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STUDIES OF PACIFIC ISLAND PLANTS, XXXIII. THE GENUS ASCARINA (CHLORANTHACEAE) IN THE SOUTHERN PACIFIC *

ALBERT C. SMITH

THE FAMILY Chloranthaceae (Swamy, 1953b) is of exceptional interest for the primitive characteristics of its xylem, which ranges from the vesselless condition demonstrated by *Sarcandra* (Swamy & Bailey, 1950) to a low level of specialization in *Chloranthus*, *Ascarina*, *Ascarinopsis* (Humbert & Capuron, 1955), and *Hedyosmum*. The nodal anatomy of some genera of the family cannot be assigned either to a strictly unilacunar type or to a typically trilacunar one, and the pollen grains show trends of aperture type from sulcate to inaperturate to polycolpate (Walker, 1974). Reproductive structures within the family are highly reduced and therefore phylogenetically advanced in comparison to those of many other ranalean families. The component genera are morphologically sharply separable and usually have discrete ranges. One may assume that the Chloranthaceae are today represented by isolated remnants of a once diverse, widespread, and ancient assemblage of angiosperms, in which extinction has played a major role in narrowing the diversity of the few surviving representatives. The family is often ordinarily assigned to either the Piperales or the Laurales, but its range of characters, some of which are extremely primitive even for those orders, together with its wide distribution and the discreteness of its surviving genera, suggests that it is best assigned to its own order Chloranthales. I would now prefer this modification of my previous assignment of the family to the Laurales, suborder Monimiineae (Smith, 1972). Walker (1976) has also pointed out the isolation of the family by recognizing it as the sole component of the suborder Chloranthineae of the order Piperales.

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Ascarina J. R. & G. Forster

My present concern with the Chloranthaceae stems from a need to clarify the nomenclature of taxa of *Ascarina* occurring in the Fijian Region. Dr. W. R. Sykes, of the Department of Scientific and Industrial Research, Christchurch, has kindly called to my attention the fact that the mid-Pacific species extending from the Solomon Islands to at least the Cook Islands was incorrectly assigned by Swamy (1953a) to *A. lanceolata* Hooker f. While investigating this situation I observed other aspects of Swamy's treatment which require adjustment, useful as it is in its major features.

(1) Swamy, like earlier students of *Ascarina*, described the genus as dioecious. While in general this is certainly the case, the occurrence of monoecy must be pointed out in at least two specimens collected in the New Hebrides. One of these, *Kajewski 152*, assigned by Swamy to *A. lanceolata* var. *smithii* (herein placed in *A. swamyana*), bears ♂ and ♀ inflorescences; however, these inflorescences occur on separated branchlets and therefore it is possible (although unlikely) that Kajewski's material came from two different plants. The second specimen, *Bernardi 12913* (not available to Swamy and herein placed in *A. diffusa*), bears ♂ and ♀ inflorescences on the same branchlet, and therefore the occurrence of monoecy is unquestionable and should be noted by future students of the genus.

(2) Swamy noted that the seven species recognized by him fall into two groups, one a predominantly western Pacific group with a single flower-subtending bract and a ♂ flower with two stamens, the other a predominantly eastern Pacific group with three flower-subtending bracts (two of which may be considered as lateral bracteoles) and a ♂ flower with a single stamen. The two groups are said to overlap only in the Solomon Islands and New Caledonia. However, Swamy failed to note that a Marquesan specimen, *Quayle 1319* (which he cited as *A. lanceolata*), falls into his "western" group and therefore minimizes the significance of the assumed geographic segregation. In the present treatment I consider the Marquesan element to represent a new species, *A. marquesensis*.

(3) The only really egregious flaw in Swamy's treatment is his failure to typify correctly *A. lanceolata* Hooker f., the holotype of which was seen by him and listed without recognition as *A. lucida* Hooker f. This holotype, *MacGillivray 982*, comes from the Kermadec Islands. Unaccountably Swamy designated a Rarotongan specimen, *Parks 22521*, as a topotype of *A. lanceolata*, to which he assigned a range extending from the Solomon Islands to the Societies and Marquesas. Since *A. lanceolata* is now seen to be a Kermadec Island endemic (whether as a species or a variety), the more widespread tropical Pacific species is left without a name unless one interprets it to include the Raiatean *A. subfalcata* J. W. Moore, as Swamy did.

(4) In fact, however, reexamination of the holotype of *A. subfalcata*

indicates it to be specifically distinct from the comparatively frequent species extending from the Solomons to the Cook Islands. The latter taxon I am herein interpreting as a new species, *A. diffusa*.

(5) The modifications here suggested increase *Ascarina* in size from seven to eleven species. Although I have studied only the tropical Pacific species in detail, I believe that at present it is desirable to avoid the use of trinomials in *Ascarina*, which merits a much more detailed review. Nomenclatural changes herein proposed include (a) establishment of the Marquesan taxon as a distinct species, (b) reestablishment of *A. subfalcata* as an endemic species from Raiatea, (c) description as a new species of a comparatively widespread Pacific taxon occurring from the Solomons to Rarotonga, (d) elevation to specific level of *A. "lanceolata"* var. *smithii* Swamy under the name *A. swamyana*, and (e) reestablishment of *A. lanceolata* as a Kermadec Island endemic species distinct from the New Zealand *A. lucida*. I herewith suggest modifications of Swamy's key to species and append comments on nomenclature, typification, and distribution, although only the species that affect my interpretation of those of the Fijian Region are treated in detail.

KEY TO SPECIES

Flowers subtended by a single bract (lateral bracteoles rarely present); ♂ flowers with two collateral stamens (rarely with a third, partially developed, adaxial stamen); endocarp (as far as known) comparatively smooth.

Inflorescences with congested flowers or fruits, the branches (or simple spikes of axillary inflorescences) 0.5–2 cm. long, the flowers or fruits essentially contiguous, rarely separated on the rachis by more than 2 mm.

Leaf blades elliptic to oblong, $3.2\text{--}14 \times 1.5\text{--}8.5$ cm., about twice as long as broad; branches of the terminal compound spike several, usually spreading from a central axis; flower-subtending bracts ovate, sometimes to 1.5 mm. long; lateral bracteoles absent; anthers about 3 mm. long and 1–1.5 mm. broad, subacuminate at apex by a projecting connective; Philippines, Borneo, and New Guinea.

1. *A. philippinensis*.

Leaf blades lanceolate to narrowly elliptic, $3.5\text{--}9 \times 1\text{--}4$ cm., more than twice as long as broad; branches of the central axis of the terminal compound spike 1 or 2, subscending; flower-subtending bracts broadly deltoid to reniform, 0.6–1 mm. long, obtuse or rounded at apex; lateral bracteoles occasionally present and then shared by two contiguous flowers; anthers 1.2–2 mm. long and 0.6–0.9 mm. broad, obtuse at apex; Marquesas Islands.

2. *A. marquesensis*.

Inflorescences with flowers or fruits comparatively spaced on the rachis, with 5–8 branches 1.5–3.5 cm. long, the flowers or fruits often separated by 2–8 mm.

Leaf blades ovate to obovate, $5\text{--}14 \times 2\text{--}8$ cm., comparatively finely crenate-serrate, the teeth 3–7 per centimeter; flower-subtending bracts deltoid or broadly lanceolate, 0.5–1.5 mm. long; Solomon Islands and New Britain.

3. *A. maheshwarii*.

Leaf blades lanceolate, $4\text{--}9 \times 1\text{--}3.5$ cm., coarsely crenate-serrate, the teeth

- 2-5 per centimeter; flower-subtending bracts deltoid to lanceolate, 1-2 mm. long; New Caledonia. 4. *A. solmsiana*.
- Flowers subtended by a bract and two lateral bracteoles (or, when the ♀ flowers are paired and subtended by a single bract, then each with three bracteoles); ♂ flowers with a single stamen (and sometimes with a rudimentary adaxial pistil); endocarp (as far as known) verrucose or papillate. Inflorescence branches or individual spikes (2-)3-11 cm. long at maturity, each with 25-100 flowers.
- Pistillate flowers single (only very rarely, in one specimen of species no. 6, known to be sometimes paired); leaf blades attenuate at base and long-decurrent on petiole.
- Petioles 1-10 mm. long, the leaf blades broadly elliptic or elliptic-obovate, usually $3.5-10 \times 2-8$ cm., averaging about twice as long as broad, obtuse to rounded at apex, sometimes slightly emarginate, rarely subacute, with (2-)3-5 crenations per centimeter; Society Islands. 5. *A. polystachya*.
- Petioles (4-)5-27 mm. long, the leaf blades lanceolate or narrowly elliptic, usually $6-14.5 \times 1.5-4.5$ cm., (2.5-)3-4 times as long as broad, bluntly acuminate at apex, with (2-)3-8 crenations per centimeter; Solomon Islands to Cook Islands. 6. *A. diffusa*.
- Pistillate flowers in pairs, each pair subtended by a single bract and each flower by three subequal bracteoles; petioles (10-)12-30 mm. long, the leaf blades elliptic, usually $5-12 \times 2.5-5$ cm., 2-2.5 times as long as broad, acute at base, obtusely cuspidate or acuminate at apex, with 2 (or 3) conspicuous crenations per centimeter; New Hebrides and Fiji. 7. *A. swamyana*.
- Inflorescence branches or individual spikes 1.2-3 cm. long at maturity, each with 10-50 flowers.
- Flower-subtending bracts deltoid to ovate, attached to rachis at basal margin only, free on lateral margins; inflorescences with 4 or more lateral branches, not spicate; flowers comparatively spaced, sometimes disclosing 1-3 mm. of the rachis.
- Leaf blades elliptic, usually $2.5-6 \times 1.5-3.5$ cm., averaging about twice as long as broad, callose-acute at apex, coarsely serrate with 2-4 conspicuous antrorsely projecting teeth per centimeter; inflorescences mostly terminal, with 4-8 lateral branches; New Zealand. 8. *A. lucida*.
- Leaf blades lanceolate, usually $5-11.5 \times 1-3$ cm., 3-5 times as long as broad, short-acuminate at apex.
- Margins of leaf blades coarsely serrate; inflorescences mostly terminal; Kermadec Islands. 9. *A. lanceolata*.
- Margins of leaf blades crenate-serrate with 3-6 teeth per centimeter; inflorescences mostly axillary, with 4 or 5 lateral branches; New Caledonia. 10. *A. rubricaulis*.
- Flower-subtending bracts semipoculiform at anthesis; inflorescences axillary and terminal (if axillary, spicate in ultimate leaf axils; if terminal, 3-branched from base, the central branch 2-parted at apex of a short peduncle); flowers congested, essentially contiguous, rarely separated on the rachis by more than 1 mm.; leaf blades lanceolate to oblanceolate, $4-7 \times 1-2$ cm., 3-4 times as long as broad, obtuse at apex, inconspicuously crenate with 3-5 crenations per centimeter, the petioles 2-4 mm. long; Society Islands. 11. *A. subfalcata*.

1. *Ascarina philippinensis* C. B. Robinson in Philipp. Jour. Sci. Bot. 4: 70. 1909; Swamy in Proc. Nat. Inst. Sci. India 19: 375. fig. 2. 1953.

Ascarina reticulata Merr. in Philipp. Jour. Sci. Bot. 12: 263. 1917.

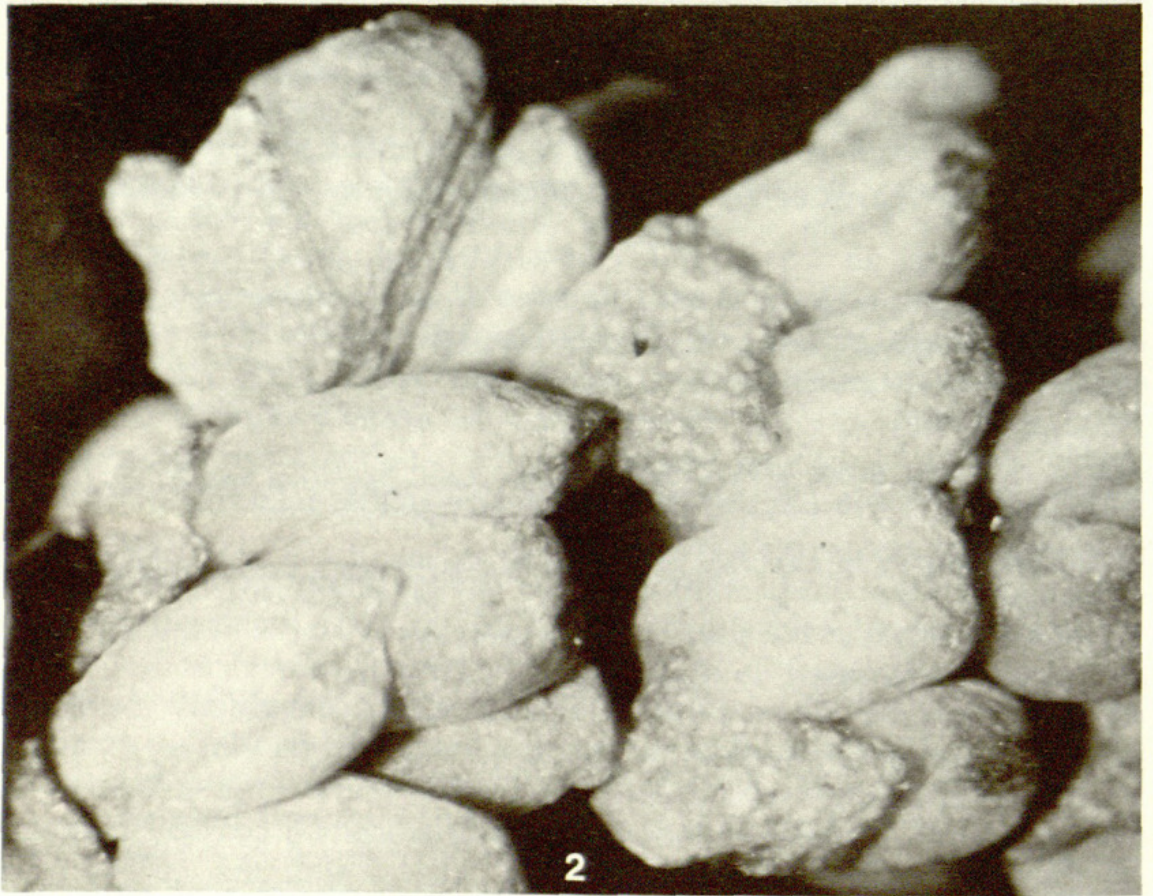
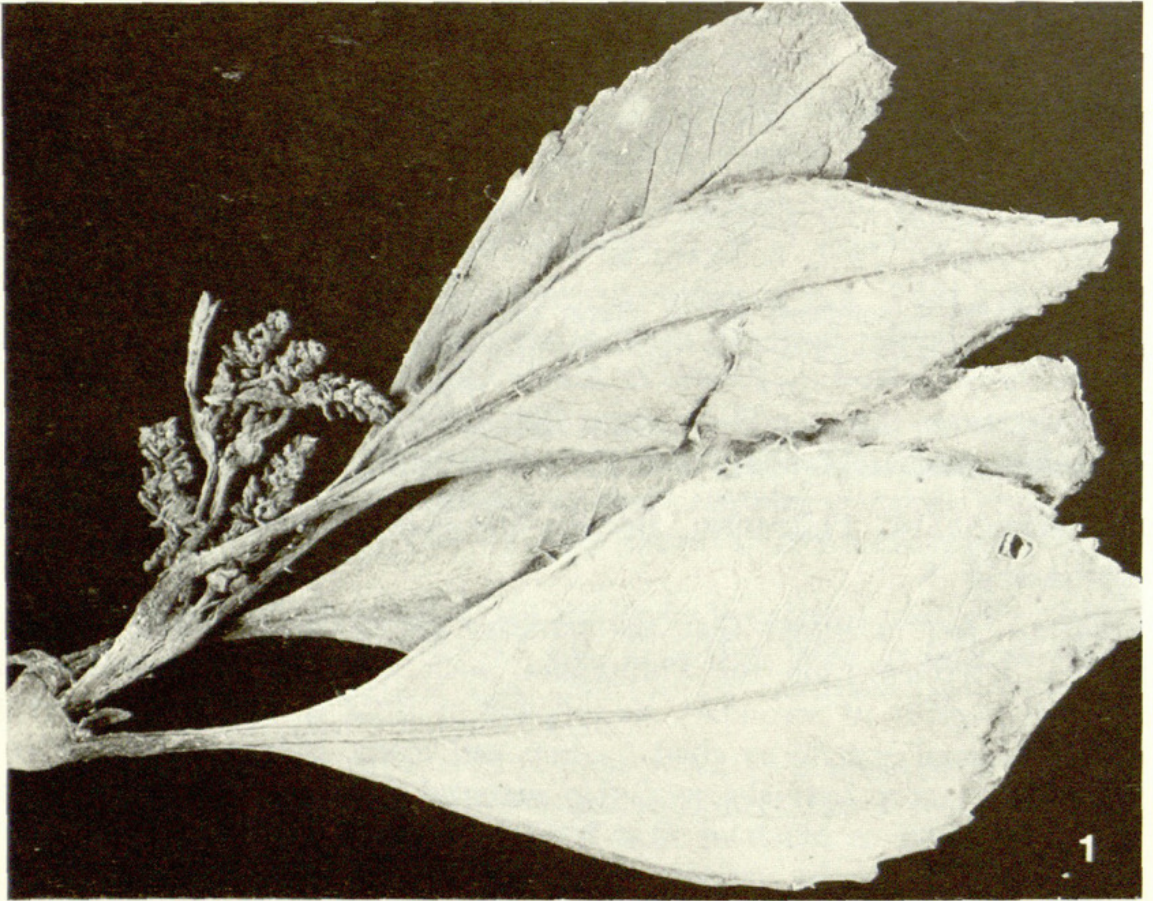
TIPIFICATION AND NOMENCLATURE. The holotype of *A. philippinensis*, R. S. Williams 2541, collected on Mt. Apo, Mindanao, Philippines, on March 31, 1905, was probably destroyed in the Bureau of Science herbarium at Manila; however, isotypes are available at K and NY. *Ascarina reticulata* is typified by Ramos & Edaño (Philipp. Bur. Sci.) 26399, from Mt. Umingan, Luzon, Philippines; the holotype has presumably also been destroyed at Manila, but isotypes are deposited at A, K, and US.

DISTRIBUTION. Philippines, Borneo, and New Guinea, at elevations of 400 to 2,800 m.

Swamy has indicated that the putative differences between the two species described from the Philippines, such as leaf texture and color and the number of secondary nerves, are of little consequence. Having examined most specimens cited by him and many additional ones, I am inclined to agree that the available material from the Philippines and Borneo, as well as much of that from New Guinea, represents a single species. However, the variation in New Guinea is such that a detailed study should eventually be made to determine whether more than one New Guinean species in the group of *Ascarina* with two stamens should be recognized.

2. *Ascarina marquesensis* A. C. Smith, sp. nov. FIGURES 1-4.

Arbor dioecia ad 1.5 m. alta, trunco ad 8 cm. diametro, ramulis subteretibus apicem versus 2-4 mm. diametro ad nodos incrassatis, petiolorum basibus in vaginam 3-4 mm. longam connatis, stipulis veris minutis lanceolatis; petiolis gracilibus 5-20 mm. longis praeter basim anguste alatis, foliorum laminis subcoriaceis lanceolatis vel anguste ellipticis, 3.5-9 cm. longis, 1-4 cm. latis, basi attenuatis et in petiolum longe decurrentibus, apice subacutis vel obtusis saepe recurvato-callosa-emarginatis, margine praeter basim versus conspicue callosa-serratis, dentibus plerumque 4 vel 5 per centimetrum, costa supra subtiliter sulcata subtus prominenti, nervis secundariis subpatentibus utrinsecus 8-12 ut rete venularum utrinque prominulis; inflorescentiis ♂ solum visis terminalibus et nodos distales axillaribus, ubi axillaribus spicatis, ubi terminalibus compositis 3-5-ramosis, ramulis lateralibus spicatis et ad basim liberis, ramulo centrali interdum ramulos 1 vel 2 breves gerenti, spicis vel ramulis breviter pedunculatis 5-15 mm. longis et 15-20-floris, floribus congestis admodum contiguus; bractea sub flore late deltoidea, 0.6-1 mm. longa, 0.8-1.5 mm. lata, copiose glandulosa, apice obtusa vel rotundata, margine plerumque integra interdum suberosa; bracteolis lateralibus inter flores contiguos interdum praesentibus anguste ovatis vel lanceolatis ad 1.5 × 0.5 mm. sed plerumque minoribus;



FIGURES 1, 2. *Ascarina marquesensis* (from *Quayle 1319*): 1, tip of branchlet with ♂ inflorescences, $\times 2$; 2, flowers on a portion of a ♂ spike, $\times 30$.

staminibus 2 (raro 3, tertio tum parvior et adaxiali), antheris oblongis, 1.2–2 mm. longis, 0.6–0.9 mm. latis, basi et apice obtusis.

TIPIFICATION AND NOMENCLATURE. The type of the new species is *E. H. Quayle 1319*, from the Marquesas Islands. In citing this collection as *A. lanceolata* (*A. diffusa* in the present treatment), Swamy failed to note that its ♂ flowers have two (and rarely even three) stamens, a fact which excludes it from his "Group II." *Quayle 1319* further differs from *A. diffusa* in its short, congested, and few-flowered inflorescences.

DISTRIBUTION. Apparently endemic to the Marquesas and known to me only from the type collection, *A. marquesensis* is evidently a rare species. Quayle noted that he saw it only twice on the same ridge on the island of Nuku Hiva. Fosberg and Sachet (in *Micronesica* 8: 43. 1972) mention a second Marquesan collection, *Sachet & Decker 1181*, from Hiva Oa, as representing *A. polystachya*. I have not seen this collection, which is not currently in the herbaria at BISH and US as indicated, but it may well represent the new species.

Marquesas Islands. NUKU HIVA: Hakaui upper plains, alt. 945–1,005 m., in moist, shady places on the side slope of a *Freycinetia*-covered ridge, Oct. 10, 1922 (bark smooth, burnt sienna in color; wood white, brittle), *Quayle 1319* (BISH, holotype; isotype also at BISH).

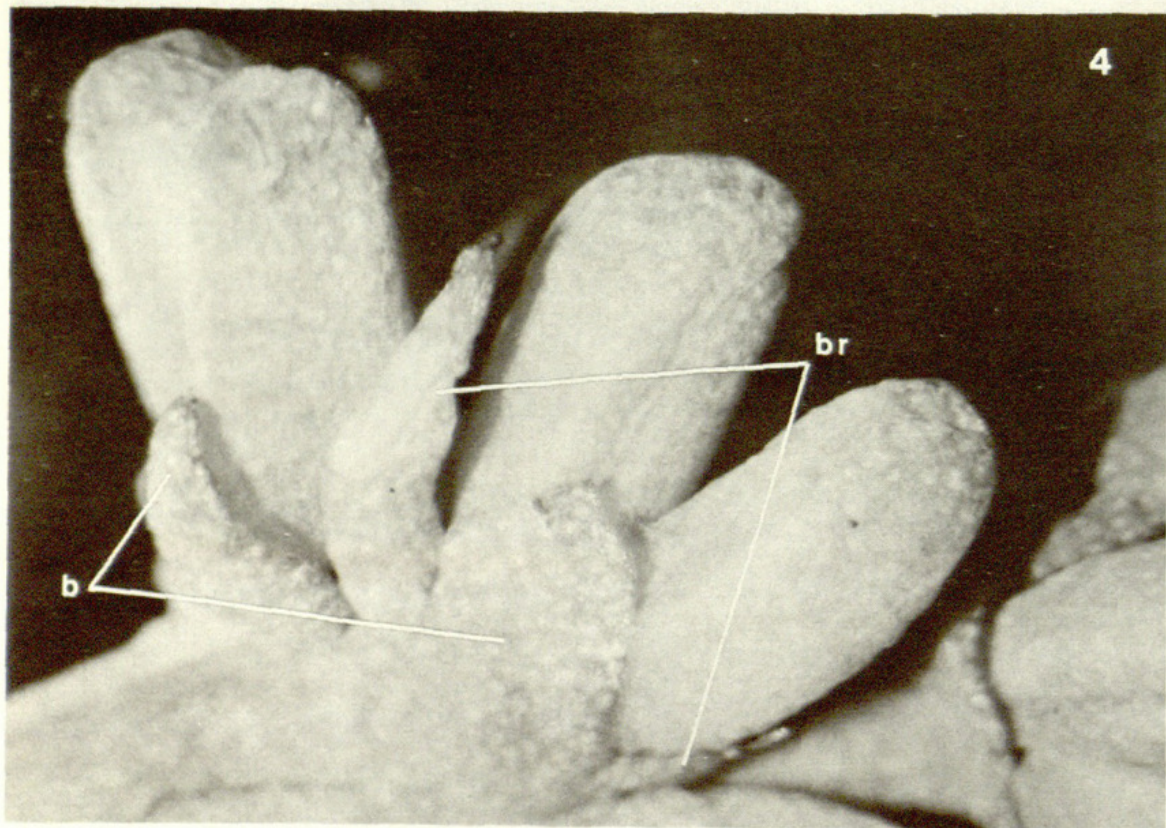
As a member of Swamy's "Group I," *A. marquesensis* seems related only to *A. philippinensis*, from which it differs in its proportionately narrower leaf blades, its comparatively few-branched inflorescences, and its anthers, which are smaller and obtuse at apex rather than subacuminate and with an obvious projecting connective. F. B. H. Brown (in *Bishop Mus. Bull.* 130: 99. 1935) cited *Quayle 1319* as representing his *Weinmannia marquesana* var. *glabrata* (in which it has no type status), but Martin L. Grant removed the specimen from the Cunoniaceae at BISH and suggested that it might represent a new species of *Ascarina*.

3. *Ascarina maheshwarii* Swamy in *Proc. Nat. Inst. Sci. India* 19: 377. fig. 3. 1953.

TIPIFICATION AND NOMENCLATURE. In describing this very distinct species, Swamy indicated *Kajewski 1681* (A) as the type of the ♀ plant and *Kajewski 2014* (A) as the type of the ♂ plant; both are from Bougainville. Since this procedure is not nomenclaturally permissible, and since the ♂ characters are perhaps more important in defining infragenetic relationships, I herewith designate *Kajewski 2014* (A) as the lectotype; isoelectotypes are available at BISH, BM, and US. These specimens and several others were annotated by Swamy with an unpublished epithet.

DISTRIBUTION. New Britain and the Solomon Islands, at elevations of 600 to 2,075 m. Specimens from other Solomon Islands than Bougainville and San Cristobal, cited by Swamy, are now available and are here cited.

Solomon Islands. KOLOMBANGARA: *R. S. S.* (*Corner*) 1195 (A, K), 1208 (A, K). GUADALCANAL: Monitor Creek, below Mt. Gallego, *R. S. S.* (*Whitmore*) 6035 (A, K); Popomanasiu, *R. S. S.* (*Corner*) 133 (A, K).



FIGURES 3, 4. *Ascarina marquesensis* (from *Quayle 1319*): 3, ♂ flower, showing two stamens subtended by a single bract, $\times 50$; 4, contiguous ♂ flowers, showing subtending bract and occasional lateral bracteoles, $\times 30$ (b = flower-subtending bract; br = lateral bracteole).

4. *Ascarina solmsiana* Schlechter in Bot. Jahrb. 39: 94. 1906; Swamy in Proc. Nat. Inst. Sci. India 19: 377. fig. 4. 1953.

TYPIIFICATION. The holotype, *Schlechter 15679*, collected in January, 1903, in New Caledonia, was probably destroyed at B, but isotypes are available at BM and K.

DISTRIBUTION. New Caledonia; Swamy cites only the type collection.

5. *Ascarina polystachya* J. R. & G. Forster, Char. Gen. Pl. 59. t. 59. 1775, ed. 2. 118. t. 59. 1776; Seem. Fl. Vit. 258. 1868; Drake, Ill. Fl. Ins. Mar. Pac. 277. 1892; Swamy in Proc. Nat. Inst. Sci. India 19: 379. fig. 7. 1953.

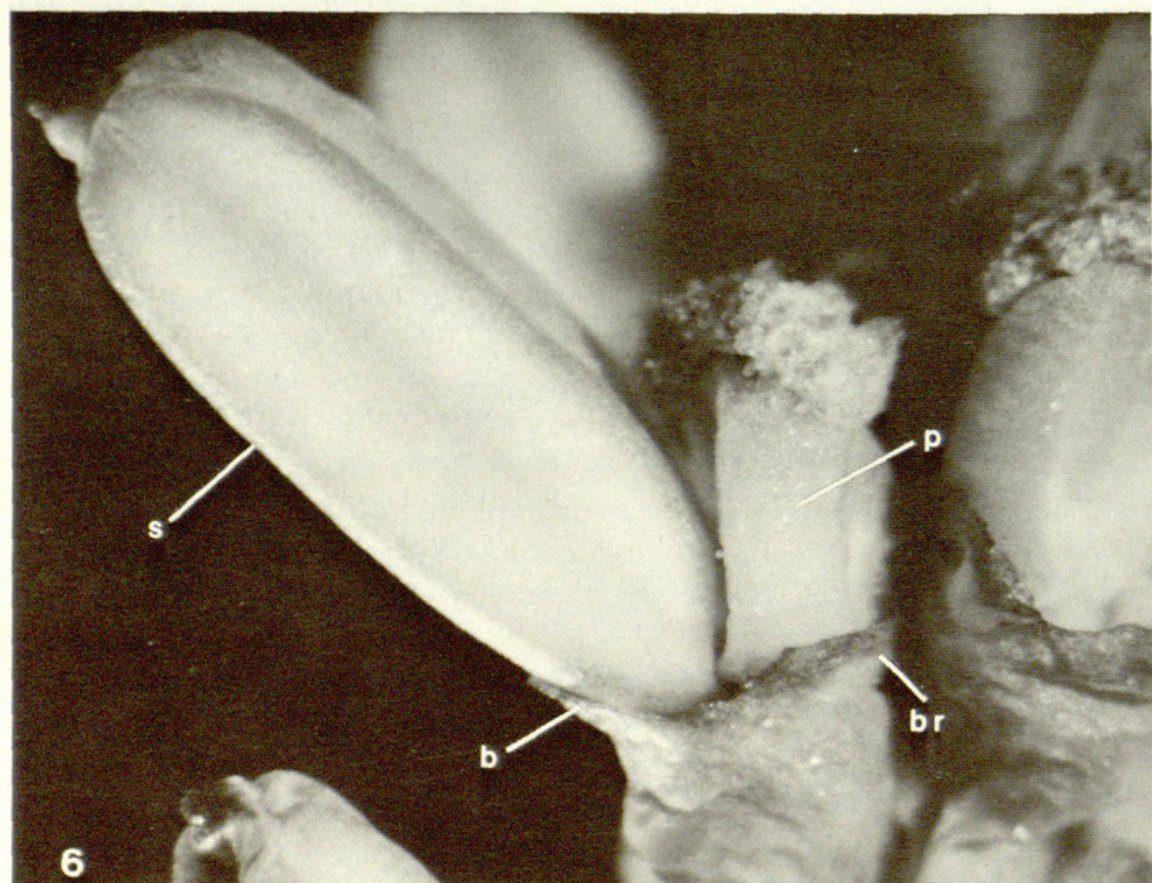
Ascarina raiateensis J. W. Moore in Occas. Pap. Bishop Mus. 10(19): 7. 1934.

TYPIIFICATION AND NOMENCLATURE. In proposing the genus and species the Forsters did not cite a specimen. Their illustration shows both ♂ and ♀ inflorescences and therefore would seem to have been based on at least two specimens. One of these, probably the ♀ specimen, was their own, which was listed by both Seemann and Drake. The ♂ specimen was presumably a Banks and Solander collection from the first Cook voyage. This is the specimen described by Solander in his manuscript Prim. Fl. Ins. Oc. Pac. 338 as *Psilotum serratum*, a binomial listed in synonymy by both Seemann and Drake. An illustration (t. 112) also exists among Parkinson's unpublished drawings. Since the Forsters in 1775 had access to the Banks and Solander collection, Solander's description, and Parkinson's drawing, and since the ♂ plant is perhaps more significant than the ♀, I herewith designate as lectotype of *A. polystachya* the BM specimen of *Banks & Solander*, collected in 1769 in Tahiti; an isolectotype is available at BISH.

The holotype of *A. raiateensis* is *Moore 178* (BISH), from Temehani Plain, Raiatea. I believe that Swamy's reduction of this to *A. polystachya* is correct. Moore indicates that his taxon differs from *A. polystachya* in its smaller, short-petiolate leaves, shorter inflorescences, and crowded fruits with more distinctly lobed stigmas. However, among the available Tahitian specimens are several that seem to agree precisely with Moore's type: *Grant 3764*, *4235*, *MacDaniels 1344*, and *U. S. Expl. Exped.* (GH, p. p., US 40535, p. p.; the material obviously came from more than one plant). Small, short-petiolate leaves do not seem particularly correlated with altitude.

DISTRIBUTION. Endemic to the Society Islands and thus far known only from Tahiti and Raiatea, at elevations of 400 to 1,650 m. A few additional specimens not listed by Swamy are here cited.

Society Islands. TAHITI: Mt. Aorai and vicinity, *Fosberg & Sachet 54704* (GH, NY, US), *Gillett 2241* (BISH), *Grant 3764* (A, BISH), *Webster 15272* (BISH,



FIGURES 5, 6. *Ascarina diffusa* (5 from *Christophersen 571*, 6 from *Bernardi 12913*): 5, tip of branchlet with ♀ inflorescences, $\times \frac{1}{2}$; 6, ♂ flower, showing subtending bract, a lateral bracteole, the solitary stamen, and a sterile pistil, $\times 30$ (b = flower-subtending bract; br = lateral bracteole; s = stamen; p = pistil).

DAV); Mt. Orofena, *Grant* 4235 (BISH); Lake Vaheria, *MacDaniels* 1272 (BISH), 1615 (BISH); Mt. Roniu, *Grant* 3918 (BISH).

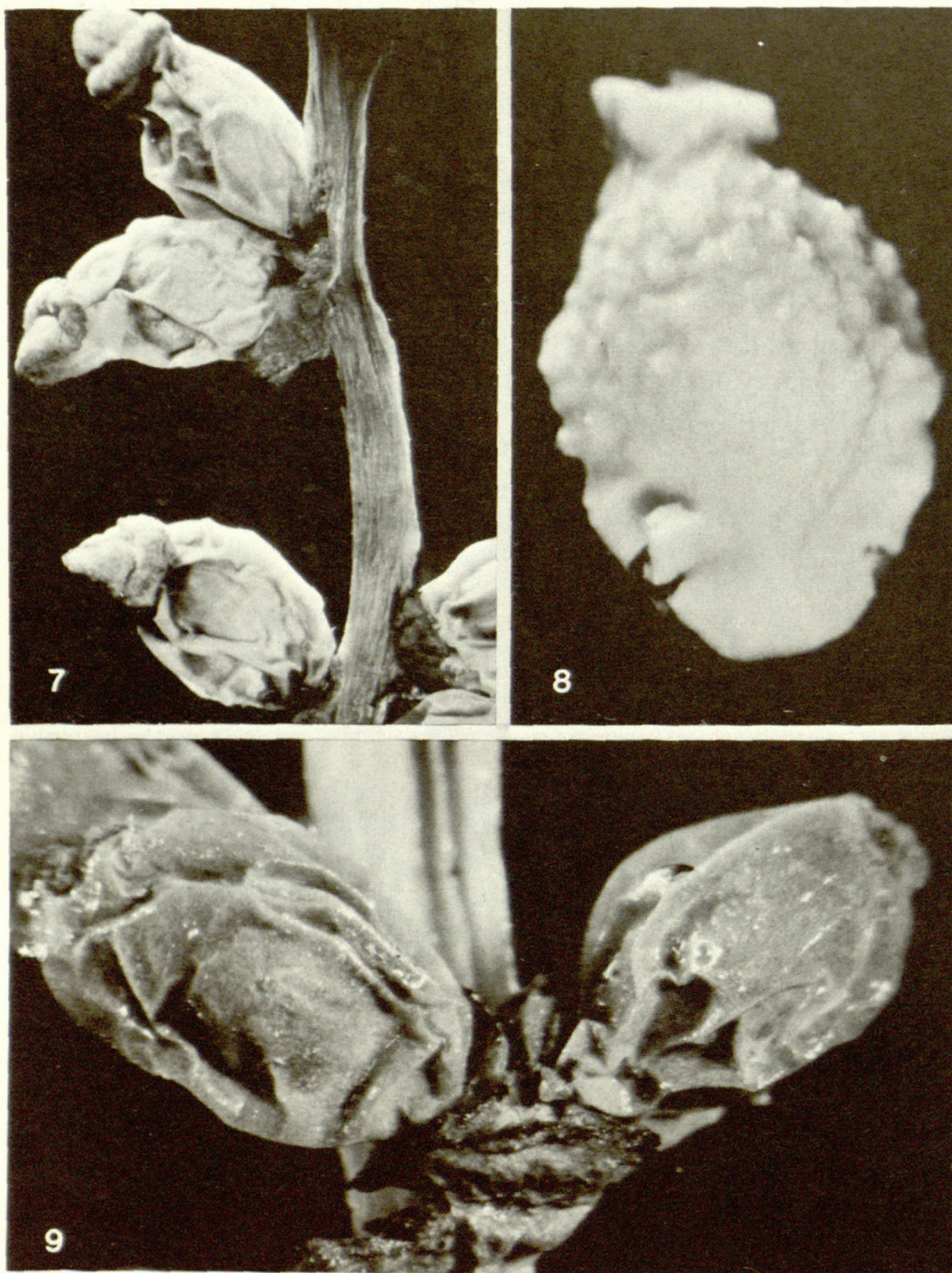
6. *Ascarina diffusa* A. C. Smith, sp. nov.

FIGURES 5-10.

Ascarina lanceolata sensu Drake, Ill. Fl. Ins. Mar. Pac. 277, quoad spec. Ins. Sam. 1892; Swamy in Proc. Nat. Inst. Sci. India 19: 377, excl. spec. Ins. Soc. et Marq. fig. 5. 1953; J. W. Parham, Pl. Fiji Isl. ed. 2. 311, quoad var. *lanceolata*. 1972; non Hooker f.

Arbor dioecia vel raro monoecia 4-12(-25) m. alta, ramulis subteretibus apicem versus 1.5-2.5 mm. diametro ad nodos incrassatis, petiolorum basibus in vaginam 1-3 mm. longam connatis, stipulis veris lanceolatis 2-3 mm. longis; petiolis gracilibus (4-)5-27 mm. longis praeter basim anguste alatis, foliorum laminis subcoriaceis lanceolatis vel anguste ellipticis, (4.5-)6-14.5 cm. longis, (1-)1.5-4.5 cm. latis, plerumque 3-4-plo longioribus quam latioribus, basi attenuatis et in petiolum longe decurrentibus, apice obtuse acuminatis (apice ipso ultra dentem ultimum vulgo 5-15 mm. longo), margine praeter basim versus calloso-crenato-serratis, dentibus (2-)3-8 per centimetrum, costa supra subtiliter sulcata subtus prominenti, nervis secundariis patentibus vel adscendentibus utrinsecus 15-25 utrinque prominulis vel supra subplanis, rete venularum irregulariter anastomosanti utrinque prominulo vel subtiliter impresso; inflorescentiis terminalibus et nodos 1-3 distales axillaribus, ubi axillaribus spicatis, ubi terminalibus compositis 4- vel 5-ramosis et saepe bracteis lanceolatis subfoliaceis ad 6 mm. longis subtentis, ramulis lateralibus spicatis et ad basim plerumque liberis, ramulis 2 vel 3 centralibus pedunculo communi enatis, pedunculis primariis et secundariis 8-30 mm. longis, spicis vel ramulis (2-)3-11 cm. longis plerumque 50-100-floris (floribus ♀ inflorescentiae ramulis raro tantum 10), floribus laxè dispositis, rhachidis partibus nudis plerumque 2-6 mm. longis; bractea sub flore deltoidea, 0.5-1 mm. longa, 0.5-1.2 mm. lata, obscure glandulosa, apice subacuta vel rotundata, bracteolis lateralibus 2 similibus sed parvioribus 0.2-0.9 mm. longis latisque; stamine in floribus ♂ solitario, pistillo adaxiali sterili oblongo ad 1 × 0.5 mm. cum stigmate bilobato conspicuo interdum praesenti, anthera oblonga, 2-3 mm. longa, 0.8-1.2 mm. lata, basi obtusa, apice 0.2-0.3 mm. longo conspicue mucronata; floribus ♀ ut ♂ bractea unica et bracteolis 2 subtentis, floribus ♀ contiguis rarissime bractea unica subtentis et tum utroque 3-bracteolato; pistillo ellipsoideo vel ovoideo post anthesin et fructu 2-3 mm. longo et 1.5-2 mm. lato, stigmate conspicuo 0.8-1.3 mm. lato, fructus endocarpio distaliter conspicue papillato basi rotundato vel obtuso apice obtuse projecto.

TYPEIFICATION AND NOMENCLATURE. The species here described as new was interpreted by Swamy as *A. lanceolata* Hooker f., but it must exclude the type collection of that species and also the material from the Society and Marquesas Islands cited by Swamy. As type of the new species I designate *Smith* 7887, a ♂ Fijian collection with many duplicates, cited below.



FIGURES 7-9. *Ascarina diffusa* (7 and 8 from *Christophersen 571*, 9 from *Parks 22521*): 7, portion of ♀ spike, $\times 10$; 8, endocarp, $\times 30$; 9, rare instance of paired ♀ flowers subtended by a single bract, $\times 20$.

DISTRIBUTION. Uncommon in mountainous areas from the Solomon Islands (Bougainville) to the Cook Islands (Rarotonga), reported from forests or open crests at elevations of 350 to 1,825 m. (to 1,825 m. on Bougainville, 900 m. on Tanna, 500 m. on Ngau, 1,600 m. on Savaii, 680 m. on Upolu, and nearly 1,000 m. on Rarotonga).

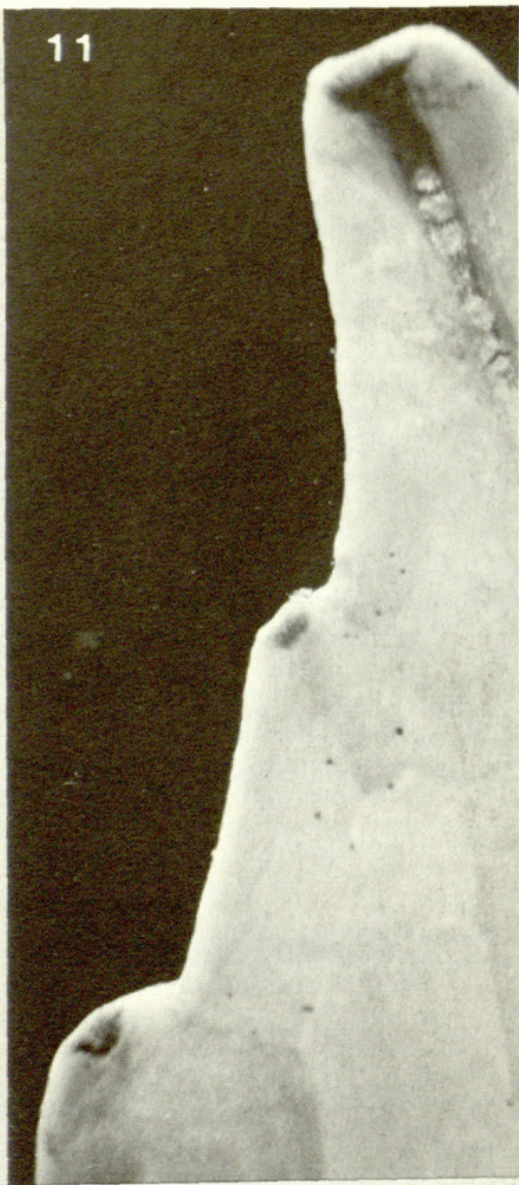


FIGURE 10. *Ascarina diffusa* (from *Smith* 7887): lower surface of apical portion of leaf blade, $\times 10$. FIGURES 11, 12. *Ascarina swamyana* (from *Smith* 908): 11, lower surface of apical portion of leaf blade, $\times 10$; 12, tip of branchlet with ♀ inflorescences, $\times \frac{1}{2}$.

LOCAL NAMES. Recorded local names are *langolango* (Fiji), *togo vau* or *fiti* (Samoa), and *kaiatea* (Rarotonga).

Solomon Islands. BOUGAINVILLE: Lake Luralu, Koniguru, Buin, *Kajewski* 2173 (A, BISH); Lake Loloru and rim of crater, *Schodde & Craven* 3915 (A, K, US), *NGF (Lavarack & Ridsdale)* 31407 (A, K). New Hebrides. TANNA: mountains in vicinity of Lamwinaoura, *Bernardi* 12913 (G, US); in montane forests, *Bernardi* 13132 (A, G, US). ANEITYUM: above Anelgauhat Bay, *Kajewski* 863 (A, BISH, K, NY, US). Fiji. VITI LEVU: without further locality, *Graeffe* (K). NGAU: northern spur of Mt. Ndelaitho, toward Navukailangi, June 22, 1953, *Smith* 7887 (US 2190693, holotype; isotypes at BISH, GH, K, L, NY, P, S, SUVA, UC). FIJI, without further locality, *U. S. Expl. Exped.* (GH, K, US 40438). Samoa. SAVAI: Mt. Maugaloa, *Vaupel* 494 (BISH, K, NY, US); above Matavanu, *Christophersen & Hume* 1996 (BISH, US), 2014 (A, BISH, US), 2153 (BISH, US), 2167 (K, NY); Tuisivi Range, *Christophersen* 820 (BISH, K, NY). UPOLU: Mt. Fao, *Christophersen* 571 (A, BISH). SAMOA, without further locality, *Whitmee* (GH), 93 (K), *Powell* 237 (K). Cook Islands. RAROTONGA: Mt. Ikurangi, *Wilder* 827 (BISH), *Philipson* 10257 (US); Mt. Manngotia, *H. E. & S. T. Parks* 22248 (K, UC, US), 22521 (BISH, GH, K, NY, UC, US); in mountains, *Cheeseman* 645 (K).

As noted by Swamy, the δ flower of this species occasionally bears an incipiently developed, adaxially placed pistil; such flowers have been seen on specimens from the New Hebrides (*Bernardi* 12913) and Fiji (*U. S. Expl. Exped.*, *Smith* 7887). It must also be noted that the primary character separating this species from the next (*A. swamyana*), relative to the single or paired φ flowers, is not absolute. On a single collection of *A. diffusa* from Rarotonga (*Parks* 22521) gradations have been noted in this character from the usual φ flower to contiguously appressed φ flowers (each still subtended by its own bract) to a rare situation in which two contiguous φ flowers are subtended by a single bract (FIGURE 9).

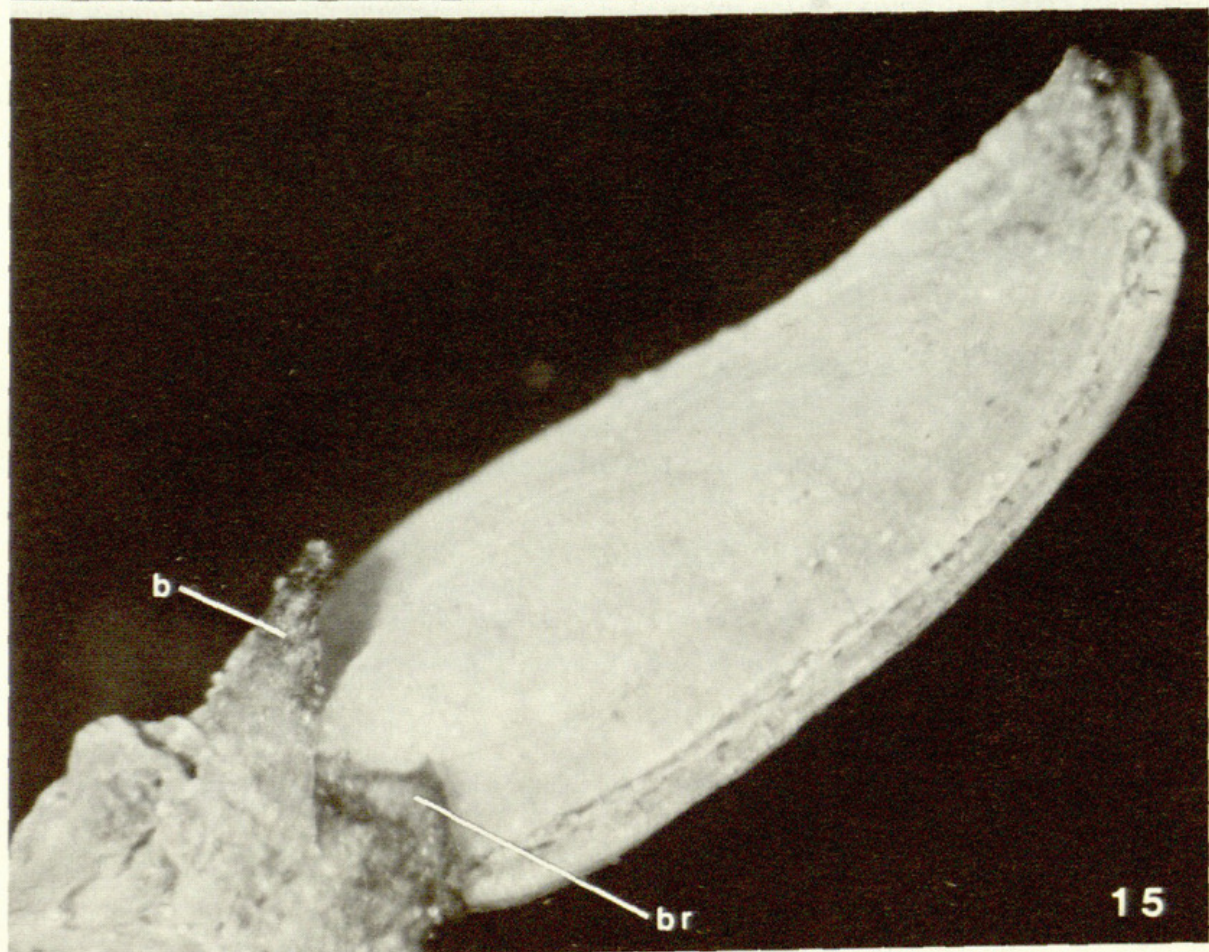
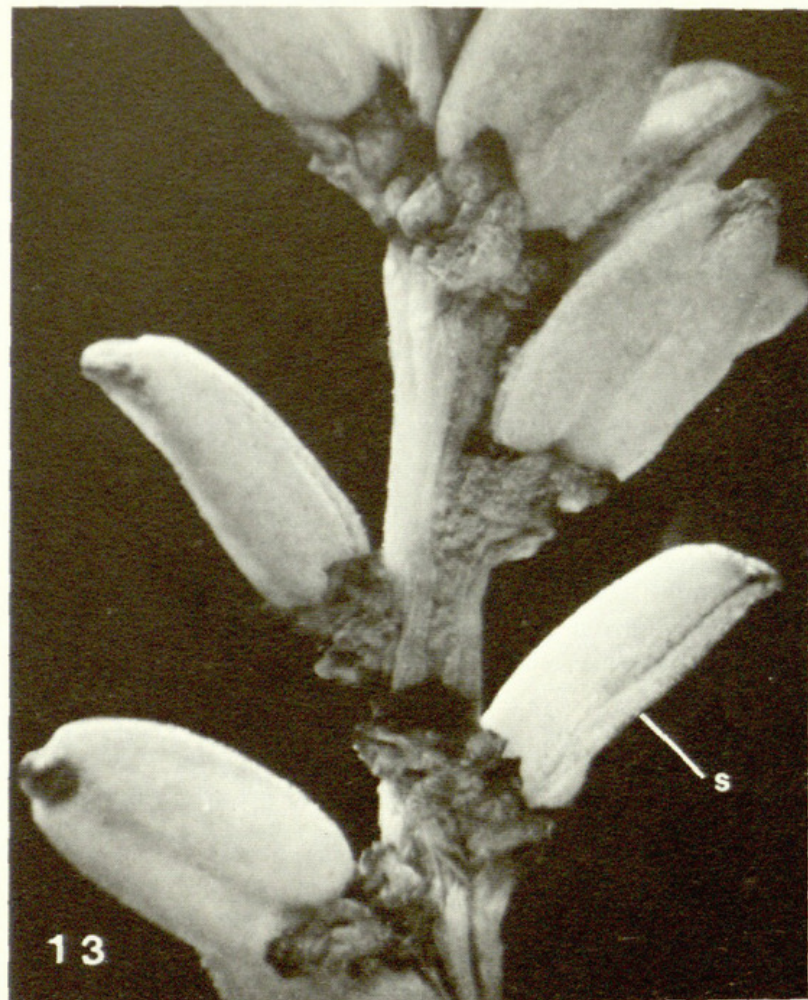
7. *Ascarina swamyana* A. C. Smith, sp. nov.

FIGURES 11–17.

Ascarina lanceolata sensu Seem. in Bonplandia 9: 259. 1861, Viti, 442. 1862, Fl. Vit. 258, p. p. t. 74, solum quoad fig. 4. 1868; Drake, Ill. Fl. Ins. Mar. Pac. 277, quoad spec. Ins. Vit. 1892; J. W. Parham, Pl. Fiji Isl. 223. 1964; non Hooker f.

Ascarina lanceolata var. *smithii* Swamy in Proc. Nat. Inst. Sci. India 19: 378. fig. 6. 1953; J. W. Parham, Pl. Fiji Isl. ed. 2. 311. 1972.

Arbor gracilis dioecia vel raro monoecia 5–10 m. alta, ramulis subteretibus apicem versus 1.5–3 mm. diametro ad nodos incrassatis, petiolorum basibus in vaginam 2–3 mm. longam connatis, stipulis veris minutis lanceolatis; petiolis gracilibus (10–)12–30 mm. longis canaliculatis apicem versus anguste alatis, foliorum laminis subcoriaceis ellipticis, (4–)5–12 cm. longis, (2–)2.5–5 cm. latis, 2–2.5-plo longioribus quam latioribus, basi acutis et in petiolum breviter decurrentibus, apice obtuse callosis et cuspidatis vel acuminatis (apice ipso ultra dentem ultimum 3–15 mm. longo), margine praeter basim versus calloso-crenato-serratis, dentibus 2



FIGURES 13-15. *Ascarina swamyana* (from *Kajewski 152*): 13, portion of ♂ spike, $\times 10$ (s = stamen); 14, portion of ♀ spike, $\times 10$ (p = pistil); 15, ♂ flower, showing subtending bract, a lateral bracteole, and the solitary stamen, $\times 30$ (b = flower-subtending bract; br = lateral bracteole).

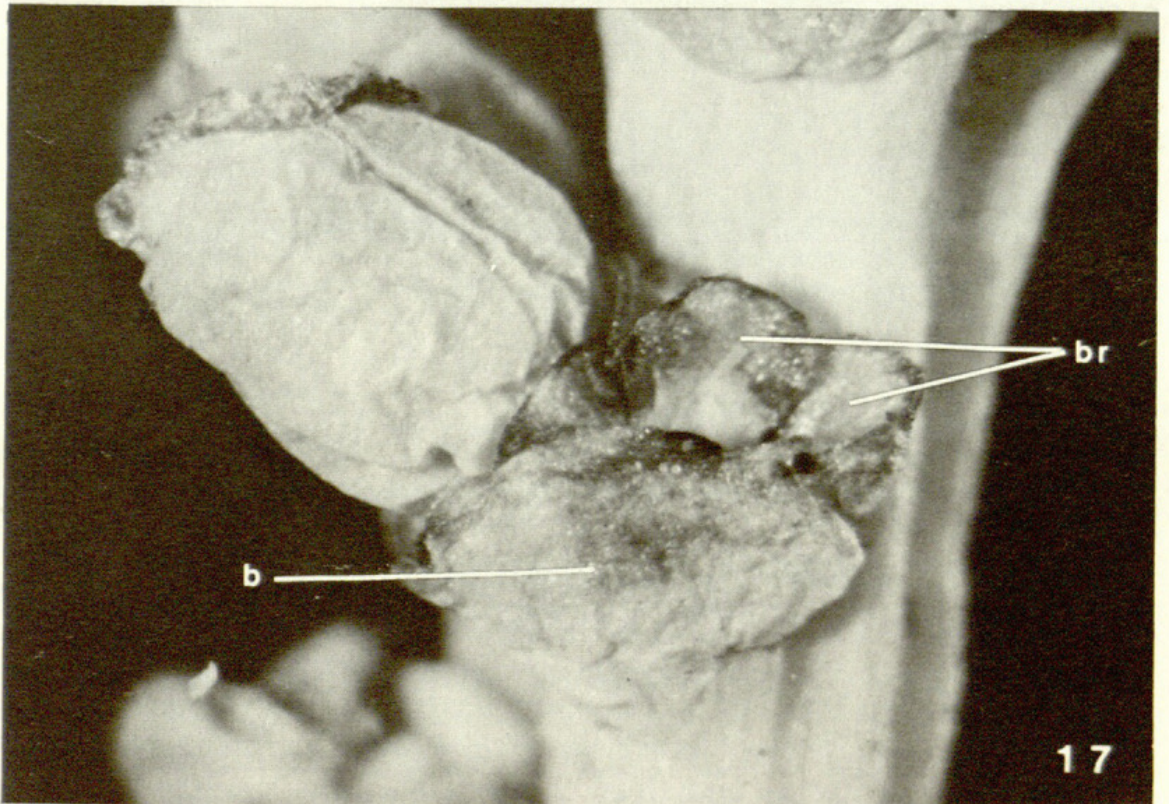
(interdum 3) per centimetrum, costa supra acute sulcata subtus prominenti, nervis secundariis patentibus utrinsecus 10–18 utrinque prominulis, rete venularum irregulariter anastomosanti utrinque prominulo vel plano; inflorescentiis terminalibus et nodos 1–3 distales axillaribus, ubi axillaribus spicatis, ubi terminalibus compositis 4- vel 5-ramosis, ramulis lateralibus spicatis et ad basim liberis, ramulis 2 vel 3 centralibus pedunculo communi enatis, pedunculis primariis et secundariis 5–20 mm. longis, spicis vel ramulis (2–)3–7 cm. longis plerumque 25–50-floris, floribus laxè dispositis, rhachidis partibus nudis plerumque 1–3 mm. longis; bractea sub flore ♂ deltoidea vel reniformi, 0.7–1 mm. longa, 0.8–1.5 mm. lata, copiose glandulosa, apice subacuta vel rotundata, bracteolis lateralibus 2 similibus sed parvioribus $0.3\text{--}0.5 \times 0.5\text{--}0.8$ mm.; stamine solitario, anthera oblonga, 2.5–3 mm. longa, 1–1.2 mm. lata, basi obtusa, apice 0.2–0.3 mm. longo obtuso mucronata; floribus ♀ binis bractea unica subtentis utroque 3-bracteolato, bracteis bracteolisque eis ♂ similibus; pistillo subgloboso vel ovoideo post anthesin et fructu 0.7–1.5 mm. longo et 0.7–1.2 mm. lato, stigmate conspicuo 0.8–1 mm. lato, fructus endocarpio verrucoso apice obtuso.

TYPEIFICATION AND NOMENCLATURE. The taxon here described as a new species was first misidentified by Seemann, on the basis of his no. 564, as *A. lanceolata* Hooker f., but later in *Flora Vitiensis* Seemann's concept also included material from New Caledonia, the Kermadec Islands, and Samoa. Concerning the figures in Seemann's 1868 illustration, only those showing two flowering branches seem to be original. Of these, figure 4 (♀) is probably based on Seemann 564 and so belongs with the present species. Figure 1 (♂) is probably based on the Powell specimen listed by Seemann and is referable to *A. diffusa*. Figures 2, 3, 5, and 6 were copied from sketches made by Solms-Laubach and cannot be confidently identified. In assigning specific rank to Swamy's variety I utilize the same type specimen, but I prefer to replace his epithet with one that will commemorate his valuable work on the Chloranthaceae and many other primitive angiosperm families. The type of the new species is *Smith 908*, a Fijian collection with many duplicates, cited below.

DISTRIBUTION. Infrequent in the New Hebrides and Fiji, known only from montane forests and crest thickets at elevations of 760 to 1,241 m.

New Hebrides. AMBRYM: Mt. Toïo, *Aubert de la Rüe* (A, P). TANNA: Mt. Tokosh Meru, *Kajewski 152* (A, K, NY). **Fiji.** VITI LEVU. NAMOSI: Mt. Voma, *Seemann 564* (GH, K), *Fiji Dept. Agr. 612* (SUVA). TAVEUNI: summit of Mt. Uluinalau, Jan. 3, 1934, *Smith 908* (GH, holotype and also holotype of *A. lanceolata* var. *smithii*; isotypes at BISH, BO, K, NY, P, S, UC, US, Y).

Although Swamy considered this taxon and the preceding only varietally distinct, the differentiating characters appear to me worthy of specific recognition. The uniform occurrence of paired ♀ flowers in the present taxon was noted by Swamy, but this situation may very rarely also occur in *A. diffusa*, as noted under that species. In other respects, *A. swamyana*



FIGURES 16, 17. *Ascarina swamyana* (from *Smith 908*): 16, paired ♀ flowers subtended by a single bract, $\times 30$; 17, same with one pistil removed to show two of the flower-subtending bracteoles, $\times 30$ (b = flower-subtending bract; br = bracteoles).

differs from *A. diffusa* in its often longer petioles, its proportionately broader and fewer-nerved leaf blades which are only short-decurrent on

the petiole and have more coarsely crenate-serrate margins, and its apparently smaller pistils and fruits.

8. *Ascarina lucida* Hooker f. Fl. Novae-Zel. 1: 228. 1853; Cheeseman, Man. New Zeal. Fl. 598. 1906, Ill. New Zeal. Fl. 2: *pl.* 166. 1914; Swamy in Proc. Nat. Inst. Sci. India 19: 379, p. p. excl. spec. Ins. Kermadec. *fig.* 8. 1953; Allan, Fl. New Zeal. 1: 172. 1961.

TIPIFICATION AND NOMENCLATURE. In his original publication of this binomial Hooker cited two collections, "Northern Island, Totara-nui, Banks and Solander," and "Swamps, Wairarapa Valley, Colenso," and he also listed "*Trophis lucida* Banks et Sol. MSS. et Ic." Cheeseman in 1914 indicated that Banks and Solander first obtained the species in January, 1770, in Queen Charlotte Sound (Marlborough Province, South Island). The Colenso locality is in Wellington Province, North Island. Although it would seem that the Banks and Solander material is a logical choice as the lectotype, a botanist familiar with New Zealand plants should make such a decision after examining all the material that may have been seen by Hooker. The three Kermadec Island specimens cited by Swamy should be excluded from the species, at least in my present opinion.

Cheeseman's 1914 illustration shows that sometimes a rudimentary pistil occurs adaxially in ♂ flowers, as noted above for *A. diffusa* (FIGURE 6).

9. *Ascarina lanceolata* Hooker f. in Jour. Linn. Soc. Bot. 1: 127, 129 as *Asimina l.*, sphalm. 1856; Cheeseman, Man. New Zeal. Fl. 597. 1906.

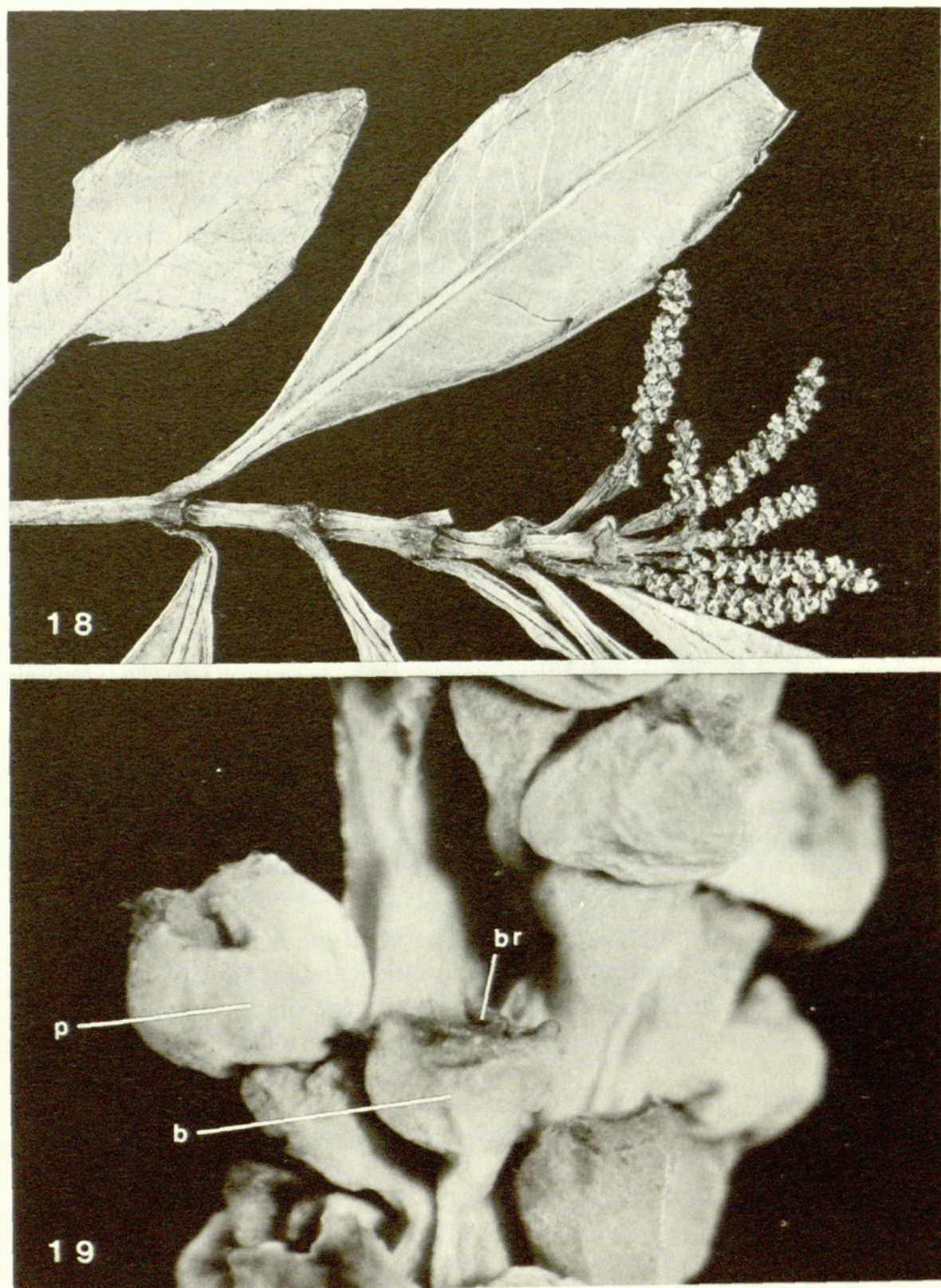
Ascarina lucida sensu Swamy in Proc. Nat. Inst. Sci. India 19: 379, p. p. 1953; non sensu typi.

Ascarina lucida var. *lanceolata* Allan, Fl. New Zeal. 1: 173. 1961.

TIPIFICATION AND NOMENCLATURE. *Ascarina lanceolata* is typified by a MacGillivray (κ) specimen (H. M. S. *Herald* Bot. 982) collected July 24, 1854, on Raoul Island ("Sunday Island"), Kermadec Islands.

DISTRIBUTION. Kermadec Islands.

The MacGillivray specimen was cited by Swamy, without indication of its type status, as representing *A. lucida* Hooker f. In thus considering *A. lucida* as occurring in both New Zealand and the Kermadec Islands Swamy was anticipated by Hooker himself (Handb. New Zeal. Fl. 253. 1864), who in discussing *A. lucida* commented, "I find that the Kermadec Island plant with larger leaves, which I distinguished as *A. lanceolata* (Jour. Linn. Soc. i. 129) is only a variety of the New Zealand one." Certainly many recent students of the New Zealand flora concur in this opinion, although the trinomial seems to have been proposed only by Allan in 1961. In view of the paucity of good differentiating characters in *Ascarina* and our still very incomplete knowledge of the genus, I be-



FIGURES 18, 19. *Ascarina subfalcata* (from Moore 657): 18, tip of branchlet with ♀ inflorescences, $\times 2$; 19, portion of ♀ spike with one pistil removed, showing flower-subtending bract and lateral bracteoles, $\times 30$ (b = flower-subtending bract; br = lateral bracteole; p = pistil).

lieve that *A. lanceolata* is best considered a Kermadec Island endemic at the specific level for the time being. In foliage it is very readily distinguishable from *A. lucida*, as indicated by Cheeseman in 1906. Dr. W.

R. Sykes (in litt.) indicates that the seeds of the Kermadec Island *Ascarina*, like those of *A. lucida*, are white or sometimes have a pale reddish flush, whereas those of the Rarotonga plant (herein referred to *A. diffusa*) are shining black or dark brown.

10. *Ascarina rubricaulis* Solms in DC. Prodr. 16(1): 478. 1869;
Swamy in Proc. Nat. Inst. Sci. India 19: 380. fig. 9. 1953.

TIPIFICATION AND NOMENCLATURE. Solms originally cited three New Caledonian collections: *Pancher*, *Deplanche*, and *Vieillard 1212*. Pancher sheets of the species, without number or locality, are available at A, BM, and K. *Vieillard 1212* is duplicated at A, BM, GH, and K. Like certain other Vieillard collections, this number appears to combine material from two localities, Balade and Wagap. Although Swamy has indicated the Vieillard sheets available to him as "cotypes," I do not believe that he has thus adequately lectotypified the species; this task remains for a student of New Caledonian plants.

The binomial "*A. lurida*" seems to have originated inadvertently through Solms's listing of "*A. lurida* Hook. f., J. Linn. Soc. 1: 129, solum nomen." This name has no nomenclatural status and presumably refers to a herbarium misidentification of a New Caledonian plant as *A. lucida*.

11. *Ascarina subfalcata* J. W. Moore in Bishop Mus. Bull. 102: 26.
1933. FIGURES 18, 19.

TIPIFICATION AND NOMENCLATURE. The holotype is *Moore 657* (BISH), collected on the south end of Opoa Mountain, Raiatea, Society Islands, on March 5, 1927. I believe that this species is very distinct from Swamy's concept of *A. lanceolata*, the binomial to which he reduced it.

DISTRIBUTION. Known only from the type collection and presumably endemic to the island of Raiatea, where it is known at an altitude of 200 m.

Ascarina subfalcata has much shorter inflorescences and more congested flowers than *A. diffusa* (i.e. *A. lanceolata* sensu Swamy, non Hooker f.). It is also quite distinct from its congeners in having its flower-subtending bracts semipoculiform at anthesis rather than attached only by the base, and in its comparatively small, subglobose pistil. Its relationship is probably with *A. lanceolata* (sensu vero) rather than with *A. diffusa*. One may note that the three species now seemingly endemic to the Society and Marquesas Islands are not closely interrelated; *A. marquesensis* is probably derived from a forbear of *A. philippinensis*, *A. polystachya* from an ancestry suggestive of *A. diffusa*, and *A. subfalcata* from a plant resembling *A. lanceolata*.

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DEPARTMENT OF BOTANY
UNIVERSITY OF HAWAII
3190 MAILE WAY
HONOLULU, HAWAII 96822



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