Zeitschrift: Candollea : journal international de botanique systématique = international journal of systematic botany

Herausgeber: Conservatoire et Jardin botaniques de la Ville de Genève

Band: 20 (1965)

Artikel: The genus Taveunia, Palmae-Arecoideae-Clinostigmeae

Autor: Moore, Harold E.

DOI: https://doi.org/10.5169/seals-880358

Candollea 20 : 91-102. 1965.

The genus Taveunia, Palmae-Arecoideae-Clinostigmeae [1]

HAROLD E. MOORE, JR.
L. H. Bailey Hortorium, Cornell University, Ithaca, New York

The genus *Taveunia* was established by BURRET to include a single species, *T. trichospadix*, based on flowering material in the Berlin herbarium collected on the island of Taveuni by *C. Weber (no. 112)* in 1881. Collections made in the Fiji Islands during 1964 now provide information to correct and to complete BURRET's generic description, to describe a second species as *Taveunia tanga*, and to propose a relationship quite different from the affinity with *Actinokentia* suggested earlier by BURRET.

Although the type is no longer available and no duplicate material has been located, the material at hand is in excellent general agreement with BURRET's description and was collected on Taveuni, though at a considerably higher elevation than was apparently indicated by WEBER. According to BURRET: *The species is said to be widely distributed in the hills of Taveuni, generally below 300 meters.* Nowhere on Taveuni was *Taveunia trichospadix* found so low. It was found, however, at an altitude of about 600 meters on the trail from Somosomo to the crater lake in the center of the island, and again on the island of Vanua Levu at a similar altitude.

Examination of recent specimens also suggests that BURRET's description of floral distribution is in error. A single staminate flower and a single pistillate flower were said to be juxtaposed at lower flowering nodes of the ultimate inflorescence axes, while apically the staminate flowers were said to be solitary. This may often appear true on gross examination, for one staminate flower usually falls before the other, but in reality, the flowering nodes are composed basically of triads of two staminate and a pistillate flower (or nodes of two or one staminate flowers through successive abortion apically) as evidenced by floral scars, just as in the majority of other arecoid palms. Essentially mature fruit is described for the first time in the following emended description.

[1] The assistance of the National Science Foundation under Grant GB-1354 is gratefully acknowledged as is the generosity of the Department of Agriculture, Fiji Islands, through the Director and Mr. JOHN PARHAM, in providing the assistance of Mr. DOMINIKO-KOROIVEIBAU during part of April, 1964, and many other courtesies.

Taveunia Burret, Bernice P. Bishop Museum, Occ. Papers **11** (4): 12. 1935.

Solitary, small to moderate, unarmed, monoecious palms lacking stilt roots, the trunk slender, prominently and irregularly ringed. *Leaves* 7-10 in an ascending-spreading crown, the sheaths open abaxially, not forming a crownshaft; petiole prominent; blade reduplicately pinnate or pinnately nerved, the pinnae acute to acuminate or at length sometimes bifid, or the blade nearly undivided laterally, the pinnae or lateral segments prominently nerved with the midnerve and secondary nerves keeled above. *Inflorescence* paniculate, long-pedunculate, subtended by 2 thin bracts, the lower ancipitous, inserted near the base of and incompletely encircling the peduncle, congenitally open abaxially, the upper inserted at some distance above the lower, elongate, terete, rostrate, enclosing the inflorescence in bud, splitting abaxially and at length marcescent and fibrous; peduncle somewhat dorso-ventrally compressed; rachis elongate, the lower branches with elongate peduncular bases and twice-branched in part, the upper branches simply branched to unbranched; flowers borne in triads of two staminate and a central pistillate on the lower one-third to one-half of the ultimate axes, the staminate paired to solitary by abortion above, the triads subtended by a prominent, spreading-ascending, more or less rounded bractlet and somewhat depressed in the angled axes: staminate flowers small, one subtended by a single bracteole, the other ebracteolate, borne on very short flattened pedicels at least in lower triads, slightly asymmetric, the 3 sepals broadly imbricate, keeled dorsally to a gibbous base, one usually smaller than the others, the 3 petals navicular, valvate, about twice as long as the sepals or slightly more, acutish, one slightly larger than the others, stamens 6, the distinct filaments elongate, subulate, inflexed at the apex, the versatile anthers linear-oblong in outline, dorsifixed, divided basally nearly to their insertion, truncate or slightly emarginate apically, pistillode columnar and grooved with slightly expanded subcapitate apex at least when dry, nearly as long as the stamens in bud: pistillate flowers subtended by 2 sepallike bracteoles, the 3 sepals broadly imbricate, rounded, petals 3, convolute-imbricate, briefly but prominently valvate apically, staminodes 3, dentiform, pistil ovoid with 3 short recurved stigmas, unilocular, uniovulate, the ovule campylotropous, pendulous from near the apex of the axile surface of the locule. *Fruit* oblong-ellipsoid with excentrically apical or subapical stigmatic remains, the exocarp smooth but drying granular over abundant short sclerosomes in the slightly fleshy mesocarp which also contains flat anastamosing fibers next to the endocarp, this sculptured about the apex in conformity with the seed, thin, crustaceous, fragile, glossy within and not adherent to the seed, operculate over the hilum and embryo: seed sharply angled and sculptured apically and laterally, with a prominent rounded keel extending nearly the length of the seed opposite the hilum; the hilum elongate, extending nearly to the basal embryo; branches of the raphe simple or again slightly branched and radiate; endosperm homogeneous. Chromosome complement: n = **16** (READ, R. W. Principes **9**: 10. 1965).

TYPE SPECIES: *T. trichospadix* Burret.

Taveunia is quite distinct from other arecoid genera of Fiji in at least one respect. It is the only genus in which the inflorescence is interfoliar and long-pedunculate and the subtending bracts very strongly disparate in length and shape. The lower bract is flattened, markedly ancipitous marginally, does not completely encircle the base of the peduncle, and is congenitally open abaxially, a characteristic noted among several genera of the Clinostigmeae. The elongate terete inner bract is very much like that of *Heterospathe*, which *Taveunia* resembles also in general inflorescence structure, in flowers, and to a large extent in fruit except the endocarp and seed. In fact, lacking fruits with mature seeds, I had tentatively labelled specimens of both

species of *Taveunia* as *Heterospathe* in the herbarium. Superficially the two genera are very similar, even to the elevated and markedly decurrent midnerves of pinnae toward the apex of the leaf.

Despite these similarities, the irregular seed, congenitally incomplete lower bract of the inflorescence, and the thin, fragile, crustaceous endocarp with a well defined operculum along the hilum and over the basal embryo mark *Taveunia* as a member of the Clinostigmeae. This is an Old World tribe of the Arecoideae principally austral in distribution, with a predominance of genera in New Caledonia. *Taveunia* is, in respect to the elongate interfoliar inflorescence, a Fijian counterpart of the New Caledonian *Brongniartikentia*, which similarly is the only genus on the latter island with this type of inflorescence. *Brongniartikentia* will not be confused with *Taveunia*, however, because of the didymous stamens and the fruit with basal or subbasal stigmatic residue. *Heterospathe* is distinguished from *Taveunia* by the often thickened marginal nerves of the pinnae, by the complete lower bract of the inflorescence which encircles the base of the peduncle, by the usually thick and caducous upper bract of the inflorescence, by the rounded endocarp and seeds, the non-operculate endocarp, and the ruminate endosperm.

Key to the Species of *Taveunia*

1a. Leaf uniformly divided into 20-28, mostly prominently 3-nerved, acute to acuminate or at length bifid pinnae, the nerves lacking linear scales on the upper surface; fruit ca. 2 cm long when fresh, drying 16-18 mm long. Vanua Levu, Taveuni. *T. trichospadix*

b. Leaf undivided except the bifurcate apex, or irregularly divided toward the apex with few unequal and scarcely disjunct segments, elongate-cuneate in outline, the principal nerves with linear scales above; fruit ca. 13 mm long when fresh and not completely mature, Viti Levu . . . . . *T. tanga*

Taveunia trichospadix Burret, Bernice P. Bishop Museum, Occ. Papers **11** (4): 13. 1935. (See fig. 1, 2, 3, 4.)

Trunk to 6-7 m high, ca. 8.5 cm in diam. with closely, prominently and irregularly ringed trunk, this bright green in new growth becoming brown in age. *Leaves* 7-10 in an ascending-spreading crown; sheaths ca. 27.5 cm long, green, sometimes with yellowish base, and densely covered when young by tawny floccose-tomentose scales, these persistent near the junction of sheath and petiole and along the adaxial surface, abaxially deciduous, leaving only short subulate bases on surfaces near the margins; petiole 3.5-5 dm long, green, deeply concave above, with broad thin margins in lower part, becoming only slightly less concave upward but with narrower margins, rounded below, densely to somewhat sparsely lepidote with very small floccose-tomentose to fimbriate-membranous brown deciduous scales becoming merely brown-puncticulate in age; rachis 1.15-1.3 m long, rounded and brown-puncticulate below, deeply concave above near the base and margined with grooved flanges, becoming progressively flatter toward the middle of the leaf and nearly deltoid in section near the apex, sparsely lepidote to fimbriate-membranous scaly medially; pinnae 20-28 on each side, slightly falcate, not conspicuously reduplicate basally, acute to acuminate or tending to become briefly bifid apically or the apical pair sharply lacerate, inserted in the grooves of flanges below, on the angles of the rachis above, prominently 3-nerved except

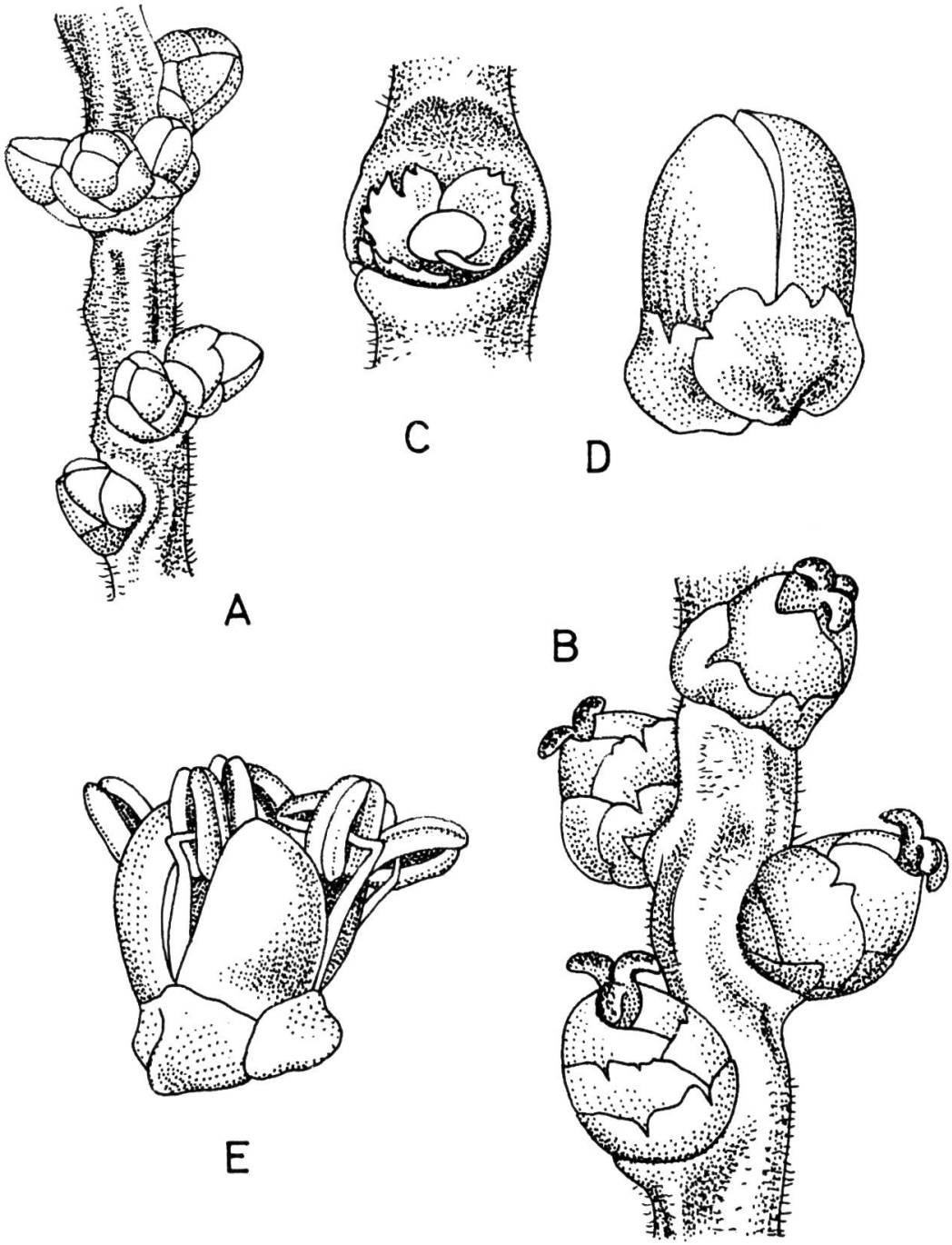

FIG. 1. *Taveunia trichospadix* Burret

a, portion of flowering axis with triad (upper center) and triad with one staminate flower fallen (lower center) × 1; *b*, portion of flowering axis at pistillate anthesis × 2; *c*, flowering node with flowers removed to show sepal-like bracteoles and scars of pistillate and one staminate flower, second staminate scar concealed at right × 2; *d*, staminate bud × 4; *e*, staminate flower at anthesis × 4 (*a*, *c*, *d*, from *Moore & Koroiveibau 9354; b*, *e*, from *Moore & Koroiveibau 9345*).

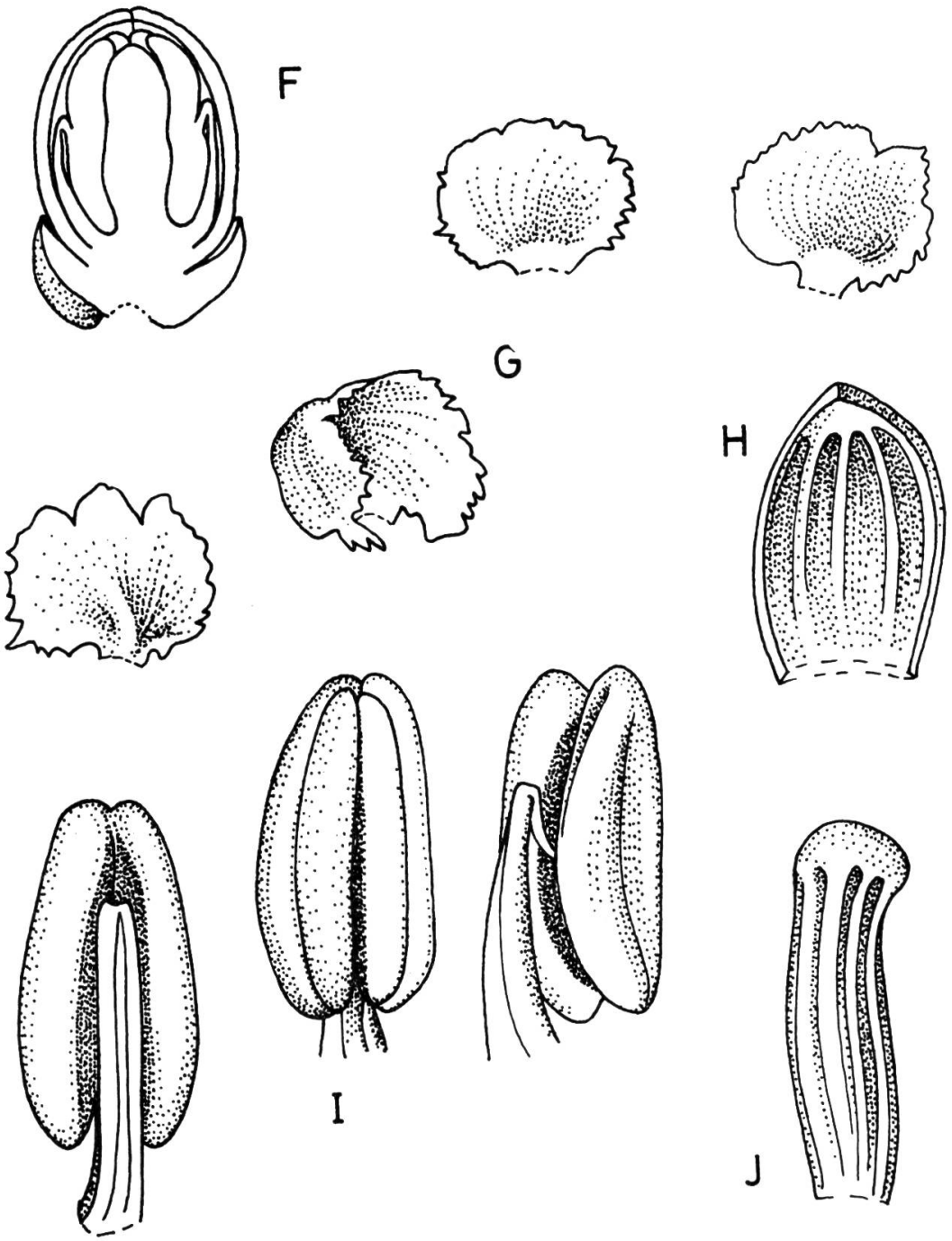

FIG. 2. *Taveunia trichospadix* Burret

f, staminate bud in vertical section × 4; *g*, staminate sepals × 4; *h*, staminate petal × 4; *i*, stamens in adaxial, abaxial and lateral views × 8; *j*, pistillode × 8 (from *Moore & Koroiveibau 9354*).

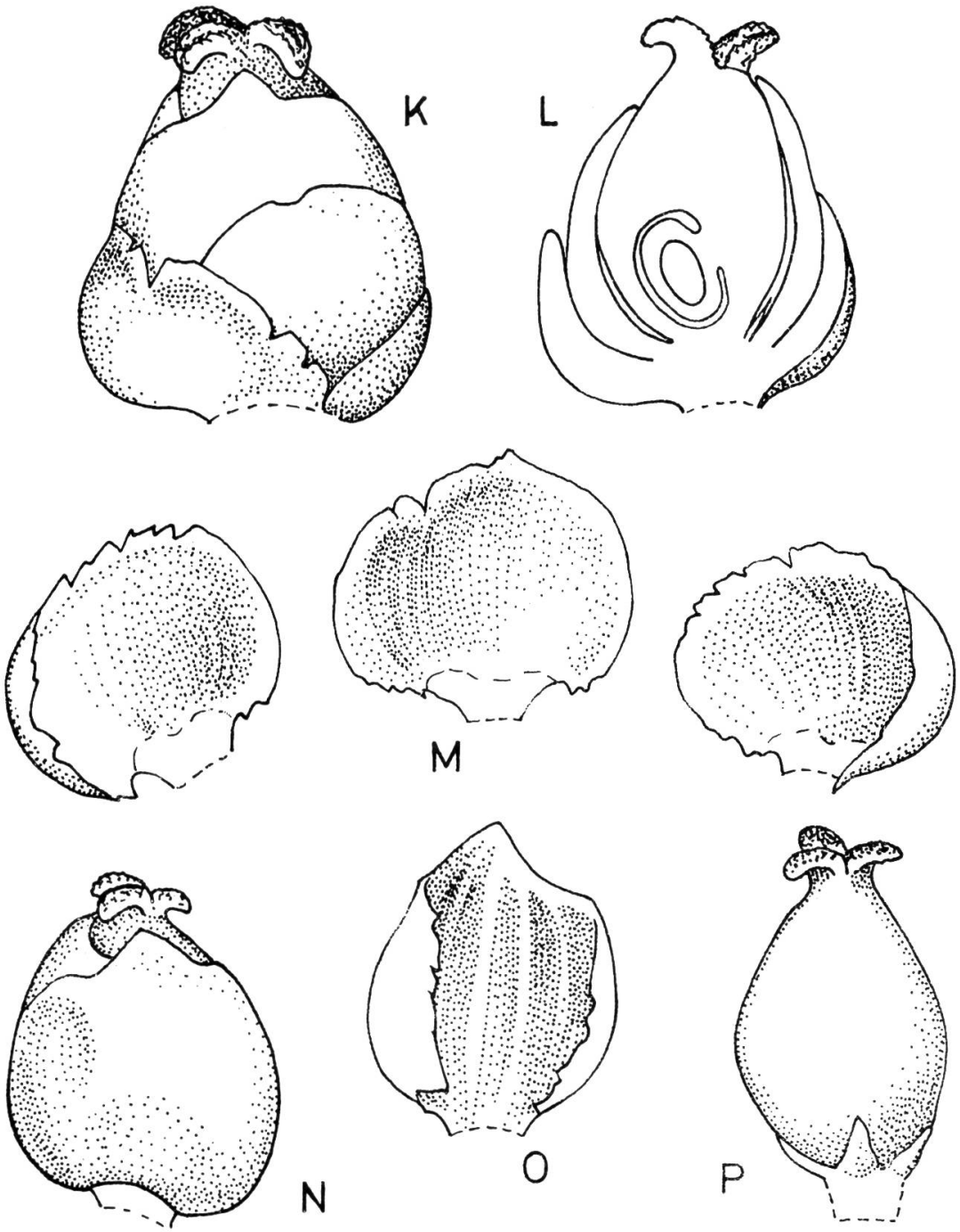

FIG. 3. *Taveunia trichospadix* Burret

k, pistillate flower × 4; *l*, pistillate flower in vertical section × 4; *m*, pistillate sepals × 4; *n*, pistillate flower with sepals removed × 4; *o*, pistillate petal × 4; *p*, pistil with staminodes × 4 (from *Moore & Koroiveibau 9345*).

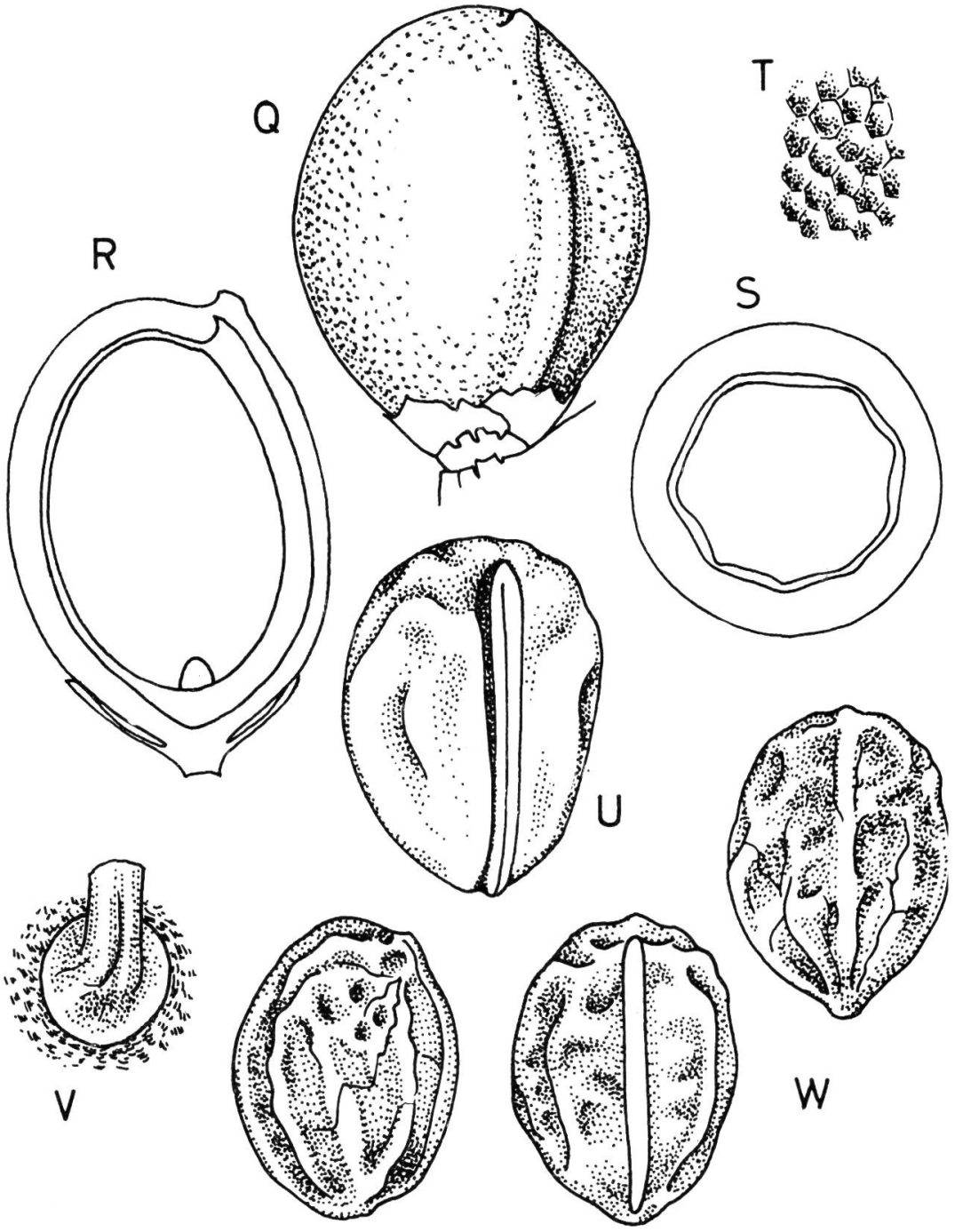

FIG. 4. *Taveunia trichospadix* Burret

q, fruit × 1; *r*, fruit in vertical section × 1; *s*, fruit in cross-section × 1; *t*, surface of dry fruit much enlarged; *u*, endocarp and operculate region × 1; *v*, operculum over embryo much enlarged; *w*, seed in lateral, adaxial, and abaxial views × 1 (from *Moore & Koroiveibau 9354*).

the basal and apical, these sometimes 5-6-nerved, the midnerve and a lateral nerve halfway to the margin on each side elevated and pale above, with about 3 intervening tertiary nerves, all the nerves less prominent and densely brown-puncticulate below, the midnerve with linear fimbriate brown membranous scales to 3 mm long below, the lowermost pinnae 1.2-3.5 cm wide along the rachis, 2.5-4.7 cm wide in the middle, 40-60 cm long, median segments 2-2.5 cm wide along the rachis, 2.7-3.1 cm wide at the middle, 55-62.5 cm long, apical segments 4-15 cm wide along the rachis, 2-8.5 cm wide at the middle, 17-38 cm long. *Inflorescences* 0.9-1.5 m long, the lower bract 27-32 cm long, to 2.5 cm wide, floccose-tomentose abaxially and adaxially but not marginally when young, upper bract inserted 4.5-5 cm above the lower floccose-tomentose when young but at length merely brown-puncticulate; rachis nearly as long as the peduncle, brown-puncticulate or with minute brown fimbriate-membranous scales, bearing ca. 13 branches, the lowest ca. 5-6 dm long including a peduncular base 3 dm long, all the axes more or less angled, either brown-puncticulate or the ultimate to ca. 30 cm long and rather densely covered with brown-white fimbriate-tufted scales among the flowers; bractlets subtending the triads rounded and prominent: staminate flowers ebracteolate or subtended by a prominent centrally ciliate bracteole, ca. 3 mm high, greenish with white stamens and pistillode, the sepals 1.5-1.6 mm high and wide, petals 2.4-2.5 mm high, 1.6 mm wide: pistillate flowers ca. 3 mm high, greenish with white pistil and recurved stigmas, sepals ca. 2.2 mm high, petals ca. 2.8 mm high. *Fruit* oblong-ellipsoid, smooth, greenish to brownish (?) and ca. 2.0 cm long, 1.4 cm in diam. when fresh, drying granular and ca. 1.6-1.8 cm long, 1.1-1.2 cm in diam.: seed dark brown, ca. 1 cm long, 6 mm in diam. Chromosome complement: n = **16**.

DISTRIBUTION: FIJI ISLANDS. Taveuni: by streamlet and trailsides on steep slopes below crest of mountain on trail from Somosomo to crater lake, 23 April 1964, *H. E. Moore, Jr. & D. Koroiveibau 9354* (BH, SUVA). Vanua Levu: in rain forest on steep upper slopes and ridges of Mt. Mariko on trail from Bucalevu Village to summit, alt. ca. 600 m, 17 April 1964, *H. E. Moore, Jr. & D. Koroiveibau 9345* (BH, SUVA); rain forest on slopes of Drayton Peak (Mt. Mariko) on trail between Mbiaunqunu and Korosi, about 15 miles from Savu-Savu, alt. 2,000 to 2,500 ft., 15 March 1962, *D. W. Bierhorst F-130* (BH).

OBSERVATIONS: *Taveunia trichospadix*, where collected personally, occurred in general association with *Goniosperma thurstonii* and *Clinostigma exorrhiza*, two other clinostigmoid palms. It is readily distinguished from these, even when sterile, by the lack of stilt roots and by the abaxially split leaf-sheaths.

Taveunia tanga H. E. Moore, spec. nov. (See fig. 5, 6, 7.)

Ab *T. trichospadice* differt foliis elongato-cuneatis indivisis vel irregulariter divisis, nervis supra lepidibus linearibus lepidotis, fructibus ca. 13 mm longis.

Trunk to ca. 5 m high, 1-2 dm in diam. (but trees flowering when only 1.55-2 m high), green-brown, roughly, prominently and irregularly ringed, with old leaf bases often persistent. *Leaves* ca. 10 or fewer, ascending, stiff, elongate-cuneate and undivided except the bifid apex or irregularly divided toward the apex; sheath green with orangish-yellow base outside, yellow inside, ca. 48 cm long, glabrous in age but covered when young with deciduous white to tawny floccose-tomentose or matted scales; petiole ca. 28 cm long, rounded below, deeply concave above, covered when young with loose whitish-floccose-tomentose scales becoming merely pale-puncticulate in age; rachis ca. 2.6 m long, puncticulate and rounded below, channelled to deltoid above; blade green, ca. 6 dm broad at middle, undivided for a

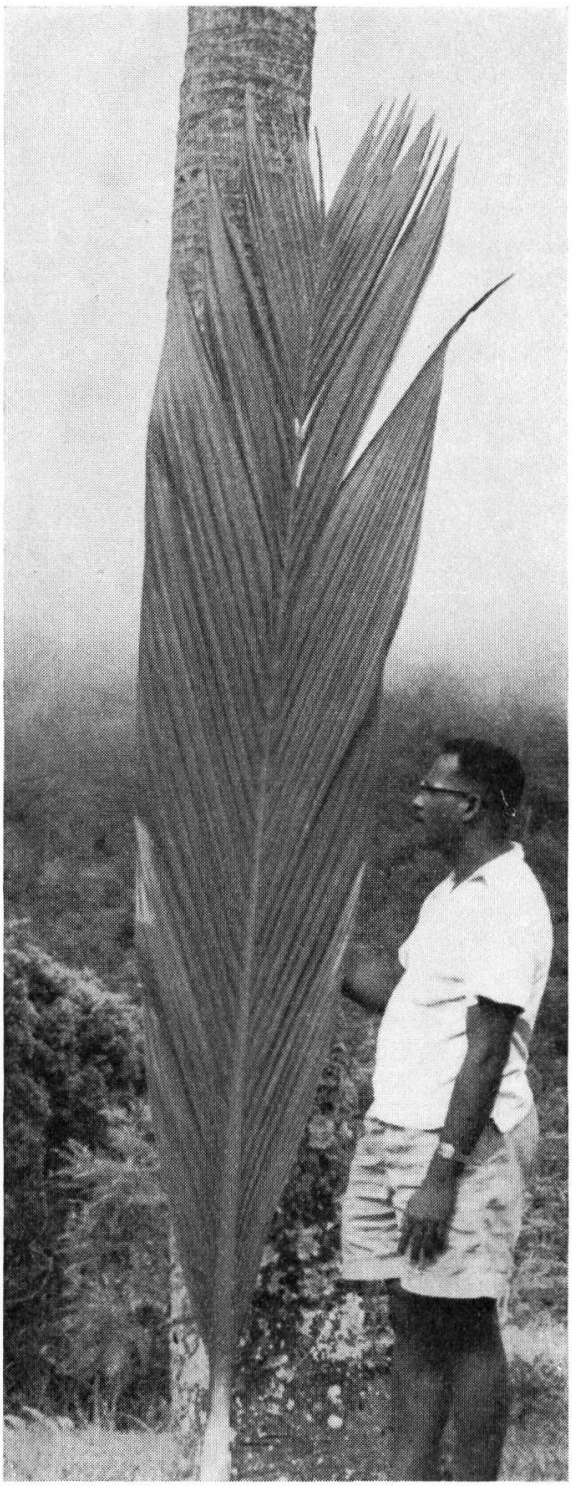

FIG. 5. *Taveunia tanga* Moore

Leaf held by D. Koroiveibau. *Moore & Koroiveibau 9364.*

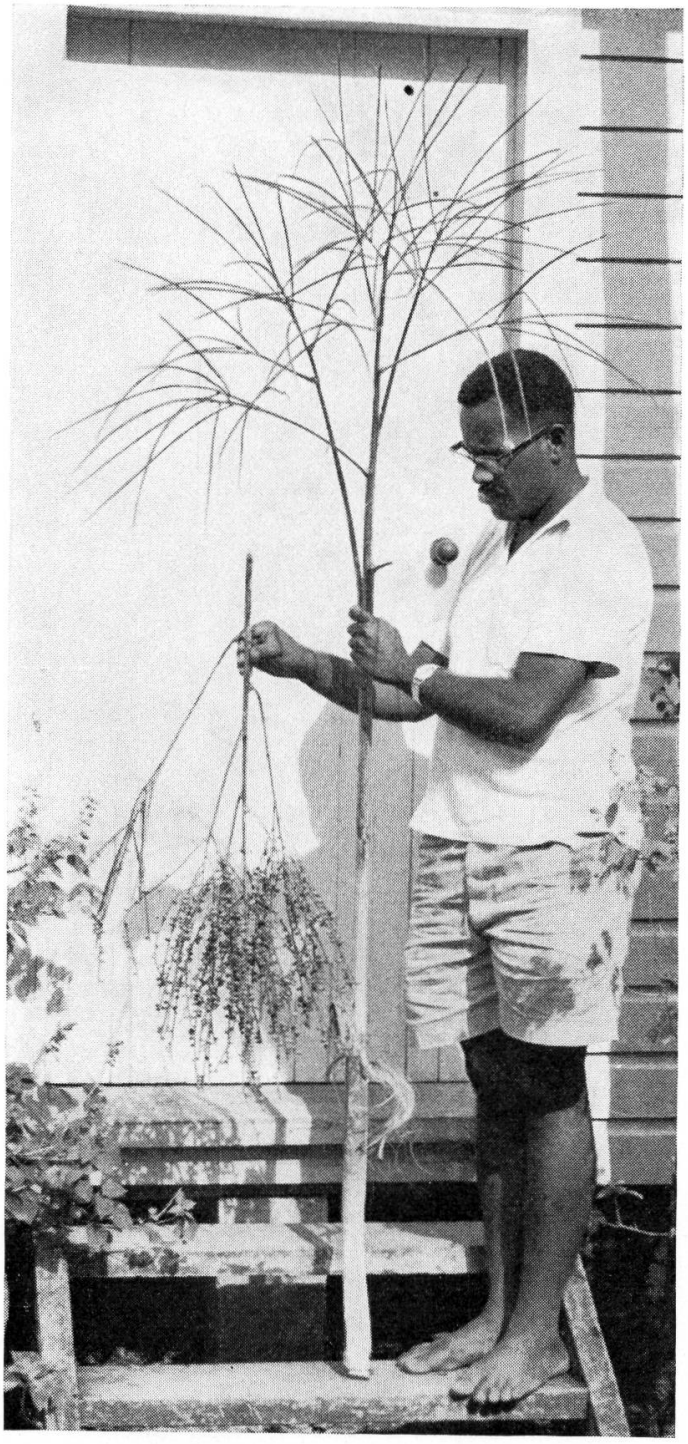

FIG. 6. *Taveunia tanga* Moore

Inflorescence in bud and part of fruiting inflorescence. *Moore & Koroiveibau 9364.*

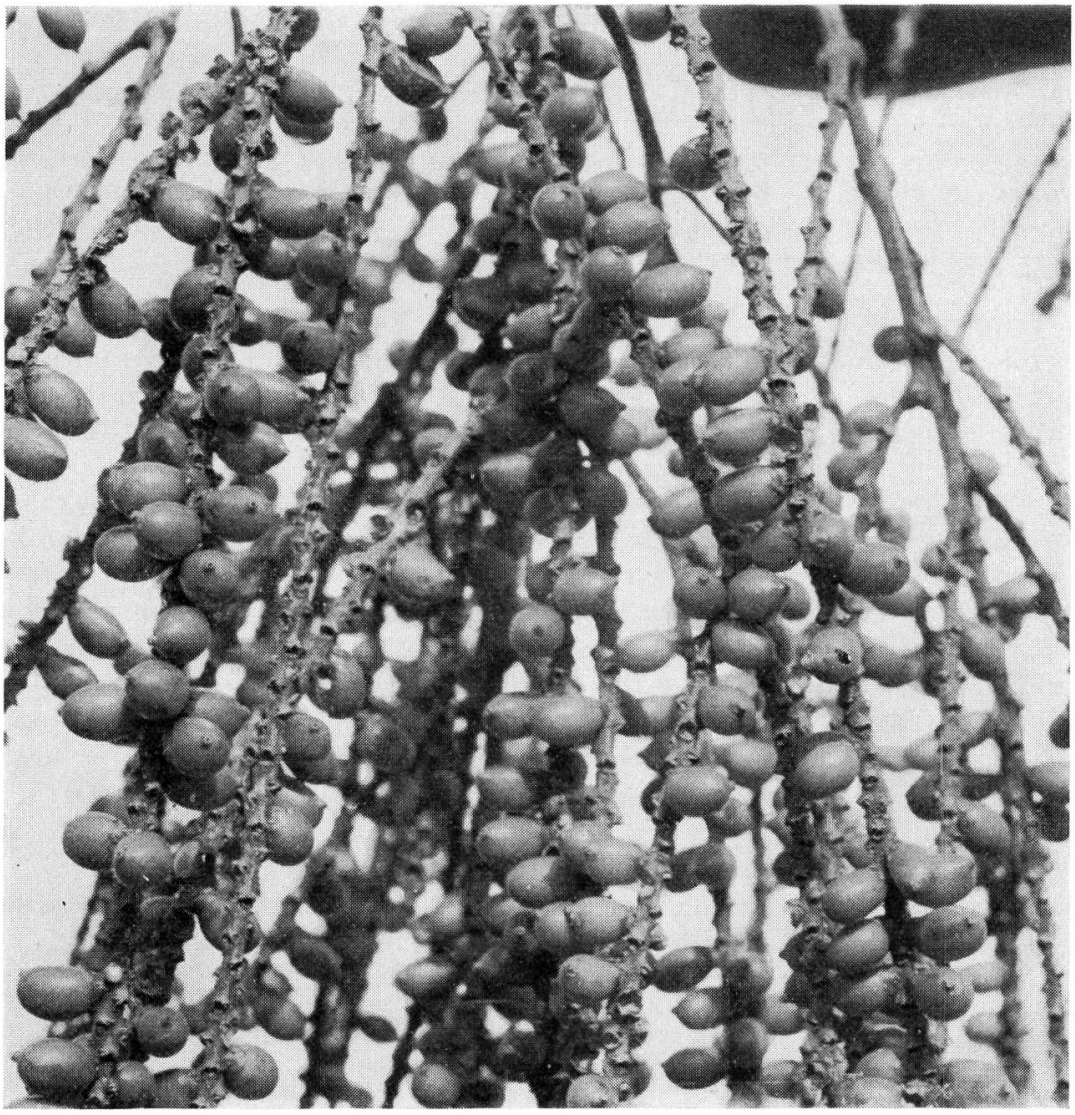

FIG. 7. *Taveunia tanga* Moore

Portion of inflorescence with immature fruit. *Moore & Koroiveibau 9364.*

length of ca. 1.55 m with undulate margins and linear pale scurfy scales on the 25 primary nerves above, then irregularly divided into ca. 4 segments with 1-3 primary nerves and an apical 12-nerved segment on each side, similarly scaly, duller green with pale appressed scales on some primary nerves below, all the nerves very densely and minutely brown-lepidote. *Inflorescence* green with indument of light-brown matted floccose scales on the major axes merging into loose red-brown fimbriate-tufted scales among triads on ultimate axes; peduncle ca. 1.2 m long; rachis ca. 83 cm long with ca. 8 major branches, the lowermost with a peduncular base ca. 47 cm long and rachis ca. 23 cm long with 8 furcate to simple axes to 30 cm long; lower bract not seen; upper bract inserted ca. 7 cm above the lower, densely brown-tomentose, more than 6 dm long and frayed at the tip: staminate flowers ca. 2.2 mm long but probably not completely mature, the sepals ca. 1.5 mm high with dark brown margins, petals greenish when dry, not twice as long as the sepals; pistillate flowers about as large as the staminate in bud, the sepals 2.4 mm long, petals 3 mm long in fruit. *Fruit* said to be greenish-yellow when ripe, ca. 1.3 cm long, 8 mm in diam. but perhaps not completely mature; seed ca. 9 mm long, 6 mm in diam., sharply angled and sculptured.

DISTRIBUTION: FIJI ISLANDS. Viti Levu: Ra Province; fairly abundant among rocks in forest along Vuniatambua Creek between Dromoromo and Vuniatambua ridge, 4 May 1964, *H. E. Moore, Jr. & D. Koroiveibau 9364* (BH, holotype; SUVA, isotype); in forest, Vuniatambua, Navai, 21 March 1941, *O. Degener 14793* (BH).

OBSERVATIONS: Some years ago, specimens of this species were collected by *Otto Degener* and forwarded to the Bailey Hortorium for study. The extraordinary leaves denoted a species new to Fiji but the few immature fruits and incomplete inflorescence were insufficient for adequate generic disposition. Collection of an adequate series of this species was a prime objective during field work in the Old World tropics in 1963-64. That *Taveunia tanga* can now be described is due to the efforts of Mr. KOROIVEIBAU who, on a second attempt to reach the locality specified by DEGENER, was successful in obtaining a nearly complete series on the very last day of field work while the writer was incapacitated and restricted to nearby Nadarivatu by a severe leg infection. Thus it is with considerable satisfaction that both the genus *Taveunia* and an undescribed species can be elaborated.

The epithet for this species is taken from the phonetic spelling of the vernacular name, *Tanga* (Taga). Both seed and bud (heart) are said to be edible.