

## Plants of Southeastern Polynesia. 3.

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### Abstract

In this paper are presented critical notes and records of species of *Ophioglossum* (Ophioglossaceae), *Waltheria* (Sterculiaceae), *Alyxia* (Apocynaceae) and *Morinda* (Rubiaceae), a new varietal combination and two new varieties in *Alyxia stellata*, and a discussion of the generic separation of *Ochrosia* and *Neiosperma* (Apocynaceae).

***Ophioglossum pendulum* var. *falcatum*** (Presl) Fosberg, Occ. Pap. Bishop Mus. 23:29, 1962.

*O. pendulum* L. f. var. *pendulum* is common at low and moderate elevations in Tahiti. A collection from 1100 m elevation, south of Orohena, *MacDaniels 1533* (US) is perfectly typical var. *falcatum*, apparently the first record of this variety from the Society Islands and from southern Polynesia. It is by far the commoner form in the Hawaiian Islands. The typical form, var. *pendulum*, with long pendant sterile parts of the fronds is common in Tahiti but very rare in Hawaii.

***Waltheria tomentosa*** (J. R. & G. Forst.) St. John, Nat. Can. 98:573, 1971.<sup>2</sup>

*Lophanthus tomentosus* J. R. & G. Forst., Char. Gen. 14, 1775; 28, pl. 14, 1776.

*Waltheria lophanthus* Forst. f., Prodr. 47, 1786.

It is surprising that no one had made this transfer. Of course, the application of the "Kew Rule" would have made it inappropriate prior to the formulation of the modern International Rules of Botanical Nomenclature at the Vienna Congress in 1905. However, there seems to be no reason for not now taking up the oldest available epithet for this plant.

This species is still to be found on the dry sides of most of the Marquesas and on the smaller, low dry islands of the group.

***Alyxia*** R. Br., Prodr. 469, 1810, nom. cons.

*Gynopogon* Forst., Char. Gen. 18, 1775; 35, pl. 18, 1776, nom. rejic.

Shrubs or more usually woody vines, sparingly lactiferous; leaves opposite or whorled; flowers small, in few-flowered axillary cymes, sepals free or almost so,

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<sup>2</sup> St. John, *Le Naturaliste Canadien* 98: 561-581, 1971, has shown that there exists an earlier edition of the Forsters' *Characteres Generum* . . . , printed and bound in folio size, with different pagination from the generally known quarto edition of 1776, and published between Nov. 29 and Dec. 22, 1775. Thus names originally published in this work date from 1775 rather than the usually cited March 1, 1776. Only two copies of this earlier edition are known, one in the British Museum library, the other at the Linnean Society, London.

small, ovate or triangular, 4–5, corolla regular, salverform, with 4–5 ovate, oblong or orbicular lobes, tube swollen at attachment of stamens, carpels 2, with several ovules each and a single style; fruit a pair of elongate moniliform drupes, one frequently aborted, each with 1–several globose to oval stones.

A genus with 30 or more species, extending from Henderson Island to Ceylon, north to Hawaii and the Marianas, with most species in Melanesia and New Guinea.

In Southeastern Polynesia the plants of this genus have traditionally been placed in two species, *A. stellata* and *A. scandens*, distinguished by having the leaves in whorls of 3 and opposite, respectively. Actually there are a number of forms on different islands. The leaf arrangement is not a satisfactory means of dividing them into two species, as many plants have both opposite and ternate leaves on the same plant. There are also variations in leaf size and shape, in size and complexity of the cymes, in size and shape of calyx lobes, corollas, and fruits. Distinctive forms are known from the Marquesas, Society Islands, Cook Islands (*A. elliptica* Cheesem.), Austral Islands, Rapa, Henderson, Pitcairn, Makatea, and both species are said to extend far to the west.

One reason these have not been looked at seriously may be the notoriously difficult situation with *Alyxia olivaeformis* Gaud. in Hawaii, where it is a common and extremely variable plant. There it occurs in many forms and scattered over the six major islands in moist and wet montane forests. These forms seem to occur in no resolvable geographical pattern at all, though they have not been studied using modern biosystematic methods. It seems possible that such an approach may show that definable populations with geographic or ecologic ranges exist. If such a study is to be made it must be soon, as the habitats of *Alyxia* in Hawaii are fast being destroyed. There has been a feeling that the Polynesian species may be similarly variable, and perhaps with reason.

Plants with strictly opposite leaves and flowers mostly well over 5 mm long occur on Tahiti. These should probably be placed in *A. scandens*, as Forster's specimen of *Gynopogon scandens* in Paris seems to be of this sort. Material with smaller flowers (3–6 mm) and leaves ternate or ternate and opposite might be regarded as *A. stellata*, as the Forster sheet of this in Paris has two twigs, one of which is a broad-leafed ternate form with small flowers. The Paris sheets of Forster's collections mentioned above have no localities given.

***Alyxia scandens*** (J. S. & G. Forst.) R. & S., Syst. 4:440, 1819.

*Gynopogon scandens* Forst., Char. Gen. 18, 1775; 36, 1776. Forst. f., Prodr. 19, 1786.

Leaves opposite, ovate to elliptic or elliptic-oblong-lanceolate, up to 11 × 4 cm, petiolate; inflorescences triflorous or twice trichotomous, corollas 5–10 mm long, lobes 4–5 mm, tube dilated somewhat near summit, lobes patent; fruits with segments oval or subglobose, 12–14 mm long, 9–11 mm wide.

A sheet without locality, *Forster 55* (P) corresponding to the above description may exemplify the Forsters' concept of their species. Other collections tentatively referred here, all from Tahiti, are two collected by *Vesco* in 1847 (P, US), one each by

*Lépine 192* (P), *U. S. Exploring Exped. s. n.* (US), and *Setchell & Parks 345* (US). A collection from Makatea, *Wilder 1143* (NY) probably belongs here too, though another, from the same island, *Jones 905* (US), has a few of the leaves in whorls of three. The species was originally described from the Society Islands, and has been reported from as far west as Fiji and Samoa. No material that we have seen from the Marquesas fits the above description. Undoubtedly there are distinguishable populations in this species, but we are not yet ready to characterize them.

***Alyxia stellata*** (J. R. & G. Forst.) R. & S. Syst. 4:439, 1819.

*Gynopogon stellatum* J. R. & G. Forst., Char. Gen. 18, 1775; 36, 1776.

Woody twining vine (at least in the Marquesas); leaves ternate or ternate and opposite; flowers in cymes of 3–4; cymes to 4 cm long; corollas up to 6 mm long; lobes patent, tube dilated to near summit, lobes somewhat longer than broad; fruits black, with segments subglobose to at least 12 × 10 mm.

This species is widespread in southeastern Polynesia. It was originally described from the Society and Friendly islands (Tonga), and the name has been applied to plants from as far west as Malaya. It probably does occur throughout Polynesia (except Hawaii) in one form or another. The populations found on different islands seem distinguishable but the variation is puzzling. Only the Marquesan varieties will be described here. We have examined material without locality of *Forster 54* (P). It has very short flowers with inrolled calyx lobes that appear acute. We are not ready to designate a lectotype until we can examine other Forster sheets, hopefully with indication of localities.

The known Marquesan varieties may be distinguished as follows:

1. Leaves broadly ovate, base cordate or subcordate, cymes several cm long  
..... var. *deckeri*
1. Leaves elliptic or elliptic-lanceolate, cymes usually less than 25 cm long.
  2. Leaves broadly elliptic, extreme apices rounded.....  
..... var. *marquesensis*
  2. Leaves elliptic-lanceolate, acuminate..... var. *fatuhivensis*

***Alyxia stellata* var. *marquesensis*** (F. Br.) Fosberg & Sachet, new comb.

*Alyxia stellata* f. *marquesensis* F. Br., Bish. Mus. Bull. 130:230, 1935.

Most of the Marquesan material of *A. stellata* presents a fairly uniform aspect, with coriaceous, broadly elliptic leaves, about half or slightly more as long as wide, acute to obtusish at base, acute to acuminate in general outline at apex but tip rounded, veins obscure to visible; cymes to 2.5 cm long, stout, pedicels minutely puberulent, sepals broadly triangular or triangular-ovate, puberulent.

Found in cloud forests and other wet montane woods.

Marquesas: Nukuhiva I.: s. l., *Quayle 1323* (BISH); 200–1000 m, *Brown 562 A* (BISH); Ooumu Mt., 3500 ft., *Mumford & Adamson 583* (BISH), *Adamson & Mumford 583* (NY). Uahuka I.: *Quayle 1721* (BISH). Mohotani I.: Momoei, *Adamson & Mumford 538* (NY); 300 m., *Mumford & Adamson 538* (BISH). Hiva Oa I.: Vaiee Tanaeka Valley, 250 m, *Mumford & Adamson 428* (NY); Hanahoo Valley, *Mumford & Adamson 362* (BISH, UC).

***Alyxia stellata* var. *fatuhivensis* Fosberg & Sachet, new var.**

Planta scandens lignosa, foliis elliptico-lanceolatis, valde acuminatis maxime 6 × 1.8 cm, basin attenuatis.

Differs from var. *marquesensis* in having the leaves elliptic-lanceolate, sharply acuminate, up to 6 cm long, and at most 18 mm wide, attenuate at base.

Marquesas: Fatuhiva I.: 600 m, *Brown 932* (BISH, type).

***Alyxia stellata* var. *deckeri* Fosberg & Sachet, new var.**

Planta scandens lignosa, foliis late ovatis basin subcordatis vel cordatis; cymis maxime 4 cm longis; floribus maxime 6 mm longis, fructibus nigris segmentis subglobosis 12 × 10 mm.

Woody vine with leaves broadly ovate, subcordate to cordate at base; cymes to 4 cm long, flowers about 6 mm long; fruit segments subglobose, 12 × 10 mm, black.

Marquesas: Hiva Oa I.: Atuona-Feani Trail, crest of ridge in cloud forest, 1200–1300 m, *Sachet & Decker 1151* (US, type, P, BISH, NY, K).

Named for our colleague, Bryce G. Decker, student of Marquesan vegetation and one of the collectors of the type.

***Ochrosia* Juss. and *Neiosperma* Raf.**

In *Micronesica* 8:48–49, 1972, we published combinations in *Neiosperma* for plants hitherto placed in *Ochrosia*, but deferred discussing the reasons until the publication of a revision of the two genera which we have in preparation. As it now seems that completion of this revision will be delayed, a brief exposition of the reasons for the separation seems desirable to enable those concerned with species of *Neiosperma* to decide whether to take up this name.

It may first be pointed out that one reason for lack of understanding of these closely related genera is that most herbarium material of them, especially of *Neiosperma*, is incomplete and much of it poorly preserved. Mature fruits are large and usually not mounted on herbarium sheets. The best characters are in the endocarps, which do not show well unless the fruit has lost the fleshy pericarp by lying on the ground and decaying or being gnawed by hermit crabs or cleaned by insects or weathering. The flesh adheres tightly when dry. The inflorescences tend to disarticulate, thus losing the rather subtle characters that distinguish the two genera in a younger condition. Great care in the selection and preparation of specimens is a desideratum in this as well as other tree genera of Apocynaceae.

The fruits of both genera are paired drupes, attached to the receptacle, either separate or somewhat connate at base, rarely in *Ochrosia*, especially in *O. ackeringae* of Malesia, connate in the lower fifth or even higher. These drupes are commonly much longer than broad and divergent to varying degrees, in some species, especially of *Neiosperma*, to 180° or even somewhat reflexed. In *Ochrosia* the drupes are usually somewhat dorsiventrally compressed, and the endocarps (with exception of some material of *O. compta* K. Schum.) always so. In *Neiosperma*, the drupe is round in transverse section and the stones are never compressed. The endocarp of *Ochrosia* has the surface almost smooth, though apparently of fused fibers, or with

large holes (cavernous). That of *Neiosperma* is covered by fibrous to spinelike or horn-like distally directed processes. These gave rise to the sectional name given to this taxon, *Ochrosia* sect. *Echinocaryon* F. v. M. These spiny endocarps strongly suggest those of the genus *Cerbera* and when cast up as drift on beaches the two may be confused. It seems possible that *Neiosperma* may be at least as closely related to *Cerbera* L. as to *Ochrosia*, but a firm decision on this must await a better understanding of the inflorescence architecture of the three genera, especially that of *Cerbera*.

The inflorescences of *Ochrosia* and *Neiosperma* differ, but in ways much less easily described than those in the fruits. The young axillary inflorescence of *Ochrosia* is already dichotomously or trichotomously branching when still very small. *Neiosperma* produces short axillary branchlets, with one to several cymes and one or more vegetative buds appearing at the terminal node of such a branchlet. The peduncles produce an irregular whorl of branches. These may branch again or not, before starting to flower. The flowers are produced spirally, crowded, and continuously on a thickened slowly elongating axis covered with scars. Each bud is on a very short pedicel with ephemeral scale-like bracts. Flowering ceases when one flower sets fruit. The flowering branchlets of *Ochrosia* cymes, on the other hand, tend to elongate in a zigzag fashion, the new pedicel appearing just below the flower on the previous one. Thickened ultimate branches, crowded with flower scars seem not to occur on *Ochrosia*, but are known from a number of other Apocynaceous genera.

Previous workers who divided the inclusive genus *Ochrosia* have all mistakenly applied the name *Ochrosia* to what is here called *Neiosperma*. The late M. Pichon, in 1947, discussed the treatments by Koidzumi, Markgraf and Valetton and pointed out that the genus was founded on the Mascarene *O. maculata* Jacq. (= *O. borbonica* Gmel.), hence the name *Ochrosia* must be applied to the group with cavernous endocarp, variously called *Bleekeria* Hassk. or *Excavatia* Markgr., rather than to that with spiny endocarp, called *Ochrosia* by these workers. We concur fully with this view. Pichon, however, treated the whole complex as one genus. In our opinion the characters discussed above amply justify recognition of two genera. The inflorescence has been studied in detail in very few species and it is not certain that the characters given will hold up throughout the 30 or more known species of the two groups. The concept of the *Neiosperma* inflorescence presented here is largely based on study of living material of *N. oppositifolia* (Lam.) Fosb. & Sacht.

***Morinda umbellata* var. *forsteri* (Seem.) Fosb., Sargentia 1:123, 1942.**

*Morinda forsteri* Seem., Fl. Vit. 129, 1866.

This liana may be recorded from Anaa in the Tuamotu Archipelago. The collection was somehow missed when the Rubiaceae of the Mangarevan Expedition were worked up and published in Occ. Pap. Bishop Mus. 13:245-293, 1937. This species is a good example of the group of species characteristic of high islands that occur on atolls when there is some dissected limestone (*feo*) projecting slightly above the general level of the coral sand and gravel surface of the islets.

Tuamotu Archipelago: Anaa Atoll: Tukahora, in moist woods on dissected coral, *St. John 14259* (US, BISH).