

NEW POLYNESIAN PLANTS

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PANDANACEAE

FREYCINETIA Gaudichaud

Freycinetia victoriperrea Solms-Laub.¹

Freycinetia demissa R. Brown.

Leaves linear lanceolate, 60-80 cm. in length, up to 4 + cm. in width, somewhat dilated at the base, acuminate, spinulose-serrate along margin and keel in the apical portion of the blade; inflorescence terminal; spadices in fascicles of four, the carpellate ones with small bracts 2-3 cm. in length at the base, ovate-cylindrical, 7-9 cm. in length, on peduncles 5-6 cm. in length, 5 ± mm. in thickness, scabrid; fruits free, slightly fleshy, ovate, contracted into a conical beak with 6 ± stigmas at the end.

Tahiti, Vaheria, altitude 700 meters, June 3, 1927, L. H. MacDaniels, no. 1597, reference type.

Endemic in Tahiti. Native name: *ieic*.

PANDANUS Linnaeus

Pandanus pulposus Martelli.

Pandanus tectorius var. *pulposus* Warburg: Das Pflanzenreich, vol. 3, pt. 4, no. 9, p. 49, 1900.

Pandanus pulposus Martelli: Webbia, vol. 4, p. 409, fig. 39, 1914.
Original description amplified by Forest B. H. Brown:

Drupes broadly turbinate, tapering from the middle, strongly contracted at the base, 5-8 cm. long, 5-6 cm. wide, 5-6-sided, free in the upper half, convex at the apex; sutures prominent, with or without deep narrow furrows; carpels 7-12 in number, broad, irregular, the outer ones broadest, convex or convexo-pyramidal at the apex, angular, separated by deep narrow or obscure furrows; endocarp osseous, thick walled, rimose, situated above or mostly above the center of the drupe, dorsiventrally compressed, nearly as broad as the drupe, 3 ± cm. in axial thickness, irregularly convex above, flat or concave below; apical mesocarp chambers with rather thin lateral walls, transversed by coarse fibrovascular strands with intrafascicular pith and broad intrafascicular cavities; basal mesocarp abundant, fleshy, traversed by slender fibrous strands imbedded in thin walled, succulent parenchyma stored with starch and sugar; seeds small, 15 ± mm. long.

Pandanus pulposus var. *cooperi* Martelli.

Drupes 7.5 cm. long, 3.5 cm. diam., composed of 8-9 locules; endocarp 2.5 cm. thick, located mostly above the center of the drupe.

¹ All plants described in this paper are in the herbarium of Bernice P. Bishop Museum.

In Martelli's description it is stated that the endocarp is found at the center of the drupe; this is evidently an error, because his published illustrations (op. cit., table 38, fig. 3), also those of Rock (College of Hawaii, Bull. 4, fig. 3, 1916), show clearly the position of the endocarp completely or almost completely above the center.

The species occurs on Marshall and Radack islands; the variety, on Palmyra Island.

***Pandanus bergmanii*, new species (fig. 1).**

Shrubs $5 \pm$ m. in height. Leaves 110 cm. long, $5 \pm$ cm. broad at the base, tapering gradually to an acute apex, coarsely spinose-serrate along the margin, except at the base, the midrib with distant spines in the upper position; the spines sharp, stout, $2 \pm$ mm. in length; syncarpium broadly ellipsoidal, 29×34 cm., composed of $87 \pm$ drupes; drupes of great size, long pyriform in shape, irregularly pentagonal in cross-section outline, $12 \pm$ cm. long, $6.5 \pm$ cm. in diameter, tapering and curving inwardly from the upper third into a long narrow base, free and divergent in the upper third, slightly convex at the apex; apical sutures prominent, shallow; lateral sutures prominent, separating the carpels by narrow furrows of moderate depth, rarely superficial; stigma subhippocrepiform, suborbicular, small, $3 \pm$ mm. in diameter, oblique, slightly protruding, situated in an apical depression of the drupe, centrally located in the central drupes, inwardly eccentric in the outer drupes; carpels (locules) $6-9+$ in number, concentrically arranged, the outer ones of large diameter, the inner ones much reduced; endocarp situated in the center of the upper half of the drupe, irregularly circular in longitudinal section, small, $3.5 \pm$ cm. in diameter, rimose, composed partly of hard osseous tissue, and partly of light-colored rather soft material; apical mesocarp divided into well defined locular chambers, the outer ones large, 2.5 cm. in diameter, the inner ones small, $1 \pm$ cm. in diameter, traversed by distant fibrovascular strands with large intrafascicular air cavities and air-containing pith (aerenchyma); basal mesocarp abundant, $8 \pm$ cm. long, succulent, with slender fibrovascular strands 0.1-0.2 mm. in diameter, imbedded in succulent parenchyma stored with starch and aleurone; seeds small, $12 \pm$ mm. in length.

Washington Island, August 18, 1924, H. F. Bergman, no. 104, type.

A distinct species with very large drupes, each containing a small endocarp situated well above the center. It is evidently rather closely related to *P. leram* (Section *Hombromia* Warburg), of Nicobar and Andaman islands, but differs from this species in the relatively primitive concentric arrangement of the carpels—a sectional character which, however, may not indicate a wide phylogenetic relationship of the two species, as continued reduction of the central carpels would ultimately result in a 1-2-serried arrangement very similar to that of *P. leram*. Certain characters of the drupe, such as the large proportion of edible mesocarp tissue and small nonedible endo-

carp tissue, may be the result, partly, of selective cultivation by early races of man.

Endemic in Washington Island. It is not improbable that this species may be a variety of ancient cultivation and of aboriginal introduction in Washington Island. It is of interest to note, in this connection, that Hedley (Australian Mus., Mem., vol. 3, p. 30, 1896-

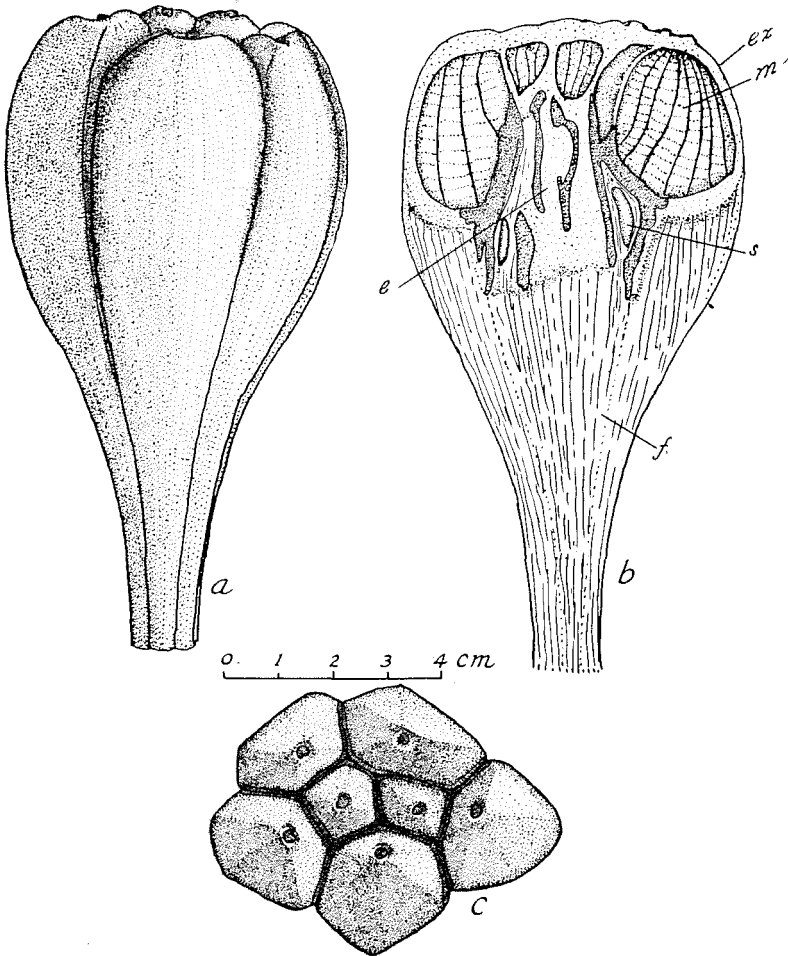


FIGURE 1.—Coral island type of *Pandanus*, *P. bergmanii*: a, lateral view; b, fruit (e, endocarp; f, fibrous mesocarp; ex, exocarp; m, apical mesocarp; s, seed); c, apical view.

1897) finds that one of the edible varieties of Funafuti, called *fala kai* (edible *fala*) by the natives, was introduced from Gilbert Islands.

LEPTURUS R. Brown

Lepturus repens R. Brown var. **maldenensis**, new variety (fig. 2, *a*).

Plant $30 \pm$ cm. in height; leaves $10 \pm$ cm. in length, convolute; ligule $0.5 \pm$ mm.; spikelets with one fertile and one vestigial flower; outer glume short, $5 \pm$ mm. in length, puberulent at the end, acute; fertile glume and palea $4.5 \pm$ mm. long.

Malden Island, November 22, 1924, Gerrit P. Wilder, no 1, type.

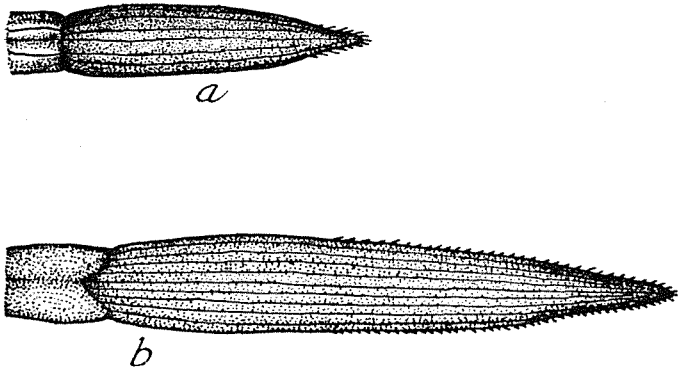


FIGURE 2.—Glumes of *Lepturus repens*: *a*, variety *maldenensis*; *b*, variety *palmyrae*.

Lepturus repens R. Brown var. **palmyrae**, new variety (fig. 2, *b*).

Stems long, $65 \pm$ cm. in height, [if supported]; leaf blades very long, $7-35 +$ cm. in length, flat, $4-7 +$ mm. in width, spinulose serrate, glabrate; ligule short, $0.5 \pm$ mm., ciliate; spikes long, up to $15 +$ cm. in length; rachis slender, minutely puberulent; spikelets with one fertile and one vestigial floret; outer glume $9 \pm$ mm., acute, ciliate; fertile glume and palea 5 mm., the glume minutely puberulent in the upper portion.

Palmyra Island, July, 1913, J. F. Rock, no. 10276A, type.

ISCHAEMUM Linnaeus

Ischaemum lutescens Hackel.

Ischaemum byrone (Trinius) Hitchcock.

Original description amplified by Forest B. H. Brown:

Culm erect, free from the sheaths only for a short distance from the inflorescence; nodes weakly bearded or glabrous; sheaths compressed, glabrous or, in young growth, bearing scattered long hairs on the lower surface; ligule 3-4 mm. long, thin and hyaline in the center, thicker at the sides and joined with the auriculate lobes of the sheath; leaf blades 5-20 + cm. in length, 3-5 + mm. in width, glabrous; spikes 2 in number attached at the end of the culm, 4-10 cm. in length; joints of the rachis and pedicels subequal, 3-4 mm. in length, thick, $1 \pm$ mm. in diameter, triangular, concave and tridentate at the end, pilose at the base and along the angles. Sessile spikelet lanceolate, $7 \pm$ mm. long, violet in color in the upper portion, pilose at the base with silky hairs one-half the length of the spikelet; glume no. 1 bidentate at the apex, pilose with long hairs on the back; glume no. 2 carinate, nearly of the same length as the first, scabrous toward the tip, minutely bidentate at the apex, bearing an awn of nearly one-half the length of the glume, long pilose in variety *pilosum*; third glume slightly shorter, lanceolate; fourth glume nearly one-half as long as the second, thin, glabrous or ciliate, 2-lobed at the apex, bearing an awn of 12-20 + mm. from the sinus, the twisted column extending beyond the glumes; anthers 2 mm. long. Pedicellate spikelets $5 \pm$ mm. in length, pilose at the base, the first glume terminating in a short awn of nearly one-fourth the length of the spikelet, pilose on the dorsal surface; awns of second glume and fourth glume similar to those of the first but shorter.

Ischaemum lutescens Hackel var. typicum.

Third glume of sessile spikelet glabrous.

Distributed in Hawaii.

Ischaemum lutescens Hackel var. pilosum, new variety.

Third glume more or less long-pilose on the dorsal surface.

Cook Islands, Aitutaki, near seashore, April 15, 1925, Gerrit P. Wilder, no. 337, type. Native name: *matie*.

CYPERACEAE

CYPERUS Linnaeus f.

Cyperus tenellus Linnaeus var. australiensis, new variety.

Culms 1-8 cm. in height; spikelets large in comparison with the size of the plant, 1-3 in number; involucre bracts two in number, one erect, much longer than the second which is spreading; glumes light-green to brown in color, 5-8-veined; stamens 1-2.

Australia, New South Wales, October, 1908, J. H. Camfield; Australia, Victoria, October to December, 1912, J. E. Tilden. Type, Camfield no. 1; reference types, Tilden nos. 860 and 724. In Australia and North Island, New Zealand, "sea level to 500 meters altitude."

CLADIUM P. Browne

Cladium angustifolium Benthani and Hooker.

* Stem compressed, $100 \pm$ cm. in height, smooth along the angles; leaves somewhat as in *Cladium meyenii* but broader ($25 \pm$ mm.), $150 \pm$ cm. in length; panicle somewhat lax, the branches rather slender, slightly sinuate, smooth; basal bracts with long sheaths and short blades not as long as the panicle branches; spikelets grouped $7 \pm$ in a cluster, dark-brown in color, $6 \pm$ mm. long, with $4 \pm$ flowers, the $7 \pm$ glumes 2-ranked; style 3-parted, the branches exserted, somewhat thickened and pubescent at the base; achenes sharply triangular, $2 \pm$ mm. in length.

Tahiti, altitude about 700 meters, June 3, 1927, L. H. MacDaniels; Tahiti, altitude about 1848 meters, E. H. Quayle. Reference types: MacDaniels, no. 1600: Quayle nos. X (August 1-3, 1922) and 49 (September 23, 1921).

Area of distribution includes Society Islands and Hawaii.

CAREX Linnaeus

Carex tahitensis, new species (fig. 3).

Perennial; culms short, $20 \pm$ cm. in length, sharply triangular with convex sides, sharply spinulose serrate on the angles; leaves much longer than the culm, up to $60 +$ cm. in length, and 5 mm. in width, sharply spinulose serrate along the margin and keel, the basal leaves reduced to sheaths of 1-7 cm.; inflorescence 10-20 cm. in length, composed of $6 \pm$ cylindrical, long-pedunculate, loosely racemose spikes single from the axil of long foliaceous or subulate clasping bracts, the lowest two or three extending beyond the raceme; spikes $3 \pm$ cm., dark to light brown in color, commonly carpellate and $8 \pm$ mm. in diameter in the basal two-thirds and staminate in the apical third; peduncles slender, compressed, suberect, very sharply spinulose serrate along the angles, 1-7 + cm. in length, the basal one longer than the rest; lower floral bracts leaf-like, clasping at the base, the basal one $25 \pm$ cm. in length, the succeeding one or two shorter but longer than the inflorescence, the upper ones subulate, shorter than the inflorescence; scale of staminate floret lanceolate, $3 \pm$ mm. long, $1 \pm$ mm. in width, mucronulate, 1-veined, or indistinctly 3-veined; scale of carpellate flower oblong lanceolate, $2.5 \pm$ mm. in length, $1 \pm$ mm. in width, 3-veined; perigynium 3-4 + mm. long, irregularly biconvex, many veined, the apex acute, the mouth bidentate; achene dull-yellow to brownish in color, minutely punctuate under strong magnification, compressed, biconvex, orbicular-ovovate in outline, apiculate, $1.7 \pm$ mm. in length, $1.2 \pm$ mm. in width; style 2-parted, with slender stigmatic branches of $1 \pm$ mm.

Tahiti, south slopes of Orohena, altitude about 1200 meters, May 15, 1927, L. H. MacDaniels, no. 1542, type.

Closely allied to *Carex feani* of the Marquesas, from which it is readily distinguished by the dwarf habit, short culm, minute-bidentate mouth of perigynium. Endemic, infrequent at high altitudes. Native name: *matie*.

ELEOCHARIS (HELEOCHARIS) R. Brown

Eleocharis caribaea Blake (**Eleocharis capitata** auct.).

Original description amplified by Forest B. H. Brown:

Perennial; culms caespitose, 10-50 + cm. tall, slender, erect or nodding, longitudinally furrowed; inner leaf sheath 15 to 30 + mm. long, the opening oblique and acutely pointed at one side, glabrous, brownish-yellow or purple in color; spikelet ovoid to subglobose in shape, 3-5 + mm. in length, $3 \pm$ mm. wide, brown or purplish in color when dry; glumes numerous, compactly imbricate in several ranks, all fertile except one or two at the base, deciduous, broadly ovate, concave, subacute or obtuse, broadly truncate at the base, $2 \pm$ mm. long, glabrous, brown or purple in color with a hyaline border and green keel; stamens 3 in number, the thin compressed filaments 1-2 + mm. in length, the anthers narrowly lanceolate, acuminate, $0.5 \pm$ mm. long; hypogynous bristles $6 \pm$ in number, $1.5 \pm$ mm. in length, retrorsely barbulate; style short, 0.2-0.7 mm. long, abruptly dilated at the base, the two, rarely three, stigmatic branches $1 \pm$ mm. in length; achene shortly stalked, obovate, $0.7 \pm$ mm. in length, jet-black in color, tipped by a whitish, tubercle-like persistent base of the style.

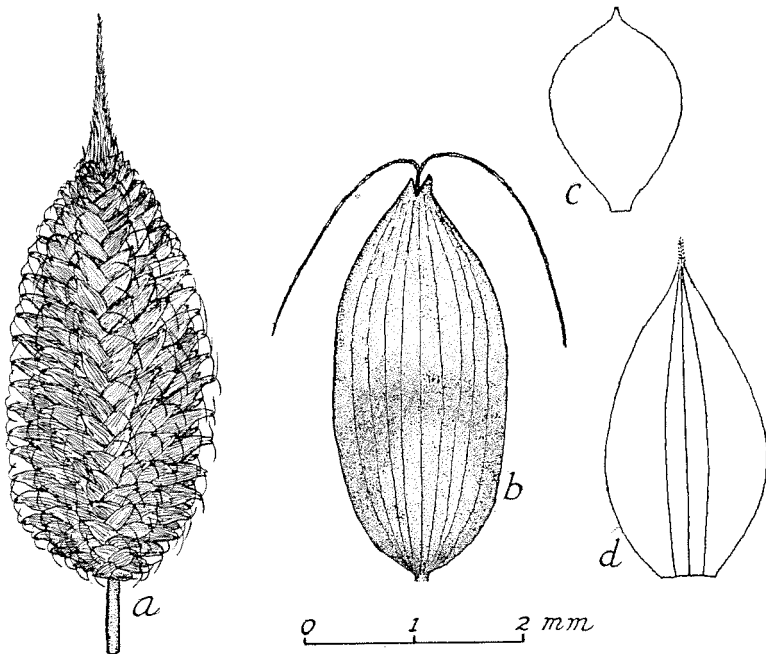


FIGURE 3.—Features of *Carex tahitensis*: a, spike; b, perigynium containing achene, style branches exerted from the bidentate mouth; c, achene; d, scalelike glume from carpellate portion of spike.

Scale applies to b, c, d.

Reference types show variations as follows:

Setchell no. 269. Culms $20 \pm$ cm. tall; inner sheath $15 \pm$ mm., purplish, oblique and acutely pointed, not dentate at the opening; glumes $2 \pm$ mm., obtuse, light-brown in color with a greenish keel and hyaline border; filaments 2 mm.; 6 hypogynous bristles 1.5 mm. in length; style 2-parted, very short, 0.2 mm. in length, the branches 1 mm.; achene obovate, 0.7 mm. in length, jet-black.

Setchell no. 133. Culms up to $50 \pm$ cm. tall; inner sheath 30 mm., yellow with a purple base; spikelets 5 mm., long, 3 mm. broad; glumes 2 mm.; filaments 1.5 mm.; 6 hypogynous bristles of $1.5 \pm$ mm.; achene 0.7 mm.; style 0.3 mm. with two stigmatic branches of 1 mm.

Wilder no. 316. Culms 7 cm. tall; inner sheath 13 mm., yellowish with a purple base; spikelet 3 mm. in length, 2.5 mm. in width; glumes 2 mm.; filaments 1.5 mm.; 6 hypogynous bristles of 1.5 mm.; achene 0.7 mm.

Tahiti, W. A. Setchell: no. 133, May 25, 1922; no. 269, June 5, 1922; reference types. Tahiti, Papieri, March 20, 1925, Gerrit P. Wilder, no. 316, reference type.

The Tahitian variety of this pantropic species is distinguished by (1) the oblique, acutely pointed (not unidentate) opening of the leaf sheath, (2) light-brown color of the glumes, (3) filaments of 0.2 mm., (4) 6 hypogynous bristles of 1.5 mm., (5) very short style of 0.2 mm. with two branches of 1 mm.

LILIACEAE

ASTELIA Banks and Solander

Astelia nadeaudi Drake.

Original description amplified by Forest B. H. Brown:

Plant $1 \pm$ m. in height, white, pubescent; leaves narrowly lanceolate, 50-100+ cm. in length, 2-4+ cm. wide, tapering to a long slender tip, the margin incurved, with a single prominent midvein and several less prominent ones, white pubescent on the under surface, pubescent to glabrate above; floral leaves from the lower branches of the panicle, 10-30+ cm. in length; panicle $30 \pm$ cm. with branches of 5-20+ cm., white pubescent, supported on a slender stem of $50 \pm$ cm.; staminate flowers on pedicels of $8 \pm$ mm., the stamens with rather slender filaments of $1.5 \pm$ mm., the sterile ovulary prominent, conical, $1 \pm$ mm. in height; carpellate flowers on relatively short thick pedicels; perianth segments glabrous on the inner surface, oblong-lanceolate, acute, $4 \pm$ mm. in length, the outer ones pubescent on the outer surface, the inner ones with a tuft or line of hairs on the outer surface; seeds numerous, black, oblong, curved, $1.5 \pm$ mm. in length, the outer covering hard.

Tahiti, altitude 1650 meters, May 16, 1927, L. H. MacDaniels, nos. 1494 and 1488, reference types. Tahiti, Aorai Ridge, altitude 386-2000 meters, E. H. Quayle, nos. C1, C2, C3, (August 1-3, 1922) and 68 (September 23-27, 1921), reference types.

Endemic in Society Islands.

DIANELLA Lamarck

Dianella intermedia Endlicher var. **norfolkensis**, new variety.

Leaves 50-100 cm. in length 12-18 + mm. in width, obscurely spinulose-serrate to smooth along the margin and keel; flowers small; tepals 5 mm. long, the outer series 5-veined, greenish-white to purplish in color, not distinctly punctate; inner tepals somewhat broader, 3-veined with a wide hyaline border, nearly white in color; anthers $2.5 \pm$ mm. in length, commonly longer than the filaments; seed broadly oval, subacute, truncate at the base, $3.5 \pm$ mm. long.

New Zealand, Kauri Gulch, near Auckland, January 16, 1921, F. B. H. Brown, no. 162, reference type.

Leaves obscurely serrulate to smooth, $60 \pm$ cm. in length, $18 \pm$ mm. in width; panicle of nearly the same height as the leaves; flowers small; tepals 5 mm. long, not distinctly punctate; outer tepals 5-veined, greenish in color; inner tepals slightly wider, 3-veined, nearly white; anthers 2.5 mm., nearly twice the length of the filaments; seed broadly ovate-elliptical in outline, obtuse to subacute at the apex, truncate or obtusely rounded at the base, $4 \pm$ mm. in length, 2.5-3 mm. in width.

Fiji, Lakemba, September 3, 1924, Edwin H. Bryan, Jr., no. 534, reference type.

The area of distribution includes Norfolk Island, Fiji at moderate altitudes, and New Zealand from sea level to about 800 meters (Cheeseman: Manual of New Zealand flora, p. 320, 1925). Native names in New Zealand are *pepe*, *piopio*, and *turutu*; in Fiji, *vara vara*.

ORCHIDACEAE

PHAJUS Loureiro.

Terrestrial or epiphytic herbs with or without pseudobulbs; leaves large, plicate, petiolate or sessile; scape lateral, axillary or, apparently, terminal, bearing a raceme of showy flowers, violet, yellow, or white in color; sepals and petals subequal, or the petals relatively narrow; labellum commonly with a pocket or a tubular spur at the base, the lateral lobes directed upward around the column; column elongated, 2-angular or 2-alate; anther 2-locular; 8-pollinia; capsule ellipsoidal with prominent ribs.

About 50 species similar to *Calanthe* in distribution, centering in Indo-Malaya and best represented in Java, extending south to Australia, north to Japan and eastward through New Caledonia, Fiji, Samoa, to Tahiti; few species in Africa or Madagascar or New Guinea; absent from America, Europe, New Zealand, and the Marquesas.

Phajus tahitensis Schlechter (fig. 4).

Calanthe grandiflora Nadeaud.

Original description amplified by Forest B. H. Brown:

Terrestrial herb 1 ± meters in height, resembling *Calanthe* in general appearance; stem 30 ± cm. in height, terminating in 5 ± closely approximate leaves with 4 ± sheathing bracts in the lower portion, slightly thickened at the base forming a slender pseudobulb; leaves lanceolate, acuminate, the blades 10-60 + cm. in length, 5-11 + cm. in width with 5 ± prominent longitudinal veins and numerous smaller ones, glabrous, permanently dark-green in color, subplicate, tapering gradually to a narrow sheathing base, or forming a petiole 2-25 + cm. in length, widely dilated and sheathing at the base; scape axillary, glabrous, up to 70 + cm. in length, terminating in a raceme of 10-20 + showy flowers, the lower portion with 3 ± sterile persistent bracts of 5 ± cm., forming an obliquely pointed sheath closed at the base; inflorescence bracts lanceolate boat-shaped, 35 ± mm., 5-7-veined, glabrous, folded around the flower bud, deciduous; pedicel and ovulary 2-3 cm., glabrous; sepals,

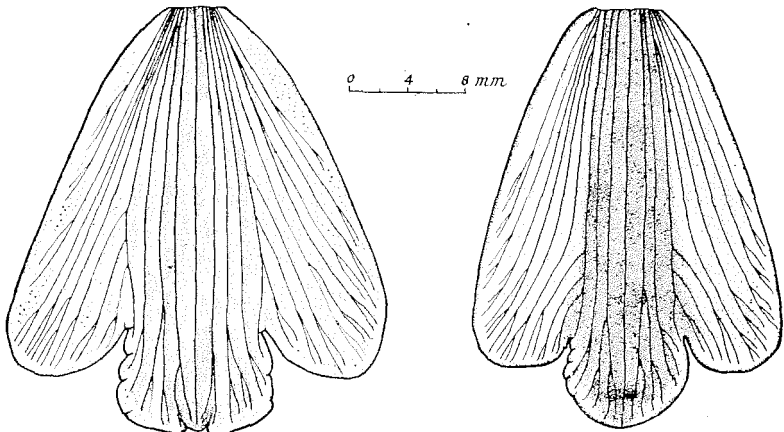


FIGURE 4.—*Phajus tahitensis*, showing variations in form of labellum.

petals, and labellum 28 ± mm., white in color with prominent dark veins; sepals lanceolate, acute, 10 ± mm. broad, 5-6-veined, thin, glabrous; petals thin oblanceolate, subacute, 8 ± mm. broad, glabrous, with 5 ± prominent veins; labellum cuneate when spread flat, many-veined, 21-26 + mm. broad, attached to the base of the column, without spur or distinct pocket, the broad anterior portion 3-lobed, the lateral lobes slightly posterior with reference to the apical one, subsemicircular, 6-10 mm. broad, 7 ± veined, the anterior lobe 6 ± mm. long, 8 ± mm. wide, retuse or subtruncate or obtusely rounded; central portion of labellum densely pubescent with brittle, fusiform, unicellular hairs of 0.2-0.6 + mm.; column free, 2-alate, subcylindrical, 20 ± mm. long, 1.5 ± mm. broad near the base, 3 ± mm. broad near the end; fruiting pedicel reflexed, 10-18 + mm.; capsule ellipsoidal, 40 ± mm. in length, beaked by the persistent column.

The single species from the Society Islands (*P. tahitensis*) apparently belongs to the section *Persomeria* Schlechter of Madagascar and the Mascarene Islands. This section is characterized by an

elongated stem, lateral scape, and spur reduced to a shallow pocket or tubercle; according to Schlechter (Die Orchidaceen von Deutsch-Neu-Guinea, Band 1, Heft 5, p. 373, 1912), members of this section occur in New Guinea as well as Madagascar; this species is also remarkably similar to *Phajus gracfeii* of Fiji and Samoa in shape of labellum, sepals and petals as illustrated by Rechinger (Akad. Wiss. Wien, Denk., vol. 3, pl. 1, fig. 8, 1910).

In Tahiti two forms may be distinguished by the shape of the labellum. In reference type MacDaniels no. 1468, the labellum is broad, $26 \pm$ mm. in width, the anterior lobe subtruncately rounded and retuse at the apex, $11 \pm$ mm. in width, $8 \pm$ mm. in length. In reference type MacDaniels no. 1636, the labellum is the same as in the type except that the apical lobe is subtruncately rounded, not retuse. (See fig. 4.)

***Phajus tahitensis* Schlechter form *typica*.**

Labellum broad, $26 \pm$ mm. in width, the anterior lobe subtruncately rounded and retuse at the apex, $11 \pm$ mm. in width, $8 \pm$ mm. in length.

Tahiti, Papenoo Valley, altitude 200 meters, May 18, 1927, L. H. MacDaniels, no. 1468, reference type. Papenoo Valley is the type locality for the species.

***Phajus tahitensis* Schlechter form *obtusa*.**

Same as *typica* but the apical lobe subtruncately rounded, not retuse.

Tahiti, Maere Valley, altitude 300 meters, June 7, 1927, L. H. MacDaniels, no. 1636, type.

CALANTHE R. Brown

***Calanthe gracillima* Lindley (fig. 5, a).**

Original description amplified by Forest B. H. Brown:

Perennial terrestrial herb, $140 \pm$ cm. in height; leaves $4 \pm$ in number from a short stem, the leaves 40-90 + cm. long, including petiole; blades

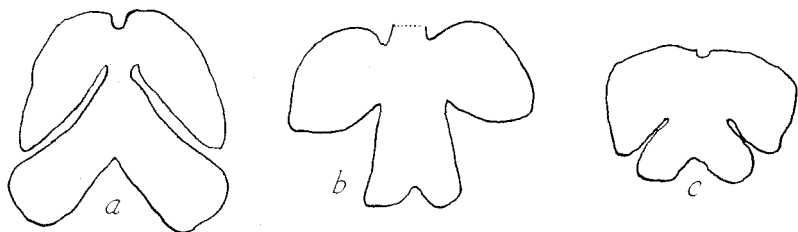


FIGURE 5.—Forms of labellum in *Calanthe*: a, *Calanthe gracillima*; b, *Calanthe tahitensis* var. *typica*; c, *Calanthe tahitensis* var. *delloidea*.

lanceolate, acute, $50 \pm$ cm. in length, $8-15 +$ cm. in width, with $5 \pm$ prominent longitudinal veins and numerous smaller ones, subplicate, permanently dark-green in color, glabrous, narrowed into a concave petiole of $25 \pm$ cm. sheathing at the base; scape lateral or terminal, $140 \pm$ cm., bearing a subspicate minutely puberulent, numerously flowered raceme of $15 \pm$ cm. at the end; flowers commonly single from the axil of each bract, white in color; pedicel and ovulary $15-25 +$ mm. puberulent; sepals subequal, broadly elliptical, $10-12 +$ mm. in length, $5-6 \pm$ mm. in width, white in color, puberulent outside, especially at the apex, $5 \pm$ veined; petals narrower and commonly somewhat shorter than the sepals, obovate, subspatulate, obtuse or acute at the apex, $10-11 +$ mm. in length, $3-4$ mm. in width, 3-veined or imperfectly 5-veined, white in color, glabrous or glabrate; labellum broadly obovate in outline, auriculate at the base, slightly longer than broad, not exceeding the sepals, as a rule, $8-10 +$ mm. long, glabrous, distinctly veined, nearly white in color, the lobes 4 in number, subequal, the lateral ones obtuse or subacute in the upper apical portion, somewhat shorter than the 2-lobed apical portion of the labellum, the 2 lobes of which diverge at an angle of nearly 90 degrees, forming an apical sinus of $3-4$ mm. in depth; callous appendages present near the base, plainly visible with a lens, yellow in color; spur much longer than the sepals, $15 \pm$ mm., rather thick, $1-1.5 \pm$ mm. in diameter, puberulent; capsule ellipsoidal, $25 \pm$ mm. long, nearly black when dry; fruiting pedicel $10-20$ mm.

Tahiti, Papara, head of moist valley, altitude 400 meters, June 28, 1925, L. H. MacDaniels, no. 1719, reference type. Tahiti, August 1-3, 1922, E. H. Quayle, no. 133, reference type. Tahiti, Pirae-Moua Aorai Trail, August 1-3, 1922, E. H. Quayle, no. X, reference type.

Evidently very closely allied to the relatively primitive Indo-Malayan *Calanthe veratrifolia* R. Brown (not Hooker and Arnott), distributed from Asia through the East Indies to Australia, eastward to Samoa; readily distinguished from *Calanthe veratrifolia* by the short labellum, the relatively short thick spurs, shorter sepals and petals. This is evidently the *Calanthe veratrifolia* of Hooker and Arnott. (The botany of Captain Beechey's voyage, p. 71, London, 1833-40). Endemic to Society Islands. Native name *tupu* in Tahiti. Cheeseman (The flora of Rarotonga, Linnaean Soc. London, vol. 6, pt. 6, pp. 261-313, 1903) states that in the Cook Islands the name *nutupu* is applied to *Phajus grandifolius*.

***Calanthe tahitensis* Nadeaud var. *typica*, new variety (fig. 5, b).**

Labellum $8-9 +$ mm. long, distinctly auriculate at the base, the anterior portion elongated, subligulate in shape, $5 \pm$ mm. long, $4 \pm$ mm. wide at the emarginate apex, $3 \pm$ mm. broad below, the lateral sinuses very broad.

Tahiti, Virao, altitude 250 meters, June 15, 1927, L. H. MacDaniels, no. 1690, type.

Distribution confined to Society Islands.

Calanthe tahitensis Nadeaud var. **deltoides**, new variety (fig. 5, c).

Labellum 7-8 + mm., slightly auriculate at the base, the anterior portion inversely triangular, very short, $2.5 \pm$ mm. in length, broad at the apex which measures $5.5 \pm$ mm. in width; lateral sinuses very narrow.

Tahiti, south side of Mount Orohena, altitude about 1400 meters, May 16, 1927, L. H. MacDaniels, no. 1497, type.

DENDROBIUM Swartz

Epiphytic herbs; stem elongated, somewhat woody in some species, or short, with or without pseudobulbs; leaves various, never plicate; inflorescence lateral or pseudoterminal; flowers medium, few, small; sepals subequal, the two lateral ones wide at the base, adnate with the column forming a sac or short spur; petals narrower than the sepals as a rule, wider in few specimens; labellum contracted at the base, incumbent or adnate with the foot of the column, commonly 3-lobed, the lateral lobes either embracing the column or spreading, or, in some species, reduced, the terminal lobe flat or saccate; column short, 2-alate, or bidentate at the end, in most specimens produced at the base in a long foot; anther terminal, lid-like; 4 pollinia; capsule obovoid or oblong.

About 600 species, centering in the Malaysian region, extending into southeastern Asia, south to Australia, through New Zealand into subantarctic Stewart Island, eastward to the Society Islands; not collected in the Marquesas.

Key

- 1 Leaves cylindrical.....*Dendrobium crispatum*
 1 Leaves flat (2)
 2 Leaves linear-lanceolate.....*Dendrobium biflorum*
 2 Leaves ovate-lanceolate*Dendrobium involutum*

Dendrobium biflorum Swartz (Kränzlin: Das Pflanzenreich, vol. 45, pt. 4, 50, p. 168, fig. 11, 1910); Samoan form shown in habitat photograph (Rechinger: Akad. Wiss. Wien, Denk., vol. 3, p. 85, fig. 11, 1910).

Original description amplified by Forest B. H. Brown:

Epiphytic; pseudobulbs absent; stems long, slender, drooping, $70 \pm$ cm. in length, $2 \pm$ mm. in diameter, smooth, shining, yellow in color when dry, woody with a hollow center; leaves numerous, distichous, $2 \pm$ cm. distant, the blades linear-lanceolate, 5- to 10 + cm. long, $4 \pm$ mm. wide, 3-veined, attenuate acute or acutely 2-lobed, somewhat contracted at the base, glabrous; leaf sheath $18 \pm$ mm., glabrous; inflorescence lateral from $3 \pm$ scalelike bracts of $4 \pm$ mm.; flowers of medium size, nearly 3 cm. in diameter when spread out, creamy-white and pink in color, 2 in each fascicle, few in number; pedicels slender $1 \pm$ cm., from a common peduncle of $5 \pm$ mm.; sepals linear-lanceolate, $16 \pm$ mm., 5-veined, terminating in a long slender tip, creamy-white in color, the 2 lateral ones dilated and united at the base, adnate with the column, forming a shallow pocket or sac; petals relatively short, narrow, narrowly lanceolate, acute, 3-veined, $8 \pm$ mm., white in color; labellum

narrowed at the base and adnate with the column, the anterior portion broadly elliptical in outline from a short clawlike junction with the adnate base, $9 \pm$ mm. long, $5 \pm$ mm. wide, yellowish-white in color shading to bright-pink, 3-lobed, the lateral lobes short, subacute, spreading or ascending, glabrous, entire, the central lobe broad at the base, tapering into a long narrow acuminate acute tip, $4 \pm$ mm. long, conspicuously papillose under a lens with a fimbriate lateral margin; young capsule oblong ellipsoidal, $7 \pm$ mm. in length, $3 \pm$ mm. in width, finally 30 mm. x 9 mm.

Samoa, no date, D. W. Garber, no. 575 (without fruit or flowers), reference type. Tahiti, Mount Aorai, Noha Ridge, altitude 1100 meters, September 27, 1921, E. H. Quayle, no. 58, reference type. Tahiti, June 22, 1922, W. A. Setchell, no. 456, reference type. Tahiti, altitude 200 meters, June 15, 1927, L. H. MacDaniels, no. 1686, reference type.

Closely allied to the somewhat more primitive *Dendrobium cunninghamii* of New Zealand, which extends through the North and South Islands of New Zealand to the subantarctic region of Stewart Island; distinguished from *cunninghamii* by its longer leaves, reduced inflorescence, narrow petals and sepals and the narrow anterior lobe of the labellum. The stem of the Samoan plant is somewhat thicker and the leaves smaller than in the specimens from Tahiti, which suggests that the Society Islands form may not be identical with that from Samoa, and probably Fiji. No. 578, however, is without flowers or fruits, so that accurate comparison is impossible at present. The upper central surface of the labellum bears crowded, simple or forked thin-walled hairs $9 \pm \mu$ in length, which are rich in protoplasmic contents and may serve the purpose of forage hairs (*Futterhaare*) for visiting insects. Although very prominent in the representatives from Tahiti and Raiatea, they are apparently not mentioned or illustrated in the specimens from Fiji or Samoa. Drake del Castillo (*Flora de la Polynesie Francaise*, Paris, 1892) states that this species is found on trees at altitudes of about 200 meters. He gives as native names *mave* and *ofe-ofe*. Credited (not verified) also to Samoa and Fiji.

***Dendrobium involutum* Lindley.**

Original description amplified by Forest B. H. Brown:

Epiphytic; stems several from a short rhizome, rather slender, cylindrical, drooping or suberect, 10-80 + cm. in length, $1.5 \pm$ mm. in diameter, the internodes $8 \pm$ mm., enclosed in the leaf sheath, somewhat woody; leaves distichous, the blade ovate-lanceolate, 2-4 cm., rarely 5 + cm., in length, $8 \pm$ mm. in width, obliquely 2-lobed at the apex, glabrous, coriaceous; sheaths $1 \pm$ cm.,

striated; flowers lateral in fascicles of 2, from a cone of short obtuse bracts; peduncle very short, $1.5 \pm$ mm., not extending beyond the basal cone of bracts; pedicel $5 \pm$ mm.; ovulary $4 \pm$ mm.; flowers few in number, $15 \pm$ mm. in diameter, light-yellow in color; sepals lanceolate, $7 \pm$ mm. long, $2 \pm$ mm. wide at the base, 3-5-veined, terminating in a thickened curved apex, the lateral ones dilated and united at the base, adnate with the column, forming a pocket-like sac; petals narrower and slightly shorter, narrowly lanceolate acute, $1 \pm$ mm. in width, 3-veined; labellum light-yellow (slightly pinkish tinge ?) narrowed at the base which is adnate with the foot of the column, the anterior free portion broadly elliptical in outline, $6 \pm$ mm., 3-lobed, the 2 lateral lobes short, $2 \pm$ mm. long, spreading, subacute, the central lobe triangular ovate, acute, $4 \pm$ mm. in length, $2 \pm$ mm. in width, fimbriate along the lateral margin, conspicuously papillose-pubescent on the surface; column with 2 short obtuse processes at the end; anther suborbicular, stalked; young capsule fusiform, $1 \pm$ cm. in length, $3 \pm$ mm. in diameter.

Tahiti, Papenoo Valley, altitude 100 meters, May 19, 1927, L. H. MacDaniels, nos. 1517 and 1522, reference types. Tahiti, Pirae-Moua Aorai Trail, August 1-3, 1922, E. H. Quayle, no. X, reference type. Samoa, Fitiuta Trail, August 4, 1921, D. W. Garber, no. 557, reference type.

Closely allied to *Dendrobium biflorum*. MacDaniels no. 1298, without flowers or fruits, may be a distinct form or variety; leaves up to 7 cm. in length and $1 \pm$ cm. in width resembling Garber no. 557 from Samoa.

The area of distribution includes Society Islands, where it grows on trees at an altitude of about 100 meters.

***Dendrobium crispatum* Swartz.**

Original description amplified by Forest B. H. Brown:

Epiphytic on trees; stem slender, $1-2 +$ mm. in diameter, $40 \pm$ cm. in length, the internodes 5- to $20 +$ mm., smooth, rather woody, with numerous lateral branches terminating in a single cylindrical leaf; leaf blade cylindrical, $10-15 +$ cm. in length, $2 \pm$ mm. in diameter, soon deciduous, the sheath thin, persistent after the fall of the blade, $1 \pm$ cm.; raceme subterminal, $7 \pm$ cm., bearing $5 \pm$ flowers, light-yellow, fragrant ($10 \pm$ flower scars); ovulary and pedicel $1-2 +$ cm.; sepals $18 \pm$ mm., light-yellow in color, 3-veined, the dorsal one $3 \pm$ mm. wide at the base tapering gradually to a subacute tip, the 2 lateral ones united at the base forming a hood of $4 \pm$ mm.; petals nearly as long as the sepals, slightly narrower, 3-veined, light-yellow in color; labellum pink to yellow in color, narrowly ovate-lanceolate in outline, cuneate at the base, gradually acuminate toward the apex, $15 \pm$ mm. long, $5 \pm$ mm. wide near the base, 3-lobed, the lateral lobes shallow, subacute, the median lobe $1 \pm$ cm. in length, narrow, acuminate, $4 \pm$ mm, broad at the base, curled along the margin, glabrous, bearing three prominent, keel-like wavy longitudinal crests near the center.

Tahiti, south of Orohena, altitude 1200 meters, May 15, 1927, L. H. MacDaniels, no. 1476, reference type. Tahiti, Mount Aorai,

Noha Ridge, altitude 1090 meters, September 27, 1921, E. H. Quayle, no. 63, reference type. Tahiti, Virao, windward slopes, altitude 60 meters, October 14, 1921, E. H. Quayle, no. 120, reference type.

Area of distribution includes Society Islands. Credited to New Caledonia by Kränzlein (*Das Pflanzenreich*, vol. 45, pt. 4, 50, p. 293, 1910) and to Fiji by Seemann (*Flora Vitiensis*, p. 303, London, 1865-1873).

CIRRHOPETALUM Lindley

Herbs with pseudobulbs, unifoliolate; scape from the side of the pseudobulb, bearing a subumbellate cluster of flowers at the end; posterior sepal very short; lateral sepals elongated; petals shorter than the lateral sepals; labellum small, stipitate, joined with the end of the column, entire or auriculate; column 2-alate, short; anther hemispherical, operculate; 4 pollinia; capsule ovoid to fusiform.

About 75 species native chiefly of Asia and the Malay Archipelago; not collected in the Marquesas.

Cirrhopetalum thouarsii Drake.

Original description amplified by Forest B. H. Brown:

Epiphyte 10-20 + cm. in height, with a single leaf terminating a broadly ovate pseudobulb of 1-2 cm. in length, the blade oblong elliptical, 5-12 + cm. in length, 1.5-3 cm. wide, glabrous, emarginate at the apex, coriaceous, many veined, contracted at the base into a petiole of 1-2 cm.; scape slender, from the base of the pseudobulb, 10-20 + cm., with 2 or more clasping bracts of 1-2 cm.; flowers large, yellow in color, fragrant, subumbellate at the end of the scape; pseudobulb $4 \pm$ cm. long; posterior sepal ovate, mucronate, acuminate, $8 \pm$ mm., 5-veined; lateral sepals linear, $30 \pm$ mm. long, $4 \pm$ mm. wide, tapering to an acute apex; petals broadly ovate, $5 \pm$ mm. in length, 3-veined, long ciliate, terminating in a bristle; labellum tongue-shaped, fleshy, $5 \pm$ mm., curved near the base forming an auriculate hook of $2 \pm$ mm.; apex of the column bidentate; fruiting pedicel 10-15 \pm mm.; capsule 25-30 \pm mm. long, $4 \pm$ mm. broad.

Moorea, July 7, 1922, E. H. Quayle, no. 611, reference type.

According to Schlechter, this is not the same as *Cirrhopetalum thouarsii* Lindley of Madagascar (Setchell: *Univ. California Pub., Botany*, vol. 12, p. 163, 1926.)

The plant occurring in Tahiti and Moorea may therefore be a new variety or a new species.

ERIA Lindley

Epiphytic or terrestrial; stems moderately elongated, with or without pseudobulbs; leaves commonly more than one, with or without distinctly articulated base; racemes lateral or axillary; lateral sepals with or without a saclike

base; petals differing little from the sepals; labellum entire or lobed, parallel with the column; column short and thick; anther 2-locular; pollinia 8 in number, pear-shaped, 4 in each locule of the anther; capsule narrow, elongated or fusiform.

About 80 species, distributed from southern Asia through Malaysia and the Pacific islands; absent from Australia and New Zealand; one species in the Society Islands; not collected in the Marquesas.

***Eria setchellii* Schlechter.**

Eria setchellii Schlechter, Setchell: Carnegie Inst. Washington, Pub., vol. 20, p. 162, 1924.

Eria viellardi of Drake del Castillo (Flore de la Polynesie Française, p. 242, pls. XLI and 14, Paris, 1892), non Reichenbach.

Original description amplified by Forest B. H. Brown:

Stems without pseudobulbs, cylindrical, with short internodes 10-30 + cm. in height, bearing several leaves near the end and clasping scales in the lower portion; leaves oblong-lanceolate, acute or obtuse, 2-lobed at the apex, 5-20 + cm. in length, 10-25 mm. in width, rather thin; racemes axillary, up to 16 + cm., commonly longer than the subtending leaf; bracts broadly lanceolate-ovate, 5-7 + mm. in length, 1.5 ± mm. in width, with one or rarely two flowers in the axil; flowers small, creamy-white in color, on short pedicels; sepals oblong-lanceolate, acute, 5 ± mm. in length, 1.5 ± mm. in width, somewhat longer than the petals; petals 4.5 ± mm. long; labellum narrowly triangular-lanceolate, 5 mm. long, 1.5 ± mm. broad at the base, rolled in the form of a conical beak; ovulary and pedicel at first subequal to the bract, elongating in fruiting to 25 mm. (pedicel 3 ± mm.); capsule narrowly spindle-shaped, 20 ± mm. in length, less than 2 mm. in width when dry.

Tahiti, L. H. MacDaniels, no. 1296, (altitude, 200 meters, May 7, 1927), no. 1475 (altitude, 1200 meters, May 15, 1927), no. 1559 (altitude, 150 meters, May 19, 1927), no. 1706 (Vaita Valley, Taaitiva, June 23, 1927), reference types. Tahiti, July 28, 1922, E. H. Quayle, no. 606, reference type. Tahiti, July 7, 1922, W. A. Setchell, no. 516, altitude 600-900 meters, reference type.

Evidently closely allied to *Eria viellardi* Reichenbach of New Caledonia, to which the Tahitian species was referred by Drake del Castillo. Endemic to Society Islands, where it is common on trees at altitudes of 150 to 1200 meters.

PHREATIA Lindley

Epiphytic herbs; stems short, with or without pseudobulbs; leaves with flat or subcylindrical blades articulated with the compressed sheaths; racemes many flowered, from the axils of the lower leaves or on a leafless scape

springing from the base of the stem or rhizome; flowers minute, white or yellowish in color; sepals free and subequal or the 2 lateral ones united to form a hood; petals smaller, free; labellum contracted at the base, articulate with the foot of the column, simple or lobed; anther 2-locular; 8 pollinia; capsule short, broad, commonly subglobose.

About 70 species distributed from Indo-Malaya to Norfolk Island and Tahiti; not collected in the Marquesas. Closely allied to *Eria*, with which it is united by some authors; distinguished from *Eria* by the short stem, complicate leaves, minute flowers, and relatively broad capsules.

Key

- Plant 15-25 cm. in height; leaves single
from the rhizome.....*Phreatia tahitensis*
Plant 5-12 cm. in height; 5 ± leaves.....*Phreatia matthewsii*

Phreatia tahitensis Lindley.

Eria tahitensis Reichenbach.

Original description amplified by Forest B. H. Brown:

Plant 15-25 cm. in height, epiphytic on trees; leaves single from the rhizome, the blade narrowly elliptical oblong in outline, 10-18 cm. in length, 15 ± mm. in width, obtusely 2-lobed at the apex, crowded and complicate at the base which is inclosed in a closed sheath of 3 ± cm.; flowers numerous along the upper half or third of a leafless scape of 10-20 + cm. springing from the rhizome, as high as or somewhat higher than the leaves; floral bracts broadly lanceolate, obtuse or acute, 4 ± mm. long, subequal to the ovulary and pedicel, around which it is folded; bracts of the lower portion of the scape sheathing, 1 ± cm., 5 ± in number; pedicel 1 ± mm.; lower sepal oblong ovate, subacute, 2.3 ± mm. long; lateral sepals of nearly the same (2.3 ± mm.) length, triangular-acute, dilated and united at the base forming a hood with a saclike posterior protrusion; petals ovate acute, slightly shorter than the sepals; labellum broadly triangular, acute, 2.5 ± mm. long, contracted into a curved claw; rostellum with two short, slender, curved, acute appendages; capsule obovoid, 6 ± mm. in length, 4.5 ± mm. in diameter.

Tahiti, L. H. MacDaniels, no. 1507 (Papenoo Valley, altitude 800 meters, May 19, 1927), no. 1558 (Papenoo Valley, altitude 150 meters, May 19, 1927), no. 1582 (Pueu, altitude 250 meters, May 26, 1927), no. 1702 (Tii Valley, June 22, 1927), reference types. Tahiti, August 1-3, 1922, E. H. Quayle, no. X (Pirae-Moua Aorai Trail), reference type.

Endemic to Society Islands, where it is common at an altitude of 150 to 800 meters.

Phreatia matthewsii Reichenbach.

Eria matthewsii Reichenbach.

Original description amplified by Forest B. H. Brown:

Stem very short, $1 \pm$ cm. long, without distinct pseudobulb in dry specimens; leaves 2-ranked, $5 \pm$ in number, the blades oblong linear, $5-12 \pm$ cm. in length, $4 \pm$ mm. in width, obtuse, obliquely 2-lobed at the apex, complicate and narrow at the base, distinctly articulated with the sheath, glabrous; raceme axillary from the lower leaves or from persistent sheaths lower down on the stem, as long as or longer than the leaves, the rachis glabrous, slender, numerously flowered in the upper portion, bearing $2 \pm$ sheathing bracts of $3 \pm$ mm. in the lower portion; floriferous bracts lanceolate, setaceous-acuminate, glabrous, $2 \pm$ mm. in length, as long as the pedicel and ovulary; flowers minute, nearly white in color; lateral sepals broadly triangular acute, $1.5 \pm$ mm. long, $1 \pm$ mm. broad at the base, slightly united forming a small posterior sac, the lower sepal $0.5 \pm$ mm. in width; petals narrowly lanceolate, acute, shorter than the sepals; labellum broadly ovate, subacute, of nearly the same length as the lateral sepals, slightly longer than broad, obscurely 3-lobed near the apex, the middle lobe apiculate; rostellum without appendages; capsule subcylindrical, $2.5 \pm$ mm. in length, $1 \pm$ mm. in diameter, supported on a slender pedicel of $0.5 \pm$ mm.

Tahiti, Papenoo Valley, May 19, 1927, L. H. MacDaniels, no. 1508 (altitude 800 meters), no. 1560 (altitude 150 meters), reference types. Tahiti, Varao, 1922, E. H. Quayle, no. X, reference type.

Endemic to Society Islands, on tree trunks at altitudes of 28 to 800 meters.

LIPARIS Richard

Liparis clypeolum Lindley var. *tahitensis*, new variety.

Sepals $7 \pm$ mm. in length, $2 \pm$ mm. in width; petals 7 mm. by 0.4 mm.; labellum $7.2 \pm$ by $7 \pm$ mm.; cusp $0.5 \pm$ mm.; pedicel and ovulary $9 \pm$ mm.; bracts $1 \pm$ mm.; capsule $12 \pm$ mm. in length, $5 \pm$ mm. in width; column 3 mm.; fruiting pedicel $7 \pm$ mm.

Tahiti, June 28, 1927, L. H. MacDaniels, no. 1726 (Papara, altitude 400 meters), type; no. 1493 (south side of Orohena, altitude 1600 meters, on moist soil, in shade, May 16, 1927), reference type. Tahiti, Mount Aorai Trail, altitude 1848 meters on moss-covered, inclined trunks of trees, September 23, 1921, E. H. Quayle, no. 48, reference type.

Endemic to Society Islands, on trees and moist substrata, at altitudes of 400 to 1848 meters.

Liparis revoluta Hooker and Arnott.

Original description amplified by Forest B. H. Brown:

Epiphytic, herbaceous, 8-25 + cm. in height; pseudobulb ovoid, $1.5 \pm$ cm. long, single or 2-6 + in a cluster; a single leaf blade, elliptical lanceolate in outline, 5-10 + cm. in length, 5-10 + mm. in width, acute, glabrous, commonly 10-veined, constricted at the base and articulate with the apical node of the pseudobulb, deciduous soon after maturity of the capsules; other leaves reduced to acute sheathing scales, 3 + in number, 2-15 + mm. in length, arti-

culate with the base of the pseudobulb, deciduous soon after maturity of the capsules; other leaves reduced to acute sheathing scales, 3 or more in number, 2-15 + mm. in length, articulate with the base of the pseudobulb, deciduous; scape terminal, 10 ± cm. compressed, commonly 2-alate, bearing 5-20 + flowers in the upper third portion and 3 ± triangular setose bracts of 5-12 mm. in the lower two-thirds; floriferous bracts triangular acuminate, mucronate, 2 ± mm. long; pedicel and ovulary nearly as long as the bract; flowers small, 4-5 mm. in diameter, light-yellow to greenish in color; sepals broadly oblong lanceolate, acute, 2 ± mm. in length, 1 ± mm. in width, the lateral ones relatively broad; petals narrowly linear, as long as the sepals, reflexed; labellum equal to the sepals in length and somewhat broader, acute, the basal sides rolled upward clasping the column; column subcylindrical, 1 ± mm. in length, with 2 short auricles at the end; anther subcircular, operculate; capsule broadly obovate, 3 ± mm. long, 2.5 ± mm. broad, somewhat compressed, 6-costate; fruiting pedicel 1-2 + mm.

Allied to the more primitive *Liparis savaiiensis* of Samoa and the Indo-Malayan *Liparis longipes*. It is not improbable that the specimen without flowers from Tahiti, doubtfully referred to *Bulbophyllum* by Cheeseman (Manual of New Zealand flora, p. 207, 1925), may prove to be a form of *Liparis revoluta*. Not collected in the Marquesas.

MICROSTYLIS Nuttall

Microstylis resupinata (Forster) Drake (fig. 6).

Original description amplified by Forest B. H. Brown:

Plant 50 ± cm. in height; leaves 4 ± in number, attached to the lower portion of the stem, the blades broadly elliptical in outline, 5-20 cm. in length, 4-8 + cm. in width, acuminate, tapering to a sheathing petiole-like base of 10 ± cm., glabrous, thin, with 5 ± prominent longitudinal veins and numerous small interstitial ones; scape terminal, longer than the leaves, up to 50 + cm. in height, glabrous with 3 ± acute bracts of 9 ± mm. in the lower portion; floriferous bracts lanceolate, acute, 5 ± mm.; flowers, small, purple in color, with yellow shading, 10-20 + in number; pedicel and ovulary 5-7 + mm.; lateral sepals broadly elliptical, obtuse, 4 ± mm. in length, 3 ± mm. in width, faintly 3-veined, light-yellow in color shaded with purple; third sepal relatively narrow, elliptical, acute, 4 mm. x 2 mm., 3-veined, light-yellow in color shading to purple; petals linear, 5 mm. x 1 mm., yellowish-white tinged with purple, faintly 3-veined; labellum suborbicular in outline when spread flat, the column central in position, 5 ± mm. broad, 6-7 + mm. long, purple shading to light-yellow in the auricles, glabrous, with 8-12 lacinate teeth in the apical portion, the 2 auricles forming the posterior semicircular portion, separated by a narrow sinus extending to the base of attachment at the foot of the column; column very short, 1.2 ± mm. in length, thick, with 2 projecting arms at the end; anther subcircular in outline, operculate, subterminal; fruiting pedicel 1-5 mm.; capsule obovoid, 10-20 mm. in length, 5 ± mm. in width.

Tahiti, May and June, 1927, L. H. MacDaniels, no. 1299 (Vahira Valley, altitude 200 meters), nos 1586 and 1586 A-C (Pueu, altitude

300 meters), nos. 1645 and 1645 A-D (Teahupo district, Maire Valley), no. 1705 (Taii Valley, altitude 275 meters), no. 1733 (Papara, altitude 450 meters), no. 1734 (Papara, altitude 350 meters), reference types. Tahiti, Fautaua, July 28, 1922, E. H. Quayle, nos. 612 and 612A, reference types.

The labellum is not quite constant in form even in flowers from the same plant, the number of lacinae tending to vary in number from 8-10 or from 10-12, and the relative length of the central pair of lacinae differs. However, in the specimens examined, the number of which is given above, the labellum in some specimens tends to be relatively narrow, with 10-12 lacinae, the central pair of which are relatively short and more or less connate. In others, the labellum tends to be more nearly suborbicular in outline, the lacinae fewer in number (8-10), with the central pair long and free.

Endemic to Society Islands at altitudes of 200 to 450 meters, rarely 70 meters.

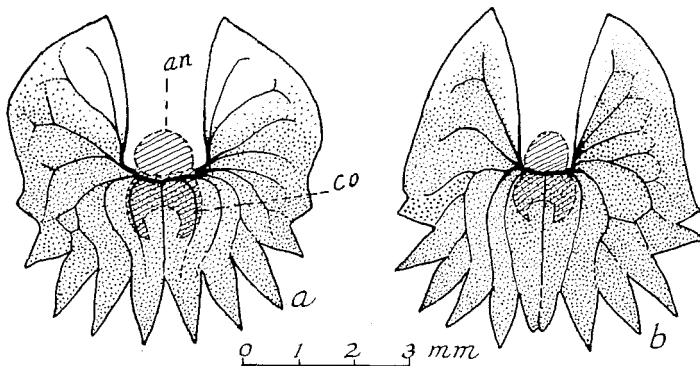


FIGURE 6.—Features of *Microstylis resupinata*: a, labellum, wide form; b, labellum, narrow form (an, position of anther; co, position of column).