

## Noteworthy Micronesian Plants. 5<sup>1</sup>.

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**Abstract**—Precursory taxonomic and nomenclatural notes to the check-list of Micronesian monocotyledons and to certain parts of the Flora of Micronesia, containing studies of Micronesian species of *Crinum* (Liliaceae: Amaryllidaceae)—*Crinum asiaticum* var. *pedunculatum* new combination; *Dianella* (Liliaceae)—*Dianella saffordiana* new species; *Dioscorea* (Dioscoreaceae)—*Dioscorea esculenta* var. *tiliaefolia* new combination; *Curcuma* (Zingiberaceae); *Didymoplexis* (Orchidaceae); *Liparis* (Orchidaceae)—*Liparis yamadae* new combination; *Habenaria* (Orchidaceae)—*Habenaria setifera* new combination; *Malaxis* (Orchidaceae)—*Malaxis calcarea*, *M. kerstingiana*, *M. trukensis*, *M. volkensis*, new combinations; *Nervilia* (Orchidaceae); *Spathoglottis* (Orchidaceae); *Rhynchophreatia* (Orchidaceae)—*Rhynchophreatia pacifica*, *R. carolinensis*, new combinations; *Taeniophyllum* (Orchidaceae); and *Trachoma* (Orchidaceae). Preliminary keys to the Micronesian species of several of these genera are provided, and specimens are cited.

The fifth paper of this series contains taxonomic and nomenclatural studies of *Crinum* and *Dianella* (Liliaceae, sensu latissimo), *Dioscorea* (Dioscoreaceae), *Curcuma* (Zingiberaceae), and *Didymoplexis*, *Liparis*, *Habenaria*, *Malaxis*, *Nervilia*, *Spathoglottis*, *Taeniophyllum* and *Trachoma* (all Orchidaceae), with a new species in *Dianella*, and new nomenclatural combinations in *Crinum*, *Habenaria*, *Liparis*, *Malaxis*. These studies are preliminary to the third part, Monocotyledonae, of our Geographical Checklist of Micronesian vascular plants (Fosberg, Sachet and Oliver 1979, 1982).

### A NEW COMBINATION IN CRINUM (LILIACEAE S.L. INCL. AMARYLLIDACEAE)

***Crinum asiaticum* var. *pedunculatum*** (R. Br.) Fosberg and Sachet, n. comb. *Crinum pedunculatum* R. Br., Prodr. 297, 1810.

Brown's *C. pedunculatum*, from his brief description, differs from *C. asiaticum* L. mainly in having the pedicels longer than the ovaries. Some Micronesian collections show this feature, but it is an extremely variable character and certainly warrants no more than varietal distinction.

It is probable that most or all of the large *Crinum*s of this relationship are only cultivated derivations of the small (ca 0.5 m tall) white-flowered wild coastal plant of eastern Asia and neighboring islands. We are for the time-being accepting forms with anthers 2.5–3.5 cm long before dehiscence as specifically distinct. Such are *Crinum bakeri*

<sup>1</sup>Previous papers in this series appeared in *Micronesica* 11: 77–80, 81–84, 1975; 16: 189–200, 201–210, 1980.

K. Schum. and *Crinum macrantherum* Engler (*C. rumphii* Merr.). These conclusions may be modified if we should be able to study a large number of the cultivated plants growing under uniform conditions. We are not sure of the identity of *Crinum augustum* [Roxb.?] as used by Overy, Polunin and Wimblett, P1. Kiribati, ill. 8, 1982. It may probably be what we are calling *C. asiaticum* var. *procerum* (Carey) Baker (*Crinum amabile* J. Donn), but it could be *C. macrantherum*, if the anthers are 25 mm long or longer.

#### A NEW DIANELLA FROM GUAM (LILIACEAE S. L.)

***Dianella saffordiana*** Fosberg and Sachet, n. sp.

*Dianella ensifolia* sensu auct. Guam, non (L.) DC. in Red., Lil. t. 1, 1802

*Dianella odorata* sensu Schlittler, 1957 non B1. 1827 (nom-superfl. illegit.)

Planta caespitosa; folia linearia marginibus laevibus (vel raro vix serrulatis); panícula pedunculata, pedunculo bracteato, vix ramoso, ramis racemiformibus cum pseudo-umbellis paucifloribus, pedicellis arcuatis inaequalibus maxime 10–15 mm; flores albi tepalis ovato-oblongis mucronulatis; fructus globosus albus, seminibus nigris nitidis obovoideis non angulatis.

Plant loosely caespitose, branched at base from condensed prostrate rhizomes, stems 30–60 cm tall (or long); leaves with linear-lanceolate or slightly broader blades 12–20 cm long, 10–15 mm wide, acute but tips slightly cucullate and often split, at least when dried, margins and midrib smooth or almost so, veins somewhat varied in strength and closeness but not in distinct orders of prominence, blades reduced on sheaths at lower nodes, sheaths mostly 6–8 cm long, closely folded around stems, obscurely distinct from blades; panicle (2)–6–10(–15) cm long, 2–5 cm wide, well-exserted on peduncles that have, usually, 2(–3) nodes bearing leaf-like bracts reduced upward into the panicle, this consisting of a main rhachis frequently with 2–3 strongly ascending branches, each with a narrowly racemose arrangement of sessile or usually pedunculate condensed or fasciculiform racemes or umbellules, these relatively few-flowered, often arranged along one side of the branch and somewhat arcuate or nodding; pedicels filiform, strongly arcuate, very unequal, the longer ones up to 10–15 mm, articulate at summit to receptacle, each pedicel clasped at base by a broadly ovate-cordate brownish-scarious bractlet 2–3 mm long with several strong parallel veins, these bracts longer than their subtended rhachis internodes, thus overlapping; tepals ovate-oblong, minutely mucronulate, white or whitish, outer with 7 nerves, inner with 5, margins thin, white, wider on inner series; filaments thickened at summit, anthers yellow with black tips; fruit subglobose or globose to depressed globose, 3-celled, pea-like, 5–7 mm diameter, fleshy, white when ripe; seeds 1–6, usually 4–5, black, glossy, slightly irregularly obvoid, not at all angular; about 3×2×1.5 mm, hilum orbicular, small, on narrow side of seed, about 1/4 the distance from end.

Differs from *D. carolinensis* Lauterb, in smooth leaf margins, leaves with veins not in definite orders of prominence, racemes condensed to umbellules, strongly arcuate pedicels rarely more than 7, up to 10–15 mm long, tepals larger, oblong-ovate.

Relationship between species in *Dianella* are not easy to suggest, as all species look much alike. Totally different characters have been used by different authors to separate the

species. The distinctive inflorescence of *D. saffordiana* shows up elsewhere, to our knowledge, only in a specimen, *C. B. Robinson 505* (US), from Amboina referred to *D. odorata* B1. (nom. illegit.). This specimen we have not placed but it probably does not belong with *D. saffordiana*.

Apparently endemic in the Marianas and confined to savannas on weathered volcanic soils. Definitely known only from Guam. A fossil, probably belonging to this genus, reported from Pagan, Northern Marianas (Fosberg and Corwin 1958) as *Dianella ensifolia*, in all likelihood belongs to *D. saffordiana*. The specimen of *McGregor 523* in US was in a cover marked "*Dianella saffordiana*, very smooth", with drawings on the sheet, and with no indication of an author. We can find no evidence that this was ever published. We are publishing the name in recognition of Safford's notable contribution to our knowledge of the Guam flora.

MARIANA ISLANDS: Guam: Savanna above Santa Rosa, *Moran 4377* (US, UC); hills back of Piti, *McGregor 523* (US); Mt. Alutom, east of Sumay, 350 m, July 1, 1946, *Fosberg 25297* (US, holotype, isotype, BISH, BRI, MO, K, isotypes); Mt. Alutom, headw. of Pago River, *Fosberg 35198* (US, BISH); Mt. Alutom, *Fosberg 59608* (US, BISH, GUAM); *Hosaka 3081* (US, BISH); S of Asan Point, *Anderson 60* (US, A, GUAM, MO); Mt. Tenjo and Mt. Reconnaissance area, 3 mi SW of Agaña, 1000 ft., *G. C. Moore 57* (US); Mt. Tenjo, *Rodin 525* (US); trail to Tarzan Falls, near Cross Island Road, near E. Observation Tower, Cotal, *Fosberg 59792* (US, BISH, POM, BM, BRI, PH); Cotal Conservation Area, on Cross Island Road, 100–130 m, *Sachet 1712* (US, BISH, P); Manengon, 150 m, *Evans 1779* (US, BISH, POM, MO, K, NSW, PH, A, B); Manengon, W of upper Ylig River, *Stone 4209-a* (GUAM); E of Apra Heights, *Fosberg 38638* (US, BISH, POM). Between Ylig and Sigua Valleys, 400 ft., *Steere 41* (US); Facpi Point, approach to Mt. Lamlan, 100 m, *Gregory & Necker 384* (US); Umatac, ridge SE of town, 60–70 m, *Anderson 277* (US, BISH, POM, NY); S–SE of Umatac, 80–100 m, *Fosberg 35435* (US, BISH).

#### DIOSCOREA L. IN MICRONESIA (DIOSCOREACEAE)

The genus *Dioscorea* L. is represented in Micronesia by six species, all but one widespread and very possibly brought by aboriginal people. One species, *D. ledermannii* Knuth, is endemic, but very close to the Philippine and Bornean *D. flabellifolia* Prain and Burkill. The others are *D. alata* L., *D. bulbifera* L., *D. esculenta* (Lour.) Burkill, *D. nummularia* Lam., and *D. pentaphylla* L. Of *D. esculenta* there are two varieties, *D. esculenta* var. *esculenta* and *D. esculenta* var. *tiliaefolia* (Kunth) Fosberg & Sachet, the latter possibly native but widespread at least as far as India. In addition to the above six, *D. hispida* Dennst. has been recorded as growing in a garden in Ponape (Barrau 1961 p. 45), and *D. latifolia* Benth. was tested for yield at the Guam Agricultural Experiment Station in 1925–1931. We have not seen specimens of the latter two species from Micronesia. *D. flabellifolia* was recorded from Ponape with the vernacular name "kapneil" (Nakao 1953), but we know nothing further of this record of a Philippine species. Plants from Palau reported as *D. flabellifolia* were later described as *D. ledermannii* Knuth, and we are accepting this disposition, concurred with by Prain and Burkill (1936).

Knuth described three other species from Micronesia, but Prain and Burkill (1936)

reduced them to already known species, *D. korrorensis* Knuth to *D. bulbifera* L., *D. palauensis* Knuth and *D. raymundii* Knuth both to *D. nummularia* Lam., with which reductions we concur.

Much of our material was examined in 1955 by Prof. Jacques Barrau, and we have in general accepted his determinations. Since most of the available specimens of Micronesian *Dioscorea* are sterile or very fragmentary, and since practically all of the species concerned are notably variable in their vegetative characters, determinations in this genus are mostly to be regarded as tentative and based more on aspect than on clear characters.

Experts on the genus, such as Burkill, attach importance to features of the tubers, but as tubers are seldom preserved, and as they seem to vary enormously, they are of little use for ordinary taxonomic purposes. They should, however, be photographed and described by collectors. A feature accepted by all writers as basic is whether the vines twine to the left or to the right. This is in some specimens very hard to determine. It would be a great help if collectors would observe and record this character from living material before it is cut up and dried.

A key to Micronesian species will not be attempted at this time but a few useful though not constant characters will be indicated for each species. Notes on nomenclature for several of the species will be placed on record, in order to show how we arrived at the names used.

The vernacular names of yams in Micronesia have been listed by Barrau (1961) and will not be repeated here.

*Dioscorea alata* L., Sp. Pl. 1033, 1753.

This species has "wings" or longitudinal flanges or sharp ridges on the stems which twine to the right; seldom or never has prickles; has thin opposite or alternate cordate to hastate leaves with a broad sinus, 5–9 nerves. It sometimes has aerial tubers. Its 3-winged fruit is large, to 3 cm wide. It is sometimes difficult to distinguish from *D. nummularia*, which does not have the cauline wings, and is usually at least somewhat prickly.

*D. alata* has at present a pan-tropical distribution, carried everywhere for its edible tubers. Said by Burkill (1951) to have originated in continental Asia, it was brought to the Pacific in pre-European times. It is known from most of the Marianas and Caroline islands.

*Dioscorea bulbifera*, L., Sp. Pl. 1033, 1753.

*Dioscorea korrorensis* Knuth, Pflr. iv-43: 190, 1924.

A coarse glabrous vine, twining to the left, not at all winged or prickly; leaves usually broadly cordate, with a U-shaped sinus, always alternate, rarely with herbaceous stipules, (7–) 9–15 (–17) nerves, almost always with roundish aerial tubers which are purplish, sometimes rather large, and bitter.

*D. bulbifera* is the most common and widely distributed wild species, seldom planted. It is native to the Old World tropics, especially in moist to wet regions; in Micronesia occasional in the Marianas, very common in the Carolines on most islands.

*Dioscorea esculenta* (Lour.) Burkill, Gard. Bull. Straits Settlements 1: 396, 1917.

*Oncus esculentus* Loureiro, Fl. cochinch. 1946, 1790.

*Dioscorea aculeata* L., in Diss. Stickm., Herb. Amb. 23, 1754, et auct. plur., non L., Sp. Pl. 1033, 1753.

*Dioscorea tiliaefolia* Knuth, Enum. 5: 401, 1850.

*Dioscorea sativa* L., Sp. Pl. 1033, 1753, pro parte, excl. lectotype.

*Dioscorea fasciculata* Roxb., Fl. Ind. 3: 801, 1832.

*Dioscorea papuana* Warb. as to Micronesian record.

A slender vine, twining to the left, not ribbed or alate, prickly or not, almost smooth to pubescent, leaves alternate, broadly cordate, sinus U shaped to very narrow, rarely with aerial tubers. Indo-Pacific, native in Indo-China. Two varieties occur in Micronesia.

*Dioscorea esculenta* (Lour.) Burkill var. *esculenta*

*Dioscorea fasciculata* Roxb., Fl. Ind. 3: 801, 1832.

*Dioscorea aculeata* var. *fasciculata* (Roxb.) Prain & Burkill, Jour. As. Soc. Bengal 10: 20, 1914.

*Dioscorea esculenta* var. *fasciculata* (Roxb.) Prain & Burkill ex Burkill, Fl. Males. I, 4: 308, 1951.

*Dioscorea fasciculata* var. *lutescens* F.-Vill. in Blanco, Fl. Fil. Gran Edicion [ed. 3], 4: 260, 1880.

This is the usually cultivated aspect of *D. esculenta*, which lacks the tangled mass of spiny branches at the base of the stem. The vines are, however, often somewhat to very prickly, at least near the base, and are generally almost glabrous. Except for the pubescence and prickliness, sterile specimens are not easily distinguished from the wild *D. bulbifera*.

Widespread in cultivation, this variety has been differentiated by human selection into numerous cultivars.

*Dioscorea esculenta* var. *tiliaefolia* (Kunth) Fosberg and Sachet, n. comb.

*Dioscorea tiliaefolia* Kunth, Enum. 5: 401, 1850.

*Dioscorea aculeata* var. *tiliaefolia* (Kunth) Prain & Burkill in Elmer, Leaf. Phil. Bot. 5: 1594, 1913.

*Dioscorea spinosa* Roxb. in Wall. Cat. 5103, 1828, nom. nud.; Hook. f., Fl. Brit. Ind. 6: 291, 1892. This is the first validation of Roxburgh's epithet, but as *D. tiliaefolia* Kunth and *D. lanata* Balf. are cited in synonymy, the name is superfluous and illegitimate.

*Dioscorea esculenta* var. *spinosa* (Roxb. ex Wall.) Knuth, Pflr. iv-43: 189, 1924; Ann. Bot. Bard. Calcutta 14(1): 85, 1936.

*Dioscorea spinosa* Roxb. ex Wall., the basionym of *D. esculenta* var. *spinosa* (Roxb. ex Wall.) Knuth, is definitely a nomen nudum, and therefore invalid and not available for transfer to *D. esculenta* at any rank. Its first valid publication, by Hooker f., is superfluous, as two earlier binomials are cited in synonymy. The next earlier epithet available for this taxon at varietal rank is furnished by *D. aculeata* var. *tiliaefolia* (Kunth) Pr. & Burk., based on *D. tiliaefolia* Kunth. To the best of our knowledge this has not previously been published.

This plant is an extensive vine, villous or arachnoid in most of its parts, with a tangled mass of wiry branches or roots armed with dangerous long hard sharp spines at the base of the stem at ground level. Its leaves are broadly orbicular cordate, with 9-13

nerves, shortly acuminate, usually more or less, often conspicuously, arachnoid beneath, with a deep sinus semi-circular at base. It is wild and very common on the southern half of Guam, also found on Yap in the Carolines and west to the Philippines, Indonesia and India. This is generally considered to be the wild form from which the numerous cultivars which form *D. esculenta* var. *esculenta* have been derived.

*D. esculenta* var. *fulvido-tomentosa* Knuth is of uncertain identity according to Prain & Burkill (1936) but the plants to which this name has been applied in Micronesia undoubtedly belong to var. *tiliaefolia*.

*Dioscorea hispida* Dennst., Schl. Hort. Malab. 15, 20, 33, 1818.

*Dioscorea triphylla* sensu L. 1754 et auct., non L., Sp. Pl. 1032, 1753.

This is a large vine, twining to the left, known in Micronesia only in cultivation. It has ample trifoliolate leaves and its oblong fruits are similar to those of *D. ledermannii*. The whole plant is highly poisonous, though the tubers are sometimes eaten (not in Micronesia) after a lengthy and laborious preparation to rid them of the poison.

In Micronesia it has only been observed in cultivation in Ponape, and may not have persisted.

*Dioscorea ledermannii* Knuth, Pflr. iv-43: 188, 1924.

*Dioscorea flabellifolia* sensu auct. Micr., non Prain and Burkill, Leaf. Phil. Bot. 5: 1593, 1913.

This species, endemic in Palau, is a coarse vine, twining to the left, glabrous and without spines or prickles; leaves alternate, large, to 13 × 10 cm, cordate, subcoriaceous, sinus broadly acute, deep, nerves 11; fruit oblong, almost twice as long as wide, racemose.

This species is very close to the Philippine *D. flabellifolia*, but differs in the fruit. It has apparently only been found twice. The type, *Ledermann* 14563, very likely lost in the Berlin bombing, was from Ngaskip /Babeldaob?/, collected in 1914. *Kanehira* collected it in Babeldaob, Aimieliik, 2316 (K, P, US) in 1933.

*Dioscorea nummularia* Lam., Encycl. Meth. 3: 231, 1789.

*Dioscorea raymundii* Knuth, Pflr. iv-43: 191, 1924.

*Dioscorea palauensis* Knuth, Pflr. iv-43: 191, 1924.

A slender vine, twining to the right, stem not at all winged, often very prickly near base, less so or not at all, distally, glabrous; leaves alternate or opposite, thin, usually longer than wide, or suborbicular, acuminate, (5-) 7-9 nerved, variable in outline and prickliness.

Widely cultivated for food. Found on all inhabited high islands. Doubtless an aboriginal introduction.

*Dioscorea pentaphylla* L., Sp. Pl. 1032, 1753.

This species is easily recognized among the Micronesian ones by its slender habit, twining to the left, and its digitately compound leaves which usually have 5, but occasionally 3 somewhat pubescent leaflets (*D. hispida* Dennst. has 3 leaflets also, but is a heavy coarse, glabrous vine), near lack of prickles, and large oblong fruit. It is very variable, and many varieties have been described.

It has an Indo-Pacific distribution and is thought by Burkill (1951) and St. John (1954) to be carried by man; in Micronesia known from Guam, Sonsorol, Palau, Yap and Ponape.

#### THE ROSE-BRACTED MICRONESIAN *CURCUMA* (ZINGIBERACEAE)

Much confusion has permeated what has been written on *Curcuma* as it occurs in Micronesia. The names usually applied are *Curcuma longa* L. and its synonym, *Curcuma domestica* Valetton, or rarely, *Curcuma zedoaria* (Christm.) Roscoe, misapplied to a wild Micronesian plant.

There are definitely at least two species spontaneous or in aboriginal cultivation in Micronesia. Glassman (1952, p. 106) mentions several varieties with native names and uses under *Curcuma domestica*, and goes on (p. 107) to mention briefly a *Curcuma* sp. with "flowers pink". Marjorie Falanruw said (pers. comm.) many years back, that there are three different curcumas on Yap with different shades of yellow in the flesh of the rhizomes. She has not yet sent us specimens of these.

The two entities which we know to exist are *C. longa* L., with whitish cream to greenish yellow bracts and *C. australasica* Hook. f. with bright rose-pink bracts. The latter is generally a much larger plant. The name *Curcuma longa* had been almost indiscriminately applied to both species, apparently under the assumption that there is only one species present. Usually there is no way to tell which species is meant, unless the rose or purple color of the inflorescence is mentioned, when it can be safely assumed that it is *C. australasica*.

We have been aware of the rose-bracted species almost since the beginning of our work on the Micronesian flora, but for some years thought it to be an undescribed taxon. Under this assumption a detailed description was prepared from a living collection made in Guam (*Fosberg 46289*). Drs. B. L. Burt and C. M. Smith, of the Edinburgh Royal Botanic Garden, were kind enough to confirm that our description fit *C. australasica* and to send their description of that species, which corresponded well enough, and was more professionally done, but not in as much detail. It seems worthwhile to put our description on record, since this plant has an unusually complex inflorescence and details are hard to visualize from dried specimens.

*Curcuma australasica* Hook. f., Bot. Mag. t. 5620, 1867.

Rhizomes thick, knobby, issuing from erect short corms, joints of rhizome constricted especially on upper side, growing horizontally for a few cm (5 cm in two examples, 3.5 cm in another), then turning sharply upward, the rhizomes about 2 cm thick, the corms 3–5 cm, rows of irregular more or less oblong tubers growing downward crowded on the lower sides of rhizomes and corms, these 2–4 cm long, 1–1.5 cm thick, blunt, with thin short scales or scars of scales, disposed transversally around rhizomes and tubers, cortex of rhizomes and corms about 5 mm thick, whitish, interior bright lemon yellow, with an acrid aromatic flavor, tubers similar, roots fleshy, about 6 mm thick, cortex translucent, about 1.5 mm thick, stele about 3 mm thick, white except for translucent pith less than 1 mm thick, these roots appearing anywhere on corm and later on rhizomes, growing downward; the rhizome system closely clumped and dense, producing terminally

many upright stems. Stems less than 1 cm thick, enclosed by 2–4 leaf-sheaths arranged distichously and overlapping in an equitant manner, lowest 1–3 are cataphylls with no blades, cross-section of pseudostem (stem & leaf-sheaths) elliptic, about 3 basal leaves emerging from the corm or rhizome on each side (in addition to cataphylls), sheaths of these leaves 30–40 cm long, with a very narrow hyaline ligule, its margin ciliate, petiole 4–15 cm long, lowest shortest, blades elliptic to oblong,  $25 \times 12$  to  $55 \times 20$  cm, somewhat decurrent at base, apex acute then abruptly narrowly acuminate, principal veins of larger leaves about 24 pairs, 4 successively smaller orders of veins between these, one of each between each two larger ones, finally just suggestions of a network, midvein thick, deeply channeled above, prominent beneath. Scape cylindrical, 50–51 cm tall to cauline bract, bract about 12 cm long, spathe-like, lower 7 cm closed, limb ovate, acute, peduncle above bract 9 cm long, inflorescence a strobile-like panicle about 20 cm long, and about 8 cm wide, flowers in cymules of 3–5 sessile flowers each, buds each enclosed in a boat-shaped hyaline membranous bract, the entire cymule subtended by a large somewhat spreading chartaceous bract, lowest of these broadly oval and extremely obtuse or rounded, green, becoming, upward, progressively longer, more ovate, more nearly acute, more purple, till the uppermost ones are narrowly oblong-ovate, rose-purple, each of these bracts with its sides connate to the backs of the two bracts above it, forming a strobile of deep pockets, each, except the 2 lowest, enclosing a cymule of flowers; flowering starting at bottom and progressing upward, but also flowers in each cymule opening successively, so that there may be unopened buds from bottom to top of the strobile, and many flowers open at once; uppermost cymules abortive; buds fusiform, somewhat bent and attenuate at tips, white; entire flower, at anthesis, about 5 cm long, calyx very thin and delicate, hyaline, 1 cm long, tubular, shallowly and irregularly 3-lobed, lobes somewhat carinate-plicate, with keel ciliate above, the three petals also hyaline, unequal, shortest about 3 cm long, longest about 4.5 cm, lower 2.5 cm completely united into a funnel-form tube, the free lobes broadly ovate, obtuse to (the longest) abruptly acuminate-cucullate, this hood-like acumen slightly flattened dorsiventrally, sparsely pilose; corolla tube adnate to the tubular-funnel-form staminode (if it is a staminode), this deeply 4-lobed, firm, yellow, especially the lower lobe distally, lower lobe or lip about equalling or slightly exceeding longest petal, semi-cylindric when expanded, its lower edge flaring slightly and revolute, two lateral lobes oblong somewhat unevenly rounded at apex, about equalling the lower, outer sides imbricate over and outside the lower lobe, inner sides somewhat connivent and forming a hood over the upper lobe, upper lobe (or stamen) narrower, ovate to oblong, shorter than the others, only about 6 mm long, or less, erect, bearing at apex a fleshy puberulent oblong anther, its body about 4 mm long, somewhat narrower and rounded or subtruncate distally, truncate at base, angles prolonged into 2 slender subulate horns about 3 mm long, the back rounded, ventral side with a broad groove, this filled with a white slimy or glue-like fluid (the pollen?), a narrow tube running the length of the anther through which the filiform style extends, ending in an abruptly expanded stigma with two connate lips, the inner more or less flat, minutely ciliolate, the upper doubly cucullate, its sides united with the lower lip, forming a mouth-like pouch (ventral groove of the anther not united but merely connivent, so that the tube is a deepening of this groove), ovary minute, with 3 tiny erect ovules.

This seems to be related to *C. purpurascens* Bl. and its several ill-defined relatives,



but differs in having the inner part of the rhizome lemon yellow (rather than orange yellow), the upper inflorescence bracts not mucronate, rose-purple rather than greenish to white with purple dots, the flowers definitely not exserted beyond the bracts, labellum not bifid. Neither the leaves nor the bracts seem to be ciliate.

We have many collections of this species (*C. australasica*), listed below. It seems much commoner in Micronesia than the less conspicuous *C. longa*, the turmeric of wide use as a spice or ingredient of curry. Native names and uses recorded in the literature as pertaining to *C. longa* or *C. domestica* in Micronesia, may, in some cases, belong with *C. australasica*, but it is difficult to be sure. Hence we are only citing such data when we can associate them with actual specimens. These notes are incorporated in the list of specimens examined, below.

The type locality of this species is Cape York, Queensland, Australia. Specimens examined:

MARIANAS ISLANDS: Anatahan I.: NW corner, *Falanruw 1642* (US), *1713* (US). Guam: Mangilao, *Stone 4164* (US, GUAM); s. l. *Stone 4395* (GUAM); S. tributaries of Maulap River, 100 m, *Fosberg 59811* (US, BISH); W of Inarajan, *Cushing 66* (US); 75 m, *Fosberg 46289* (US, BISH, POM, NY, E, L).

CAROLINE ISLANDS: Palau: Ogiwaru, *Takamatsu 1447* (BISH). Sonsorol Atoll: *Berry 102* (US), (n.v. Yangoriyepe), *106* (US). Yap I.: s. l. *Kanehira 1128* (FU); Tomil, *Hosaka 3256* (US); near Rumu village, *Cushing and Fanoway 400* (US) (n.v. guchol or guchol ni rang); Malai village, 10 m, *Cushing and Malai children 522* (US) (n.v. guchol ni rumung). Woleai Atoll, Falulis I., *Alkire 18* (US), *26* (US) (n.v. uish; bulb used in medicine, leaves in magic). Truk Group: s. l. *Pelzer 5* (US, BISH) (n.v. afan), *83* (US, BISH) (n.v. ongin); Tol, *Wong 252* (US, BISH) (n.v. ongin); Moen, 35 m, *Anderson 756* (US, BISH) (n.v. aungin); *Takamatsu 229* (BISH); Dublon, *Takamatsu 278* (BISH); Tol, Fason village, lower E slope Mt. Tunitol (Uiniboet), *Fosberg 24472* (US, BISH). Lukunor Atoll, Oneap I., *Anderson 2121* (US, BISH) (n.v. afan). Satawan Atoll, Ta I., *Anderson 1067* (US, BISH, POM, NY, L) (n.v. afan). Ponape: s. l. *Riesenberg 37* (BISH) (n.v. au'long); U Distr., bet. Ipuak and U, 1–5 m, *Fosberg 26356* (US) (n.v. aulong), *25336* (US, BISH) (n.v. ongalap); Matalanim Distr., Nanmatal I., 1–3 m, *Fosberg 26389* (US, BISH, POM, NY) (n.v. aulong); vic. Ronkiti, 200 ft., *Glassman 2461* (US) (aulong); s. l. *Kanehira 685* (FU); Nanpil River, below reservoir, *Fosberg and Falanruw 58400* (US, BISH); E coast, Majyö, *Fosberg 58486* (US, BISH) (n.v. aulong, used for coloring). Kusaie (Kosrae): s. l. *Glassman 2684* (BISH); Mt. Faming, *Takamatsu 543* (UC, BISH); along Innem River, *Stemmermann 2852* (BISH); Lele I., 15 m, *Wong 70* (US); Utwa, Yewal, *Falanruw 3544* (US).

#### DIDYMOPLEXIS IN MICRONESIA (ORCHIDACEAE)

*Didymoplexis* Griff., *Calcutta Jour. Nat. Hist.* 4: 383, 1844.

This is a genus of about 20 species of leafless saprophytic orchids, characterized by having the two lateral petals at least partly adnate to the upper sepal, this combined structure apically somewhat curved over the end of the column, lateral sepals partly connate, pollinia two. The underground stem or rhizome is horizontal and tuberous, at least in the Micronesian species, and buried in the humus in dense forest habitats. The genus is found

from East Africa and Madagascar to Samoa and north to Saipan, with two poorly distinguished species in Micronesia. *Didymoplexis fimbriata* Schltr. has been considered endemic to Palau, where it has now been collected several times, on three different islands. Here we extend its distribution to Saipan, Tinian, Rota, and Guam in the Marianas, and possibly to Yap, in the Carolines. The plants are so small and inconspicuous that they may be frequently overlooked. We have not seen material of *D. trukensis* Tuyama, but are maintaining it on the basis of the description of its very broad labellum which rather suggests *D. pallens* of eastern Asia. More material may show that it is too close to *D. fimbriata* Schltr. Because the genus has been previously collected only three times in Micronesia, and because its distribution is here extended, we are placing our observations on record.

We had assumed that the plants found in the Marianas represented a different species, but with several collections available no consistent differences from *D. fimbriata* were found. M. C. Falanruw (pers. comm.) reports having collected plants of this genus on Yap, but the specimens cannot be found. It seems likely that they are also *D. fimbriata*.

*Didymoplexis fimbriata* Schltr., Bot. Jahrb. 46: 449, 1921; Kanehira, Enum. Micr. Pl., 297, 1935; Tuyama, Bot. Mag. Tokyo 54: 267, 1940. Type from Palau, Babeldaob, Ledermann 14572, not seen by us, probably destroyed.

Description of Marianas plants: Stem erect or somewhat decumbent, 5–17 cm high, white, or bronzed, reddish, or “cinnamon brown”, from a prostrate tuberous rhizome, usually ellipsoid or fusiform and 2–3 × 0.5 cm, rarely several connected end to end, but may be (in *no.* 6883) elongate to 7 cm; enlarging distally to 0.7 cm, then tapering sharply, surface when dry prominently irregularly wrinkled, base of stem 3–10 mm above tuber bearing a number of elongate flexuous horizontal stolons?, roots? or “propagations” (Tuyama) up to 5–8 cm long, stem bearing several scales or “vaginulae”; raceme becoming rather loose, rachis eventually reaching up to 4.5 cm, bearing 1–11 pedicels 10–12 mm long at anthesis, elongating to 8–13 cm in fruit, subtended by persistent deltoid to ovate, scale-like bracts; ovary linear, 5–10 mm long, flower above ovary 6–6.5 mm long when dry, white or dull reddish, labellum white or red-orange, 6 mm long, 3 mm wide near apex, cuneate-obovate or oblong, apically subtruncate, distal margin fimbriate or at least erose, with 5 nerves, 3 middle ones glandular puberulent, uniting just back of apex into a curved glandular band; column 6 mm long, gradually enlarged distally, apex 2 mm wide, rostellum and stigma very slightly emarginate; fruit about 15 mm long, ellipsoid to obovoid even after dehiscence, then composed of six arcuate strips connected at apex, retaining and held together by persistent dried flower.

Growing on limestone except for Babeldaob records, which are probably from weathered volcanic soil.

MARIANAS ISLANDS: Saipan: Sabanan Hagman, 60 m, *Herbst & Falanruw 6883* (US). Tinian: W of Lasu Shrine, below Mt. Lasu, *Fosberg 64462* (US, BISH, POM, K), plant and flowers white; *64489* (US, BISH, A), plant reddish, flowers pinkish; *64534* (US), plant reddish, flowers pinkish; 0.5 km E of main highway, just W of Bañaderon Lemmai, 75 m, *Fosberg 64503* (US, BISH), plants reddish, flowers pinkish; *64504* (US, BISH, MO), plant and flowers white. Rota: mid-northern part of island, *Falanruw, Aguon*

& *Herbst* 3802, 3804, 3805, 3810, 3811, 3815, 3819, 3820, 3821 (all US). Guam: 1/2 mile S of Mt. Santa Rosa, *G. C. Moore* 389 (US); in forest behind College of Guam [Mangilao], *Cushing-Falanruw* 841 (US, GUAM).

CAROLINE ISLANDS: Palau: Babeldaob, Taizo, Ngiwal Mun., 5 m, *Canfield* 511 (US); Urukthapel, E. coast of N. peninsula, 2 m, *Fosberg* 32496 (US). Recorded also from Angaur I. by Tuyama (1940, p. 267). The type, Ledermann 14572, from Babeldaob was probably lost in the bombing of Berlin. Yap Island material found by Falanruw, which we have not seen, may belong here.

*Didymoplexis trukensis* Tuyama, Journ. Jap. Bot. 17: 515–516, 1941.

We have seen no material of this species. The type and only collection was made on Truk, Trowasi I. (Natusima or Dublon) by Okabe and Tuyama, Feb. 1, 1941, and is in TI.

It seems very close to *D. fimbriata* but on the basis of the details of the flower, broad labellum, etc. as described and illustrated by Tuyama, we are maintaining it at least until new material is available.

#### TRANSFER OF CESTICHIS YAMADAE TUYAMA TO LIPARIS L. C. RICH. (ORCHIDACEAE)

We are following Schlechter (1911, 1982) in uniting *Cestichis* Thou. (*Coestichis* Thou.) with *Liparis* L. C. Rich. We discuss the problem of pre-1953 alternative names which are not accepted by their authors.

*Cestichis yamadae* Tuyama was published, with a proper description and citation of specimens. *Liparis yamadae* Tuyama, not previously published, was cited in synonymy but with the statement that it is an alternative name.

According to Art. 34.4 one might assume that *Liparis yamadae* was validly published, since this was prior to 1 January 1953, the final date for validity of alternative names. However, on two counts it may be considered invalid according to 34.1.(a) as it was not accepted by its author, who was using the generic name *Cestichis* throughout his article, and 34.1.(d) as it was cited as a synonym, though perhaps not "merely cited as a synonym" since there was the qualification that it was an alternative name. It seems to us that to qualify as an acceptable alternative name it either must be used by the author or he must have specifically stated that he accepts both names. Otherwise, Article 34 is internally inconsistent. Hence, we regard *Liparis yamadae* Tuyama as not validly published and non-existent, nomenclaturally. Since we have no difficulty recognizing two collections as distinct from *L. dolichostachya* Fukuyama at least superficially, by the slender rhachis and narrow perianth parts, and Tuyama has given convincing technical characters, we are hereby transferring *Cestichis yamadae* to *Liparis*. *Cestichis* is generally not maintained as a distinct genus.

*Liparis yamadae* (Tuyama) Fosberg & Sachet, n. comb.

*Cestichis yamadae* Tuyama, Bot. Mag. (Tokyo) 54: 265, Pl. II, 1940.

This species is endemic to Palau, where it is an epiphyte found on several islands in moist to wet habitats.

CAROLINE ISLANDS: Palau: Babeldaob I., Airai waterfalls, 10 m, *Canfield 273* (US); Koror I., type, Yamada in 1925 (TI), not seen by us. Ngarakabesang (Arakabesan) I., *Takamatsu 1242* (BISH). Aulupse'el I., Ngerebe'ed Beach, 2–10 m, *Evans 593* (US).

#### TRANSFER OF PERISTYLUS SETIFER TUYAMA TO HABENARIA (ORCHIDACEAE)

*Habenaria setifera* (Tuyama) Fosberg & Sachet, n. comb.

*Peristylus setifer* Tuyama, Bot. Mag. Tokyo 54: 276, 1940.

This species, known only from Yap, was described in the segregate genus *Peristylus* accepted by some orchidologists. We are following Holttum (1964) and Schlechter (1911, 1982) in retaining *Peristylus* B1. in *Habenaria* Willd.

As with *Liparis yamadae* discussed above, the name *Habenaria setifera* Tuyama is invalid, as it was not accepted by its author, even though he did call it a *nomen alternativum*, which would have been valid (prior to 1953) if he had used it, rather than only citing it in synonymy.

#### TRANSFER OF MICRONESIAN MICROSTYLIS TO MALAXIS (ORCHIDACEAE)

Most modern writers treating Orchidaceae (e.g. Schweinfurth 1936; Backer 1968; Garay & Sweet 1974; Holttum, 1964) combine *Microstylis* Nuttall with *Malaxis* Solander ex Swartz. All but one of the seven Micronesian species of this combined genus were described by Schlechter (1921), the remaining one by Fukuyama (1938), both of whom accepted the genus *Microstylis*. We have been able only to take a cursory look at the group as a whole but find nothing, at least superficially, to support separation of two genera.

The type specimens of all but one of Schlechter's species were apparently lost in the bombing of Berlin. One sheet of one syntype of *Microstylis setipes* Schltr. remains, which we have examined (B). Several of Schlechter's species seem very close, but we hesitate to combine them on the basis of the scanty material available, and in the absence of the types. We have not seen Kanehira 1290, type of *Microstylis trukensis* Fukuyama. Comparison of the description of *M. kerstingianus* Schltr. and *M. trukensis* Fuk. reveals very little difference, indeed. However, examination of Palau and Truk material, both determined as *M. kerstingianus* by Paul Kores, suggests that they are not identical and we are not inclined to combine them until Fukuyama's type can be examined and compared with our material.

We are making the necessary transfers to *Malaxis* to have the names available for the geographical checklist, but urge that more specimens be collected on both Palau and Truk, and that all the *Malaxis* from the western Carolines be critically examined. Ample notes on floral details and color patterns from fresh material would be desirable.

Since two combinations for Palau species were made incidentally by Schweinfurth (1936) in an unexpected place, they are listed here, also.

*Malaxis* Solander ex Swartz, Prodr. 8: 119, 1788.

*Microstylis* (Nuttall) Eaton, Man. Bot., ed. 3, 115, 347, 353, 1822.

*Malaxis calcarea* (Schltr.) Fosberg & Sachet, n. comb.

- Microstylis calcarea* Schltr., Bot. Jahrb. 56: 460, 1921.  
CAROLINE ISLANDS: Palau, limestone islands.
- Malaxis kerstingiana* (Schltr.) Fosberg & Sachet, n. comb.  
*Microstylis kerstingiana* Schltr., Bot. Jahrb. 56: 461, 1921.  
CAROLINE ISLANDS: Palau, Babeldaob; possibly Truk.
- Malaxis palawensis* (Schltr.) Schweinfurth, Bish. Mus. Bull. 141: 23, 1936.  
*Microstylis palawensis* Schltr., Bot. Jahrb. 56: 459, 1921.  
CAROLINE ISLANDS: Palau, Babeldaob.
- Malaxis setipes* (Schltr.) Schweinfurth, Bish. Mus. Bull. 141: 22, 1936.  
*Microstylis setipes* Schltr., Bot. Jahrb. 56: 462, 1921.  
CAROLINE ISLANDS: Palau, Babeldaob, Koror, Malakal.
- Malaxis trukensis* (Fukuyama) Fosberg & Sachet, n. comb.  
*Microstylis trukensis* Fukuyama, Tr. Nat. Hist. Soc. Formosa 28: 415, 1938.  
CAROLINE ISLANDS: Truk, Tol, Moen, Dublon.
- Malaxis volkensis* (Schltr.) Fosberg & Sachet, n. comb.  
*Microstylis volkensis* Schltr., Bot. Jahrb. 56: 459, 1921.  
*Microstylis wallichii* sensu Volkens, non Lindley  
CAROLINE ISLANDS: Yap, possibly Palau.

#### MICRONESIAN NERVILIA (ORCHIDACEAE)

Four sterile collections of *Nervilia* from Guam and one from Yap that we earlier referred with doubt to *N. aragoana* now seem clearly not to belong to that species. Doubt was expressed about two of these collections by E. H. Walker, and about one by Ch. Schweinfurth many years ago (annotations on herbarium sheets). Paul Kores recently annotated the same two collections as possibly *N. platychila* Schltr., a New Caledonia species. Careful examination of our unmounted Micronesian specimens of this genus revealed three more similar collections.

These five collections differ from the widespread *N. aragoana* in leaf-shape, number of nerves and their nature, length of petiole, and pubescent vs. glabrous upper leaf surface. These differences are brought out in the detailed comparison below.

Gaudichaud, when he described *N. aragoana* from Guam, also described very briefly *N. ovata*, from Rota, the island next northward from Guam in the Marianas. This species has never been recollected, nor has Gaudichaud's Rota specimen been located. The description is quite inadequate to identify *N. ovata* with any known species. Schlechter (1921) even suggested that *N. ovata* might not even belong in *Nervilia*.

Phillip Moore (pers. comm.) observed that there seemed to be two *Nervilia* species on Guam, one with a long petiole, holding the blade well above the ground, the other with the blade practically at ground level. At our request he collected excellent material of the first of these, but failed to relocate that with the short petiole. His collection of the long-petioled one is the principal basis for our description, below, of *N. aragoana* Gaud.

Our attempt to place the species represented by the five doubtful collections mentioned above led to a reexamination of the Micronesian species of this genus. These seem to be four well-marked species in Micronesia, for which several names have been proposed.

The original species of the genus, *Nervilia aragoana* Gaud., was described first from

Guam and has been found widespread in the Pacific, from the northern Marianas to Palau, the Ryukyu Is., Malaya, India, Malay Archipelago, New Caledonia, and eastward to the Society Islands and Tuamotus (Takapoto, Tikehau).

A second widespread species, probably correctly called *Nervilia platychila* Schltr., discussed above, is found at least from Guam to Yap and Palau, and south to Fiji and New Caledonia.

*Nervilia palawensis* Schltr. and *Nervilia trichophylla* Fuk. are, so far as known, endemics in Palau and Yap.

**Nervilia** Commerson ex Gaud., Bot. Voy. Uranie t. 35, 1826; *ibid.* 421, 1829. Schlechter, Bot. Jahrb. 56: 446–447, 1921. Stone, *Micronesica* 6:160, 1971. Hallé, Fl. Nouv. Caléd. 8: 410, 1982.

Terrestrial herbs with subterranean tuberous pseudobulb, producing fibrous roots and a short stem bearing a single petiolate leaf, this cordate and palmately veined; an erect scape, appears after leaf has withered, 1–15 flowered, sepals and petals similar, narrow, labellum not spurred, 3-lobed or entire, clasping column at base; capsule splitting but valves coherent at apex.

An Afro-Indo-Pacific genus of 40 or more species, 4 in Micronesia.

The following key will separate the Micronesian species.

1. Leaves glabrous on upper surface . . . . . 2
  2. Leaves with many palmately arranged nerves, blade not at all angulate, scape with 5–13 (–15?) flowers . . . . . *N. aragoana*
  2. Leaves with 7 palmately arranged nerves, blade obscurely angulate, stem above tuber rhizome-like in lower part, stem-like, of several internodes above, scape uniflorous . . . . . *N. palawensis*
1. Leaves sparsely hairy above or beneath . . . . . 3
  3. Leaf-blade not at all or scarcely angulate, ovate-orbicular, scape with (1–) 2 (–3) flowers . . . . . *N. platychila*
  3. Leaf-blade obscurely 7-angled, reniform, scape uniflorous *N. trichophylla*

**Nervilia aragoana** Gaud., Bot. Voy. Uranie t. 35, 1826; *ibid.* 422, 1829; Safford, Contr. U.S. Nat. Herb. 9: 331, 1905; Walker and Rodin, Contr. U.S. Nat. Herb. 30: 498, 1943; Tuyama, Bot. Mag. (Tokyo) 54: 274, 1940.

*Pogonia flabelliformis* Lindl., Gen. Sp. Orch. 415, 1840.

*Pogonia nervilia* Bl., Mus. Bat. Lugd. Bot. 1: 32, 1849.

Rhizome slender, prostrate, bearing irregular firm to soft fleshy pseudobulb, producing a short stem with a single petiolate reniform-cordate horizontal leaf, glabrous, about 10 × 14 cm, sinus broadly rounded, veins 23–29, alternate ones prominent above and below; scape appearing on a very short slender stalk from apex of pseudobulb, erect, bearing up to 5 cauline bracts or bladeless sheaths clasping stem, then membranous narrowly lanceolate becoming linear and spreading near apex; at summit of scape a short somewhat secund raceme of up to 8 (or even 15) white or green translucent flowers, floral bracts linear, involute, acuminate, reflexed, pedicel 2–4 mm, ovary oblong, prismatic, 5 peri-

anth segments linear, 14 mm long, acuminate, labellum about 12–13 × 6 mm, white with purple veins, obovate or rhombic, trilobate, cuneate toward base, central part pilose within, central lobe broadly ovate, acutish, lateral lobes ovate-acute or acuminate; column 4–5 mm long, dilated upward, irregularly turbinate, pouch-like, lid cordate or spade-shaped; fruit ellipsoid, about 1 cm long.

A widespread species apparently formerly common on Guam, as there are records of people eating the watery tubers when thirsty while walking in the woods (Safford 1905), now seldom seen, as much of its habitat has been destroyed. It is known from the larger Marianas except Tinian, also from some of the northern Marianas.

Marianas Is.: s. l. [Gaudichaud] labelled "îles Mari." in Gaudichaud's hand, probably the type, but a further search may reveal other specimens in P or in other herbaria which have Gaudichaud specimens (e.g., G, F). Type locality Guam (Gaudichaud 1829). Alamagan: *Falanruw* 1928 (US); Anatahan: *Falanruw* 1914 (US), 1966 (US), 1967 (US). Saipan: Tapôtyo (Tapotchau), *Hosokawa* 6733 (US, BISH). Rota, acc. Tuyama (1941). Guam: M.C.S. Beach area (middle of N half of W Coast), *P. H. Moore* 1293 (US, BISH). Sigua River Canyon, *Rodin* 666 (US); Dededo, raised in pot from wild plant, *Fosberg* 64536 (US), 64537 (US).

Caroline Is.: Sonsorol, *Berry* 47 (US, BISH). Palau: Peliliu acc. Tuyama 1940. Yap: Mt. Dabiol, *Hosokawa* 8763 (BISH).

***Nervilia ovata*** Gaud., Bot. Voy. Uranie 422, 1829.

This name has not yet been typified, as Gaudichaud's specimen has not been located. Hence, since the description is inadequate, for now it must be regarded as a *nomen dubium*.

***Nervilia palawensis*** Schltr., Bot. Jahrb. 56: 447–448, fig. 1, 1921; Tuyama, Bot. Mag. (Tokyo) 54: 274–275, 1940; Okabe, Jour. Anthrop. Soc. Nippon 56: 413–427, 1941.

*Nervilia oxyglossa* Fukuyama, Tr. Nat. Hist. Soc. Formosa 27: 277–280, 1937.

Tuberous pseudobulb globose, stem from summit of pseudobulb, of 3–4 internodes, these bearing membranous scarious bladeless sheaths, leaf from terminal node, blade to 5 × 6.5 cm, broadly cordate to subreniform, subangulate, slightly acuminate, glabrous, thinly membranous, semi-translucent, gray-green densely white-punctate beneath, with 7 nerves, these prominent beneath, petiole to 5 cm; scape to 8 cm tall, with 3–4 sheathing bracts, uniflorous; flower brownish green, sepals and petals similar, linear lanceolate, to 15–18 mm long, labellum somewhat shorter, oblong in general outline, but trilobate, lateral lobes small, bluntly ovate, midlobe elliptic-obovate, apex rounded.

Schlechter based this species on a collection by Ledermann, no. 14539, from Ngatkip, on Babeldaob Island, which was apparently lost in the bombing of Berlin. Duplicates may exist in other herbaria, but we have not seen any. *N. oxyglossa* Fukuyama, based on Hosokawa 9146, from Ngaramiskang, which we have not seen, was reduced by Tuyama on the authority of Fukuyama to *N. palawensis*, as differing only in the size of the flowers. Tuyama cites three collections of his own, which we have not seen. Our specimens (*Fosberg* 47551) seem to correspond well with the original description. We accept Tuyama's disposition of *N. oxyglossa* on the basis of a comparison of the descriptions.

Apparently endemic to Palau, occurring on both volcanic and limestone substrata.

Caroline Is.: Palau—Babeldaob I., according to Schlechter, Fukuyama, and Tuyama. Aulupse'el I., Risong, Matuker Bay, 30–50 m, *Fosberg 47551* (US, BISH).

***Nervilia platychila*** Schltr., Bot. Jahrb. 39: 48, 1907; Hallé, Fl. Nouv. Caled. 8: 412–415, pl. 170, 1977.

*Nervilia ignobilis* Tuyama, Bot. Mag. (Tokyo) 54: 295–297, fig. 8, 1940; Jour. Jap. Bot. 17: 508–509, 1941.

*Nervilia umenoi* Fukuyama, Trans. Nat. Hist. Soc. Formosa 30: 428, 1941.

Pseudobulb tuberous, ellipsoid or subglobose, stem 2–5 cm long, leaf shortly (1–3 cm) petiolate, blade held horizontally near ground, broadly ovate-cordate with a broadly V-shaped sinus, nerves 7–9 (–11) alternately very prominent (even very narrowly alate) above and below, upper surface sparsely hirtellous; scape slender, erect, to 15 cm tall, with several sheathing cauline bracts or bladeless sheaths, raceme very short, 1–2 (–3) flowered, petals and sepals narrowly lanceolate, acute, 20–25 mm long, labellum obovate to very obscurely trilobed, column 9–10 mm long, slender, enlarged at summit.

The Micronesian plants differ slightly in the shape of the labellum, but seem to fit well into the widely distributed *N. platychila*, extending its distribution from New Caledonia and Fiji to Palau, Yap and Guam. If authentic material of *Nervilia ovata* Gaud. should be found and prove to be identical with Guam specimens cited below, the correct name for this widely distributed species would have to become *N. ovata*. *N. umenoi* Fukuyama was reduced to *N. ignobilis* by Tuyama. We have not seen the type of *N. umenoi* nor any of the specimens cited by Tuyama as *N. ignobilis*, from Palau and Yap, but the descriptions are close enough to *N. platychila*.

Marianas: Guam: headwaters of Ylig River, *Rodin 636* (US); Ylig Valley, 200 ft. *Steere 34* (US); Commarianas Hill southwest, 100 m, *Anderson 113* (US); S of Asan Point and Piti, 100 m, *Anderson 83* (US, BISH).

Caroline Is.: Palau: Babeldaob and Ngarakabesang, according to Tuyama. Yap: Atelieu village, Fanif Mun., *Falanruw 3578* (US).

***Nervilia trichophylla*** Fukuyama, Trans. Nat. Hist. Soc. Formosa 30: 428–429, 1940.

Said to be related to *N. palawensis*, but leaves broader, more reniform, sparsely hirtellous beneath, flowers smaller, greenish.

We have seen no material of this species, and admit it tentatively on the basis of Fukuyama's description and statements. It has apparently not been recollected. It is probably endemic to Palau and should be searched for on Babeldaob.

#### REVIEW OF SPATHOGLOTTIS IN MICRONESIA (ORCHIDACEAE)

*Spathoglottis* is an Indo-Pacific genus, with, according to Garay and Sweet (1974), "approximately 40 species distributed in India, Asia, Malaysia, Australia and adjacent islands." Cribb and Tang (1982) have recently published a review of the species occurring in Australia and the Pacific Islands, recognizing 7 species, of which they report 2 from Micronesia. One of these, *S. micronesiaca* Schltr., is omitted from their key, as they had



not seen specimens of it. We have actually four species from Micronesia and it seems desirable to make our records and observations available, and to provide a usable treatment for Micronesia.

Schlechter (1914) published two new species of *Spathoglottis* from Micronesia, *S. carolinensis* and *S. micronesiaca*. Kanehira (1935) repeated these records. Stone (1971) reported *S. plicata* Bl. (as introduced?) and *S. micronesiaca* from Guam. We have material of all of these and have added the very different *S. petri* Reichb. f. We are providing a brief description and key to the four Micronesian species, with brief characterization and distributional records of each.

***Spathoglottis* Bl., Bijdr. 400, 1825.**

Terrestrial, erect, with a small pseudobulb often covered with stiff fibers or leaf bases, several lanceolate prominently plicate leaves from the pseudobulb, scape from near base of pseudobulb, with several large bracts or sheaths on lower part, smaller usually ovate bracts subtending pedicels in distal floriferous part (raceme), often a few or many lower ones without flowers; sepals usually ovate or elliptic, with parallel nerves, petals similar but usually broader, labellum (in our species) sessile, with three principal lobes, often with 2 smaller ones ("teeth" or "auricles"), and 2 calli on claw of labellum below middle lobe, 2 basal lobes spreading, at 90° or less from axis, middle lobe often with a narrow claw bearing the smaller lobes marginally and 2 calli ventrally, at base, claw expanding distally into a blade, column without a knee, almost straight to notably curved downward, becoming winged distally, pollinia 8, in 2 groups of 4 each.

Key to Micronesian species:

1. Middle lobe of labellum sessile, not clawed ..... *S. petri*
1. Middle lobe of labellum with a slender claw ..... 2.
  2. Blade of middle lobe of labellum roughly obovate, or broadly spatulate, not notably emarginate though slightly plicate at center of apex, inflorescence glabrous or nearly so ..... *S. plicata*
  2. Blade of middle lobe notably emarginate. .... 3.
3. Flowers white, inflorescence with ovary buds and sepals notably short-hairy, blade of middle lobe obcordate, 3.5–5 mm wide ..... *S. micronesiaca*
3. Flowers pink to purple or rose, inflorescence and flower subglabrous, blade of middle lobe much broader than high, well over 5 mm wide, transversely reniform ..... *S. carolinensis*

***Spathoglottis carolinensis* Schltr., Bot. Jahrb. 52: 8, 1914; Cribb & Tang, Kew Bull. 36: 725–726, 1982.**

*Spathoglottis plicata* sensu Volkens 1901, non Bl., Bijdr. 401, t. 76, 1825.

Leaves broadly lanceolate, narrowed gradually to a long petiole; scape to 75 or more cm tall, stiff, racemose part usually glabrous, up to 8 cm, conspicuously bractate, with up to 15 pink flowers; lip deep pink or red with narrowly oblong basal lobes at right-angles to axis of lip, rounded apically, 7 mm long, middle lobe to 15 mm long, with narrow claw bearing 2 small lateral lobes at base, blade to 11+ mm wide, deeply emarginate expanded laterally into two rounded lobes,

We do not consider this to be "no more than a local form of the widespread *S. plicata* Bl.," as suggested by Cribb and Tang, though all the species of this affinity do look much alike. It seems to be as distinct as the others in the *S. plicata* group. We cannot lectotypify this name, as both syntypes were destroyed in Berlin. If any duplicates were distributed and exist in other herbaria, one would be a candidate for this status. Cribb and Tang cite syntypes as in B but with a dagger, which we assume means they were destroyed.

Known from Palau, where it seems not common, and Yap, where it is fairly common, on open savanna land, growing sympatrically with, but not noticeably intergrading with *S. micronesiaca*. Two collections from Rota, Marianas, seem to belong here, *Evans 2233* (US, BISH) and *Fosberg & Moore 58197* (US), both from Sabana. More material is needed.

CAROLINE ISLANDS: Palau: s.l. *Richardson 90* (US); Koror, reported by Schlechter on basis of *Raymundus 90*, which was presumably destroyed at B in World War II. Yap.: s.l. *Wong 573* (BISH, US); Mappu-to [Map], *Hosokawa 8927* (BISH); approach road to airport, 20 m, *Cushing & Cushing 347* (US); S. of Dinay, 25 m, *Cushing, Fosberg and Evans 504* (US); Rul Distr., airport road, 30 m, *Evans 2310* (US, BISH, POM, K, MO, TI); near Derikan, 10 m, *Fosberg 47589* (US); N. of Nimar, NNW of Colonia, 170 m, *Fosberg 46538* (US); near Fanaalily, on road to airport, *Fosberg 60087* (US, BISH, POM, K).

***Spathoglottis micronesiaca*** Schltr., Bot. Jahrb. 52: 9, 1914; Stone, *Micronesica* 6:162, 1971; Cribb & Tang, *Kew Bull.* 36: 728, 1982.

*Spathoglottis tomentosa* sensu Volkens in 1901, non Lindl., Bot. Reg. 31: sub t. 19, 1843.

Leaves narrow, linear-lanceolate, inflorescence rhachis, bracts. pedicels, ovaries, and outside of sepals notably short-hairy, raceme up to 10 cm long but occasionally elongating to as much as 16 cm, bracts acute; flowers white, petals somewhat wider than sepals, glabrous, labellum with basal lobes about  $6 \times 1.5$  mm, oblong, apically rounded, middle lobe with a narrow claw about 5–6 mm long, laterally woolly on ventral side at base, with 2 oblong lobules erect on ventral surface at base, blade obcordate 3.5–5 mm wide, column almost straight, curving slightly after anthesis, notably winged toward apex, spatulate, mature capsules 2–3 cm long.

Found commonly in the savannas of Palau and Yap, in the Carolines. Reported also from Rota in the Marianas by Kanehira, on the basis of his no. 1771, which we have not seen. We have some doubt as to this identification. It may be the Rota plant which we are calling, in this paper, *S. carolinensis*. Fosberg and Corwin (1958) reported *S. micronesiaca* as a fossil from Pagan, in the Marianas. This should be referred to simply as *Spathoglottis* sp., as we have no way of identifying it further in the absence of flowers.

We do not agree with Stone that *S. micronesiaca* is hardly different from *S. plicata*. We rather consider it related to the Philippine *S. tomentosa* Lindl., where Volkens put it, and which it resembles in its narrow leaves, hairy inflorescence which tends to elongate, but it differs in the shape of its floral bracts and in the shape of the blade of the middle lobe of the labellum.

CAROLINE ISLANDS: Palau: s.l. *Richardson 25* (US); *Herre 9* (Bish); Kaiguru, *Takamatsu 1640* (BISH); Babeldaob: Ngaramiskang Colony, upper Ngaramiskang River, *Fosberg 25707* (US), *25754* (US, BISH, K, POM); Ngeremtengel, *Fosberg 32461* (US); Ngatpang (as Gaspan), *Stone 4650* (GUAM); Ngardok (as Garudokku), *Takamatsu 1415* (BISH), *1365* (US, BISH); Lake Ngardok, 30–50 m, *Fosberg 32542* (US, BISH, K); Airai, *Fosberg 47696* (US), Koror: s.l. *Hill 21* (BISH); *Blackburn E69* (US); *Fosberg 50620* (US); “Babelthuap Rock Road”, *Salsedo 93* (US); Ngerbechedesau, *Hardy 14* (US). Ngarakabesang (as Arakabesan): s.l. *Hardy 64* (US); Old Seaplane Base, W. side, 2–5 m, *Fosberg 32289* (US). Yap: s.l., *75'*, *Wong 540* (US, BISH); Gorrer, central plateau, 100', *Hosaka 3309* (US, BISH); Tomil, 100', *Hosaka 3289* (US, BISH); plateau W. of Gatschapar and N. of Maa, Tomil Distr., *Fosberg 25615a* (US); S. of Dinay, 25 m, *Cushing et al 503* (US); N. end of Gagil Distr., SW of Maki, 30–50 m, *Fosberg 25608* (US); near Derikan, 20 m, *Fosberg 46590* (US); top of hill N. of Nimar, NNW of Colonia, 170 m, *Fosberg 4653* (US); Rul Distr., Airport Road, 30 m, *Evans 335* (US, BISH); approach road to airport, 20 m, *Cushing and Cushing 34* (US); near Gaanpan village, Dalipepinbau Mun., *Fosberg 60092* (US, BISH); near Fanaalily, on road to airport, *Fosberg 60088* (US, BISH, POM).

***Spathoglottis petri*** Reichb. f., Gard. Chron. 2: 392, 1877; Hallé, Fl. Nouv. Caléd. 8: 215–217, 1978; Cribb and Tang, Kew Bull. 36: 726, 1982.

Plant with fascicled pseudobulbs 4 × 2.5 cm, leaves broadly lanceolate, acuminate, plicate, 9 principal nerves; scape a little shorter to longer than leaves, with 4 appressed sheathing cauline bracts; raceme with few to many sterile broadly lanceolate, 2 cm long, cymbiform bracts on its elongate, up to 22 cm, sterile part below floriferous portion, similar bracts subtending the up to 10 pedicels, to 2 cm long, fertile part of raceme to 7–9 cm long; flowers bright deep purple, to 3–4 cm across, ovary 1–1.5 cm, perianth parts firm in texture, sepals broadly elliptic, to somewhat ovate, acute, about 15 × 8 mm, 2 petals similar, slightly broader, labellum to 14 mm long, cut about 1/3 or 1/4 into 3 lobes, lateral broad, rounded, ascending, middle one sessile broad rounded or obcordate or only slightly emarginate, with a single slight tooth in middle of sinus, with 2 erect strongly pilose white calluses, sinuses between lobes practically closed.

This is a very distinct species, not closely related to the other Micronesian ones. Its flowers, in Melanesia, are described as rose-pink, while those in Micronesia, as far as color is recorded, are deep purple. It should be looked for and recollected in Palau, and as much information as possible recorded.

This species, previously known only from the New Hebrides and New Caledonia, is an unexpected new addition to the Micronesian flora. The two collections from Palau have little recorded information on their labels, but Robert Owen (pers. comm. 1985) remembers seeing deep purple-flowered plants growing undoubtedly wild on southern Babeldaob. On Ponape the species was only seen in a garden. It may have been brought from Palau as an ornamental.

CAROLINE ISLANDS: Palau: Koror, Ikela, *Blackburn 198* (US); Ngnatmeduch Rock, *Hardy 71* (US), this may be this species but is from an immature plant. Ponape: Colonia, cultivated, *Fosberg 60531* (US).

**Spathoglottis plicata** Bl., Bijdr. 401, t. 76, 1825; Stone Micronesica 6: 162, 1971; Moore et al., Inv. Mapping Wetl. Veg. 1–253, Agaña 1977; Cribb and Tang, Kew Bull. 36: 722–725, 1982.

Plant to 1 m tall, pseudobulbs ovoid to conic, leaves prominently petiolate, blades linear to lanceolate, acuminate, strongly plicate; scape slender, to 1 m tall, raceme densely to sparsely flowered, to 10 (–15) cm long, rarely much more elongate to as much as 30 cm, but then with lower part clothed only with persistent ovate acuminate bracts and still flowering only in apical few cm, occasionally a few sterile bracts scattered at the top of the scape below the flowering or fruiting raceme, rhachis and pedicels occasionally very slightly spreading puberulent; flowers rose-pink to medium purple (elsewhere said to be pink or even white), sepals broadly ovate-elliptic about 15–16 mm long, concave, with a prominent involute small acumen or mucro, 7–9 parallel nerves slightly forking distally, middle nerve stronger, petals similar but broader, not or scarcely mucronate, 11–13 nerves, labellum about equalling petals, basal lobes at right angles to axis, oblong, about 7 mm long, rounded-subtruncate, mid-lobe with a narrow claw with 2 lobules (“auricles”) at base, 2 notably pilose calli, claw broadening into a broadly spatulate subtruncate or very slightly emarginate blade about 6 mm wide, distal margin entire to slightly erose or serrulate, in middle slightly plicate, column 10–11 mm long, curved, wing-margined, becoming more broadly so above; fruit 2.5–3 cm long, subprismatic.

Plants vary in size and leaf width, but in Guam they are otherwise rather uniform. This species is found over a vast range, extending from India east to Tonga, New Caledonia, New Guinea, the Philippines and Guam (Cribb and Tang, 1982) and is notably variable, the Guam plants showing only a small segment of this variability. One cannot rule out the possibility that *S. plicata* is a relatively recent introduction in Guam, as it was apparently not collected before 1953. Earlier herbarium records seen by us are misidentifications of *Eulophia magregori*. Stone apparently regarded it as an introduction. It is now common and widely distributed on the island. It may also have been introduced into Tahiti.

Specimens examined:

Marianas: Guam: Northwest Field, 160 m, *Fosberg 43439* (US, BISH, POM); Harmon Loop Road, *P. H. Moore 590* (US); Atantano River, *P. H. Moore 873* (US); Lujuna, just off route 15, 180 m, *Evans 1583* (US, BISH); Manengon Conservation Area, S. escarpment of Ylig River Valley, *Fosberg 50555* (US, BISH, POM, K, MO); Mr. Look’s property, just above Yoña, 100–150 m, *Evans 693* (US); Estuary of Sasa River, near Apra Harbor, *Stone 4153* (US, GUAM); sandspit near OSIR road, Apra Harbor, *Stone 4458* (GUAM); 1 mi. S. of Mt. Tenjo, *Fosberg 35226* (US, BISH, A, POM); Mt. Jumullong Manglo, 300–325 m, *Evans 232* (US, BISH, K); peak 0.7 km S of Mt. Jumullong Manglo, *Fosberg 59828* (US, BISH).

#### RHYNCHOPHREATIA IN MICRONESIA

Although the genus *Rhynchophreatia* (Schltr.) Schltr. is usually included in *Phreatia* Lindl. we have decided to maintain it as separate, following Schlechter (1921) and Hallé (1977). In habit and several floral characters it seems quite recognizable. Schlechter placed in it six New Guinea species and one from Palau. Hallé reports *R. micrantha* from

a wide range in Melanesia and western Polynesia, and we are interpreting one of the Marianas species of *Phreatia* as belonging to it. Possibly other non-Micronesian *Phreatia* species would go here if examined for the characters we use.

**Rhynchophreatia** (Schltr.) Schltr., Bot. Jahrb. 56: 488, 1921.

*Phreatia* Lindl. sect. *Rhynchophreatia* Schltr., Orch. Deutsch Neu-Guinea, in Fedde, Repert. Sp. Nov. Beih. 1: 909, 1914.

Schlechter published the genus *Rhynchophreatia* in two (or perhaps three) places by combining two of his previously published sections of *Phreatia*, sect. *Rhynchophreatia* and sect. *Diplostypus*, and elevating them to generic rank under the name *Rhynchophreatia*. Schlechter (1921, p. 488), in discussing the establishment of his new genus, says that he had earlier remarked that it would seem more natural to consider his two sections, *Didymostypus* and *Rhynchophreatia* as separate genera because the long rostellum and presence of callosities near the base of the rostellum distinguish them sharply from *Phreatia*, in which the base of the rostellum is hollow. He also distinguished *Rhynchophreatia* from *Oxyanthera* by the presence in the former of a distinct column-foot. He does not give a proper description or even diagnosis of the genus, which must rest on the short diagnosis of the section *Rhynchophreatia* in the 1914 publication. He includes six New Guinea *Phreatia* species in the genus and describes *R. palawensis* as new from Palau. Since the genus is founded on the section of the same name, it must be typified by the type of this section.

In the original treatment of the section are included two species, *Phreatia wariana* Schltr. and *R. digulana* Schltr. The latter name is an illegitimate renaming of *Thelasis phreatioides* J. J. Smith. Since Schlechter describes *P. wariana* as new, in some detail, it seems logical to select it as lectotype of *Rhynchophreatia* as a section, and hence also as a genus.

N. Hallé (1977, p. 341) refers, without comment, to *R. palawensis* Schltr. as the type species. We do not regard this as a satisfactory lectotypification since *R. palawensis* was not yet described when sect. *Rhynchophreatia* was created. Hence we formally designate *P. wariana* Schltr. as lectotype. This species was based on two collections, *Schlechter 19327* (flowering) and *17470* (fruiting). We select the flowering specimen as type of the species, as important characters are in the flowers. Both specimens were in Berlin and probably destroyed in World War II. We do not know if duplicates exist elsewhere.

Schlechter frequently refers back to his previous discussions without even giving references to where they were published, so we cannot be sure we have caught the earliest mention of his sections of *Phreatia*. However, in his 1914 treatment he seems to regard his sectional arrangement as new. Hence it seems safe to date the sectional name from this publication. It is interesting to note that he says specifically that his six sections depend on habit.

It is because of its very distinct habit, in addition to some floral characters, that we recognize *Rhynchophreatia* as a genus separate from *Phreatia*. The large flat strap-shaped distichous leaves, with a sharp transverse dehiscence in age, leaving clear basal remnants, seem to characterize at least the Micronesian species. This is very well illustrated, in its most extreme form, by the drawing, by N. Hallé (1977, pl. 140), of *R. micrantha* (A. Rich.) Hallé.

Most writers, except N. Hallé (1977), have recombined *Rhynchophreatia* with *Phreatia*, because the floral distinctions are not very impressive. However, the tall rostellum, presence of a column-foot and of callosities near the base of the labellum, combined with the distinctive habit mentioned above, seem to justify its retention. Schlechter retained *Phreatia carolinensis*, and Fukuyama *P. pacifica*, in *Phreatia*. However, each of these species has a pair of inconspicuous "incrassations" (callosities?) at or near the base of the labellum, instead of the latter being hollow as in *Phreatia*. We are treating them as *Rhynchophreatia* on the basis of this feature plus the habit. The importance of these characters is arguable.

The genus is known from New Guinea, Melanesia, western Polynesia, and Micronesia.

The four Micronesian species that appear to belong here are as follows:

***Rhynchophreatia carolinensis*** (Schltr.) Fosberg and Sachet, n. comb.

*Phreatia carolinensis* Schltr., Bot. Jahrb. 56: 486, 1921.

This species is probably endemic to Ponape, though Kanehira, (1935, p. 300) considers that it came from Truk, probably on the basis of the locality "Tol". However, Ledermann's "Tol" seems to have been on Ponape, and we have no subsequent collections from Truk. The two Ledermann specimens, nos. 13396 and 13842, both from "Tol, auf Ponape" were probably destroyed in Berlin. If the species has been found since the type collection, the records have not come to our attention. Information as to the existence of duplicates of the Ledermann collections, or of any subsequent findings of this species would be important.

We know the species only from Schlechter's description of it.

***Rhynchophreatia micrantha*** (A. Rich.) N. Hallé, Fl. Nouv. Caléd. 8: 341, pl. 140, 1977.

*Oberonia micrantha* A. Rich., Voy. Astrolabe Bot., tab. 3, 1833; tab. 7, 1834.

*Phreatia micrantha* (A. Rich.) Schltr., Repert. Sp. Nov. Beih. 1: 919, 1914.

*Thelasis samoensis* Kränzl., Bot. Jahrb. 25: 607, 1888.

*Phreatia samoensis* (Kränzl.) Schltr., Mem. Herb. Boiss. 21: 75, 1900.

*Phreatia ladronica* Tuyama, Bot. Mag. (Tokyo) 54: 277, 1940 (as *landronica*).

A species of Melanesia and western Polynesia, found in Micronesia in the Marianas: Saipan, Rota, and Guam. The type is from New Caledonia (not seen by us). The type of *P. ladronica* Tuyama is Hatusima 10,673 (TI) (not seen by us).

MARIANA ISLANDS: Rota, Sabana, 150–250 m, *Evans 2100* (US); Guam: Machanao Distr., 110 m, *Bryan 1186* (BISH); Maguao, 150 m, *Bryan 1037* (BISH, US); Mt. Lamlam, *G. C. Moore 262* (US); *Anderson 323* (US).

***Rhynchophreatia pacifica*** (Fukuyama) Fosberg and Sachet, n., comb.

*Phreatia pacifica* Fukuyama, Tr. Nat. Hist. Soc. Formosa 29: 100–101, 1938.

*Phreatia pacifica* var. *minor* Fukuyama, Tr. Nat. Hist. Soc. Formosa 29: 101, 1938.

Endemic in the Caroline Islands, Kusaie (Kosrae).

CAROLINE ISLANDS: Kusaie (Kosrae), Finkol, *Hosokawa 7356* (TI, type, not seen by us), *9359* (BISH); Mt. Matante (Buache), *Townes 5* (US); *Takamatsu 547* (BISH, US); *Hosokawa 6289* (BISH); *Fosberg 26624* (US, BISH).

**Rhynchophreatia palawensis** Schltr., Bot. Jahrb. 56: 488, 1921.

*Phreatia palawensis* (Schltr.) Tuyama, Bot. Mag. (Tokyo) 54: 248, 1940.

*Phreatia ryozoana* Tuyama, Bot. Mag. (Tokyo) 53: 54, 1939.

Known only from Caroline Islands, Palau: Babeldaob, Koror, Aulupse'el.

CAROLINE ISLANDS: Palau: Babeldaob, s.l. Kanehira 1948 (TI, type of *P. ryo-soana*, not seen by us); Ngatpang (Gaspan), *Hosokawa 9656* (BISH); Tabagatang R., 5 m, *Canfield 376* (US); Ngchesar, Ngardok R., 5 m, *Canfield 431* (US); Melekiok (Marukioku), *Takamatsu 1716* (BISH); Kasiuru, *Takamatsu 1493* (BISH); Airai, Dam site, *Fisher 120* (US); Ngerikil River, *Fisher 89* (US). Koror: Ngarmid, 25 m, *Canfield 299* (US). Aulupse'el I.: Risong Bay, *Evans 618* (US).

#### SYNOPSIS OF TAENIOPHYLLUM BL. IN MICRONESIA (ORCHIDACEAE)

*Taeniophyllum* Bl. is a curious genus of usually epiphytic orchids widely distributed in the Indo-Pacific region from Ceylon to Mangareva and north to Japan. Its most striking feature is, at least in most species, a total absence of leaves, the photosynthetic function is taken over by a pseudo-whorl of flattened fleshy roots radiating from a condensed stem. The flowers are minute, borne on distichous, or somewhat spiral, bracteate racemes or spikes between the bases of the photosynthetic roots; labellum usually somewhat gibbous or sac-like.

The Micronesian species of the genus *Taeniophyllum* Bl. are not well-distinguished on the basis of presently available material. The following is offered, to separate the species until a critical study can be undertaken, based on more observation of fresh flowering plants.

Four entities have been described. Of these *T. palawense* Schltr. is abundantly distinct, probably belonging to subgenus *Codonosepalum* Schltr., as the sepals and petals are united below. Its habit is also distinctive, its photosynthetic roots ascending, not tightly appressed to the substrate as with the other Micronesian species, all in subgenus *Taeniophyllum*.

The other three described taxa, with a fourth (not described) which appears somewhat different, too close to *T. marianense*, but differing in width of photosynthetic roots and in coarseness of racemes, are mutually very similar and could, without much difficulty, be lumped into one. However, there are differences, and until more ample flowering specimens are available, we will treat them as distinct.

**Taeniophyllum** Bl., Bijdr. 6: t. 3, f. 70; 8: 355, 1825.

The following key will separate the species, but with difficulty.

Key to Micronesian taxa:

1. Aerial roots ascending, not appressed to substrate, petals and sepals united below . . . . . *T. palawense*
1. Aerial roots closely appressed to substrate, petals and sepals separate . . . . . 2.
  2. Aerial roots 3–3.5 mm wide . . . . . *T. sp.*
  2. Aerial roots 1.5–2.5 mm wide, flexuous . . . . . 3.

- 3. Raceme rhachis spirally flexuous . . . . . *T. marianense*
- 3. Raceme rhachis notably distichous . . . . . 4.
- 4. Perianth 2–3 mm long . . . . . *T. petrophilum*
- 4. Perianth 2 mm long . . . . . *T. trukense*

**Taeniophyllum marianense** Schltr., Bot. Jahrb. 52: 13, 1914.

Originally published as a new name for *T. fasciola* sensu Safford non (Forst. f.) Reichb. f.

Known from the Marianas: Sarigan, Saipan, Tinian, Rota and Guam. Reported from Yap and Ponape of the Carolines, but these reports probably apply to *T. petrophilum* Schltr.

This species was first recorded by Gaudichaud, in Freycinet, Voyage of the Uranie, Bot. 427, 1826. It is fairly common, but not usually collected in good flowering condition. The fruits are weakly ribbed.

This plant has been referred to as *Epidendrum fasciola* Forst. f., *Limnodorum fasciola* Sw., *Vanilla fasciola* Spreng, and *Taeniophyllum fasciola* (Forst. f.) Reichb. f., all of which names refer to the very similar Polynesian species described from Tahiti as *Epidendrum fasciola* by the younger Forster, Prodr. 60, 1786.

Typification of *T. marianense* Schltr. presents a problem. It was based on Safford's description in Contr. U.S.N.H. 9: 381, 1905, and we have seen no specimen of it collected by Safford. The only specimen Safford mentions was "Collected on Guam by Gaudichaud and by him called *Vanilla fasciola*". This specimen was clearly not seen by Safford, but doubtless exists. It may be in Paris, Florence, or even Geneva. It probably must be regarded as the type if it can be found. Otherwise the type must be Safford's description.

MARIANAS ISLANDS: Since this species is very generally distributed in the archipelago, except in the more northern volcanoes, and collections are numerous, citations are only by collector, number, and island, omitting precise localities on the islands.

Alamagan I.: *Fosberg 31677* (US). Sarigan I.: *Evans 2400* (US); *Falanruw 1756* (US). Saipan I.: *Fosberg 31324* (US). Tinian I.: *Fosberg 24711* (US); *Hosaka 2858* (US). Rota I.: *Evans 1995* (US); *2213* (US) (racemes somewhat longer and more robust than usual). Guam I.: *Anderson 168* (US); *Bryan* in 1936 (BISH); *Costenoble 1175* (US); *Evans 1480* (US); *1827* (US); *Fosberg 35268* (US); *43455* (US); *43495* (US); *43426* (US); *43485* (US); *59769* (US) (racemes somewhat longer and more robust than usual); *25485* (US); *32621* (US); *59618* (US, BISH, POM); *Fosberg & Anderson 32621* (US); *Grether 3702* (US); *Moran 4402* (UC); *Sachet 1700* (US); *Steere 60* (US); *Stone 4742* (GUAM); *4145* (GUAM).

**Taeniophyllum palawense** Schltr., Bot. Jahrb. 56: 500, 1921.

Discussed above, known only from Palau.

CAROLINE ISLANDS: Palau: "Ngarsúl", 200–300 m, *Ledermann 14492a* (B, lectotype). Babeldaob: SW of Mt. Yekigoroto, 130 m, *Fosberg 47705* (US); Garasumao, *Takamatsu 1563* (BISH); Airai, *Hosokawa 7224* (BISH); Airai waterfalls, 1.5 km due N of airfield, off road to Kume Kumeyel River, 10 m, *Canfield 264* (US); Almaten, *Takamatsu 1541* (BISH). Koror, according to Kanehira (1935).



**Taeniophyllum petrophilum** Schltr., Bot. Jahrb. 56: 501, 1921.

Known from the Carolines: Palau, Yap, Woleai, Ponape, and Satawan. Most of available specimens are very poor, except one collected by Joan Canfield, in Palau (677), which is accompanied by drawings and color notes on the flowers. The fruits are strongly ribbed.

CAROLINE ISLANDS: Palau: Babeldaob: Me'ebe'ubul, 4 m, *Fosberg 32441* (US); Koror Distr.: Ngermeyaus I., 1 m, *Canfield 677* (US). Yap: Rul Distr.: *Evans 306* (US), *314* (US); Ma'lai village, 3 m, *Fosberg 46348* (US); Ruman-to (Rumung I.) *Hosokawa 8943* (BISH, US); Benig, *Stemmermann 31818* (BISH); Kanif, *Takamatsu 1952* (BISH). Woleai Atoll, *Townes s.n.* (US); Satawan Atoll, Rechemanu I., *Anderson 1133* (US, BISH, POM, NY, L). Ponape: Jokaj, *Takamatsu 779* (BISH); *Stone 1858* (BISH); *Riesenberg 1* (US); Reitau Gensei-rin, 100 m, *Hosokawa 9575* (BISH).

**Taeniophyllum trukense** Fukuyama, Bot. Mag. (Tokyo) 51: 905, 1937; Hosokawa, Bull. Biogr. Soc. Japan 7: 188, 1937.

Doubtfully distinct from *T. petrophilum* Schltr. Known only from Truk, in the Carolines. We have seen only a single sterile specimen, *Takamatsu 307* (BISH), from Nat-sushima (Dublon), which may be this.

**Taeniophyllum** sp.

Close to *T. marianense* Schltr. but roots much broader, racemes more robust. Material imperfect.

MARIANA ISLANDS: Alamagan I.: around Partido Village, *Fosberg 31677* (US).

#### TRACHOMA GARAY IN GUAM (ORCHIDACEAE)

Plants of the *Thrixspermum* affinity, in Guam commonly referred to *Saccolabium guamense* Ames, have been placed in *Trachoma* Garay, segregated by Garay (1972) from *Saccolabium* Bl. and *Tuberolabium* Yamamoto. We are following Garay rather than any of the other interpretations of *Thrixspermum* and its allies, as he has examined the group in relation to related groups of the "Monopodial orchids" with a more critical approach than we have encountered elsewhere. We await his more complete and argued treatment, and his papers on typification; when this becomes available it may be possible for a floristic botanist to get a grasp of the multitude of genera comprising this assemblage. Garay has proposed the combination required for the Guam plant. We mention it here, as many people may not have access to its place of publication.

**Trachoma** Garay, Bot. Mus. Leafl. 23: 207–208, 1972.

**Trachoma guamense** (Ames) Garay, Bot. Mus. Leafl. 23: 208, 1972.

*Saccolabium guamense* Ames, Phil. Journ. Sci. Bot. 9: 15, 1914.

MARIANAS ISLANDS: Guam: just S. of North Field, 150 m, *Fosberg & Anderson 32625* (US); 1 mi. S. of Tuguac on N. plateau, 110 m, *Fosberg 35483* (US); back of Agriculture Demonstration Farm, 1 km N. of Yigo, 155 m, *Fosberg 39263* (US); Mt. Lamlam, *Anderson 327* (US).

## References Cited

- Backer, C. A. and R. C. Bakhuizen van den Brink. 1968. Flora of Java, Vol. 3, 761 pp., Groningen.
- Barrau, J. 1961. Subsistence agriculture in Polynesia and Micronesia. Bishop Mus. Bull. 223: 1-94.
- Burkill, I. N. 1951. Dioscoreaceae, in van Steenis, ed., Flora Malesiana I, 4: 293-335.
- Cribb, P. J. and C. Z. Tang. 1982. *Spathoglottis* (Orchidaceae) in Australia and the Pacific Islands. Kew Bull. 36: 721-729.
- Fosberg, F. R. and G. Corwin. 1958. A fossil flora from Pagan, Mariana Islands. Pac. Sci. 12: 3-16.
- Fosberg, F. R., Marie-Hélène Sacht and Royce Oliver. 1979. A geographical Checklist of the Micronesian Dicotyledonae. Micronesica 15: 41-295.
- Fosberg, F. R., Marie-Hélène Sacht and Royce Oliver. 1982. Geographical Checklist of the Micronesian Pteridophyta and Gymnospermae. Micronesica 18: 23-82.
- Fukuyama, N. 1938. Einige neue Orchideen von Mikronesien . . . Trans. Nat. Hist. Soc. Formosa 28: 1-7.
- Garay, L. A. 1972. On the systematics of the monopodial orchids. Bot. Mus. Leaflets 23: 149-212.
- Garay, L. A. and H. R. Sweet. 1974. Orchids of the Southern Ryukyu Islands. 180 pp. Cambridge, Mass.
- Glassman, S. F. 1952. The flora of Ponape. Bishop Mus. Bull. 209: 1-152.
- Hallé, N. 1977. Flore de la Nouvelle-Calédonie et dépendances. 8. Orchidacées. 565 pp., Paris.
- Holtum, R. E. 1964. A revised flora of Malaya. Vol. 1. Orchids of Malaya. 759 pp. Singapore.
- Kanchira, R. 1935. An enumeration of Micronesian plants. Jour. Dept. Agr. Kyushu Univ. 4: 237-464.
- Nakao, S. 1953. Breadfruit, yams and taros of Ponape Island. Proc. 7th Pac. Sci. Congr. 6: 159-170.
- Overy, R., I. Polunin and D. W. G. Wimblett. 1982. Some plants of Kiribati, an illustrated list. 80 pp. Tarawa.
- Prain, D. and I. N. Burkill. 1936. An account of the genus *Dioscorea* in the East. Part I—The species which twine to the left. Ann. R. Bot. Gard. Calcutta 14(1): 1-210.
- St. John, H. 1954. The Hawaiian variety of *Dioscorea pentaphylla*, an edible yam. Jour. Polyn. Soc. 63: 27-34.
- Schlechter, R. 1911-1914. Die Orchidaceen von Deutsch Neu-Guinea, in Fedde, Repert. Beih. 1, 1079 pp.
- Schlechter R. 1921. Die Orchidaceen von Mikronesien. Bot. Jahrb. 56: 434-501.
- Schlechter, R. 1982. The Orchidaceae of German New Guinea. 1180 pp. Melbourne. (Translation of Schlechter 1911-1914, by R. I. Rogers et al.)
- Tuyama, T. 1939-1940. Orchidaceae Novae Micronesicae. I. Bot. Mag. (Tokyo) 53: 52-59; II. 54: 261-272; III. 273; IV. 295-298.