden-yellow; calyx 4 x 6 mm, prominently lobed, sepals connate in basal 1 mm, spreading apically, acuminate; petals 15 x 6 mm, narrowly ovate, valvate, free to base, acuminate; stamens ca. 40, 4-5 mm high, filaments very short, 0.5 mm long, anthers 4 x 0.4 mm, dorsifixed toward base. Pistillate flowers 3.5 x 4-4.5 mm, globular, whitish; calyx and corolla similar, sepals and petals imbricate to apex, bowl-shaped, broadly rounded apically with incurved, briefly mucronate tips; pistil

2.5 mm high, ovoid, stigma with 3, short lobes. Fruits 3 x 1.5 cm, ovoid, brownish yellow when soft ripe; seeds 2 x 1 cm.

Pinanga fractiflexa occurs in wet hill forest on the west side of middle peninsular Thailand. It is similar to *P. malaiana* but the latter differs in its more or less straight rachillae, purplish black fruits, and leaf sheaths with brown, rough hairs 0.4 mm long. The epithet is from the Latin *fractiflexus*, meaning zigzag, and refers here to the rachillae.

***Rhapis siamensis* Hodel sp. nov. Fig. 21-23.**

Rhapis micranthae Becc affinis sed foliis laminis segmentis breviter basaliter connatis, floribus femineis anguste ovoideis, petalis anguste ovatis, calyce membranaceo differt. Typus: Thailand, Phattalung, 20 m elev., D.R. Hodel, P. & R. Vatcharakorn 1652 (Holotypus BK).

Clustered, dioecious, understory palm forming dense clumps 3-5 x 1-2 m. Stems often covered with persistent, fibrous sheaths, 6-15 mm diam. without sheaths, 1.8-2.5 cm diam. with sheaths, ringed, internodes 1-5 cm long, yellowish green. Leaves 15-22, spreading, palmately divided; sheath 5-12 cm long, long-open, margins fibrous-netted, fibers dark brown and in 3 layers, outermost coarsest, middle and innermost finer; petiole 30-50 cm long; blade 15-28 x 25-50 cm, +/- semi-orbicular, divided 3/4 to nearly to base into (5-)8-12 segments, these (12-)18-20(-24) x 0.5-5 cm, truncately praemorse, glossy green adaxially, paler abaxially, 1-4-nerved, 12-24 nerves total per blade, transverse veinlets conspicuous, close-set, 1-2 mm distant. Inflorescences 2-3, interfoliar, spreading; staminate 40 cm long, peduncle 20 cm long, flattened, 7 mm wide; prophyll 15 cm long, attached 9 cm above base of peduncle, tubular, obliquely open apically, thin-papery, reddish brown to brown with deciduous, twisted, slender, whitish hairs 2.5-4 mm long at apex and along both slightly winged margins, peduncular bract 1, similar to prophyll, 1-6 cm long, attached 7 cm above base of prophyll and extending on to rachis 3-4 cm; rachis 1-3 cm long with 2 main branches, one with bract similar to peduncular bract and inserted 1.5 cm above branch base; rachillae 13-28, these 10-15 cm long, lower ones sometimes furcate; pistillate