

coarsely toothed or scalloped, undulate, apical margins truncately praemorse, dark glossy green adaxially, paler abaxially, sparsely scattered simple or few-branched white hairs adaxially, abaxially a thin layer of olive-green indument and few scattered white hairs and patches of greenish yellow to white scales between and/or along nerves, up to 28 primary nerves on each side of rachis, these parallel, sigmoid, prominent and pale adaxially, pale to greenish abaxially, 10-12 secondary nerves between each pair of primaries, these +/- obscure adaxially, more conspicuous abaxially, sometimes long brownish scale-like hairs along nerves abaxially. Inflorescences inter- or infrafoliar in flower, infrafoliar in fruit, to 25 cm long, spreading, few-branched; peduncle to 12 cm long, with dense thick brownish indument; 2 bracts seen, these similar, to 7 cm long, green becoming brown, with similar indument as stem and sheath, lowermost bicarinate, both flattened, bifid and acute apically, uppermost exerted 3 cm above lower one and extending onto rachis; rachis 5 mm long, with similar indument as peduncle; rachillae (2-)3, to 15 cm long, 2 mm diam., 4-sided, stiff, lower 2 spreading at 180°, center one at 90° to lower ones, forming an inverted "T", densely and thickly covered with similar indument as peduncle. Flowers in triads of a center later-opening pistillate one flanked on each of 2 sides by earlier-opening staminate ones, triads spirally arranged, 4-8 mm apart, slightly sunken, subtended distally by a +/- thick lip-like bracteole to 0.75 mm high, subtended proximally by a +/- thin, knife-like bracteole to 1.5-1.75 mm high, both triad bracteoles with similar indument as peduncle. Staminate flowers seen in young bud, 1 mm high, ovoid-globose, white; calyx 0.3 mm high, brown, 3-lobed, sepals imbricate. Pistillate flowers subtended by 2-3 floral bracteoles, these imbricate, sepal-like broadly rounded, to 2.25 mm high, another bracteole subtending pistillate flower and one adjacent staminate flower, all bracteoles variously covered with reddish brown indument and nerved when dry, second staminate flower lacking a bracteole; pistillate flowers 5 x 4 mm, ovoid, white; calyx 2.75-3 mm high, shallowly lobed, sepals imbricate nearly to apex, clam-shell-like, broadly rounded, nerved when dry, margins

thinner; corolla 4.5 mm high, lobed, petals imbricate nearly to apex, boat-shaped, margins membranous, minutely fringed, free incurved mucronate acute tips, nerved when dry; staminodes 6, 5 of them situated within 2 petals and with a common base, to 2.25 mm long, 1 situated on opposite side of pistil, to 0.75 mm long, all slender, flattened; pistil 5 x 2.5 mm, +/- equalling petals, set on a 0.75 mm high stalk, ovary obovoid-globose, 3 mm high, style 2 x 0.75-1 mm, truncate apically, stigma lobes blunt, not much differentiated.

The specific epithet is from the Latin *speciosus*, meaning showy or splendid, and is used here in reference to the unusual and striking beauty of this species. *Iguanura speciosa* is exceedingly handsome, and is a spectacular ornamental in cultivation. It is closest to *I. polymorpha* but the latter differs in its inflorescences with more branches and lack of prominent ligules at the apex of the leaf sheath. Some students of palms may be inclined to include *I. speciosa* within a highly variable *I. polymorpha*. However, the two species grow sympatrically, although rather localized, in hill forest in southern peninsular Thailand, and the differences stated above between them remain constant. Also, at least in that part of Thailand, *I. speciosa* has simple leaf blades while those of *I. polymorpha* are pinnate.

Licuala aurantiaca Hodel sp. nov. Fig. 4.

Subgeneris *Eulicualae* Drude, sectioni *Wurmbiae* Furtado. *L. malajanae* Becc. affinis sed foliis petiolis et vaginis aurantiacis, segmentis paucioribus nervis numerioribus; inflorescentiis rachillis numerioribus; fructibus minoribus; perianthiis fructificantibus lobis longis acutis differt. *L. paludosae* Griff. affinis sed foliis petiolis et vaginis aurantiacis, inflorescentiis pilis non stellaribus differt. Typus: Thailand, S of Narathiwat, 25 m elev., D.R. Hodel, P. & R. *Vatcharakorn 1581* (Holotypus BK).

Clustering and/or gregarious understory palm to 8 m tall, forming clumps to 6 m wide. Stems 10-12 cm diam. with leaf sheaths, narrower without. Leaves ca. 10 per stem, palmately divided, spreading; sheath 15-20 cm long, long-

open, tubular only at base, with +/- thick dark brown coarse horizontal fibers along margins, newer leaves with long-acuminate reddish brown ligules to 15 cm long at sheath apex; petiole to 3 m long, lateral margins in basal 2/3-3/4 of petiole armed with stubby curved thorns to 2-5 mm long; sheath and petiole strikingly bright orange and with reddish brown indument; blade to 1 m wide, nearly orbicular, divided to base into 8-11 segments except middle 2 segments confluent in basal 15 cm, segments to 50 x 14 cm, lower segments obliquely praemorse apically, segments becoming progressively more truncately praemorse toward middle of blade, up to 5-nerved, apex with 2-3 cm long lobes bifid for 5-10 mm. Inflorescences to 2 m long, ascending then spreading, shorter than to slightly exceeding leaves; peduncle 50 cm long, 2-3 cm wide, flattened; distal half of inflorescence bearing 6 partial inflorescences each subtended by its own bract, these subinflated, reaching just to base of next distal partial inflorescence, partial inflorescences decreasing in size and complexity distally on inflorescence, bearing up to 6 digitately

arranged rachillae; rachillae to 19 cm long, spreading, bearing +/- dense deciduous indument. Flowers not seen. Fruits spirally arranged, sometimes 2-3 in a group especially in basal portions of rachillae, 8 x 6 mm, obovoid, wine-red, held on short pedicellate stalk; seed 6 x 4 mm, globose-obovoid; fruiting perianth 2 x 3 mm, cupular to urn-shaped, calyx and corolla deeply lobed, lobes long-acute, flaring against basal portion of fruit.

The specific epithet is from the Latin *aurantiacus*, meaning orange, and is used here in reference to the attractive, striking bright orange leaf sheaths and petioles, which make *Licuala aurantiaca* a handsome ornamental. *L. aurantiaca* is closest to *L. malajana* but the latter differs in its green to brown leaf sheaths and petioles, more numerous segments with fewer nerves, inflorescence with fewer rachillae, larger fruits, and fruiting perianth with rounded, short lobes. *L. aurantiaca* has been confused with *L. paludosa* since they grow in similar habitats, swampy forests; however, *L. paludosa* differs in its pale



Fig. 4 *Licuala aurantiaca*, habit, Hodel et al. 1981 (holotype).



Fig. 5 *Licuala filiformis*, habit, Hodel et al. 1621 (holotype).

greenish brown petioles, and inflorescence bracts, rachis, and rachillae with stellate brown hairs. *L. paludosa* inhabits coastal swamp forest from Indo-China through the Malay Peninsula (including peninsular Thailand) to Sumatra and Borneo, while *L. aurantiaca* occurs in peat swamp forest farther inland from the sea at low elevations on the east coast of southern peninsular Thailand. It is remarkable that a species with such dramatic and ornamental coloring went unnoticed for so long.

***Licuala filiformis* Hodel sp. nov.** Fig. 5.

Subgeneris *Eulicualae* Drude, sectioni *Wurmbiae* Furtado. *L. triphyllae* Griff. affinis sed inflorescentiis rachillis filiformibus valde fractiflexis; floribus late ovatis differt. Typus: Thailand, S of Narathiwat, 100 m elev., D.R. Hodel, P. & R. Vatcharakorn 1621 (Holotypus BK).

Solitary, dwarf, gregarious, acaulescent understory palmlet to 80 cm overall height but usually much shorter. Stem short, bulbous, subterranean, 3-5 cm diam. Leaves 5-10, palmately divided, spreading, arising from ground; petiole 15-45(-75) cm long, lateral margins in basal 2/3 of petiole armed with thorns to 8 mm long, these forward-curving, irregularly spaced; blade 25-30 cm wide, semi-orbicular, divided to base into 3-7 segments, middle one largest, to 30 x 12 cm and held on its own 4 cm long subpetiole, 11-17-nerved, apex only slightly rounded, truncately praemorse, shallowly toothed, other segments decreasing in size toward petiole, these 14-28 x 1.75-5 cm, widest at apex, 2-6-nerved, obliquely praemorse, more prominently toothed. Inflorescences shorter than leaves, arising from ground, to 25 cm long, spreading; peduncle to 20 cm long; bracts 2, these with deciduous rusty brown felt-like indument; 2-4 partial inflorescences spaced 2-6 cm apart in apical portion of inflorescence, each partial inflorescence with its own subtending bract, these tubular, apically subinflated, with glaucous indument, each partial inflorescence bearing 1-3 rachillae, these 2-6 cm long, digitately arranged, slender, filiform strongly zigzag, densely covered with reddish brown scurfy indument. Flowers remote, at the

"elbows" of the zigzag rachillae, 3-8 mm apart, distichously arranged, solitary, sessile or on a small pedicel but not stalked, subtended by triangular bracteole to 1 mm long, flowers 2.5 x 1.5 mm, broadly ovate; calyx 1.5 mm high, deeply lobed apically, truncate basally, sepals connate in basal 2/3, acute apically, green but with same indument as rachillae; corolla 2-2.5 x 1.25-1.5 mm, white, deeply lobed, petals connate in basal 2/3, acuminate apically, densely covered with white hairs; staminal ring just exceeding corolla throat, stamens 6, incurved toward pistil, filaments 0.3 mm long, slender, anthers 0.3 mm long, oval; pistil 1.75 x 1-1.25 mm, spindle-shaped, base and truncately sculptured top densely covered with white hairs, style 0.75 mm long, slender, equalling stamens. Fruits 8 x 6 mm, ovoid-globose, reddish, bearing a beak at proximal end, fruiting perianth 3 x 2.75 mm, calyx 2 mm high, deeply lobed, lobes spreading, acute, with felt-like indument, corolla 3 mm high, deeply lobed, lobes spreading against base of fruit, acuminate; seed 6 x 4 mm

The specific epithet means thread-like and is used here in reference to the rachillae of *Licuala filiformis*. The thread-like, strongly zig-zag rachillae are a diagnostic character for this species, and one which distinguishes it from the similar *L. triphylla*. *L. filiformis* occurs in disturbed forest on flat sandy soils in southern peninsular Thailand. It should be considered endangered since its habitat is under cultivation in proximity to extensive human activity.

***Licuala poonsakii* Hodel sp. nov.** Figs. 6 & 7.

Subgeneris *Eulicualae* Drude, sectioni *Wurmbiae* Furtado. *L. acutifidae* Becc. affinis sed habitu grandioribus; foliis segmentis grandioribus nervis numerioribus; inflorescentiis longioribus rachillis numerioribus; floribus longis-ovatis, petalis longioribus, ovario truncato stylo longissimo differt. Typus: Thailand, Rayong, 600 m elev., D.R. Hodel, P. & R. Vatcharakorn 1570 (Holotypus BK).

Solitary or clustered and/or gregarious understory palm to 6 m tall, if forming clumps then usually of 1 tall plant and several small ones at base. Stem 3-5 cm diam. without sheaths and