

Flora of Micronesia,
4: Caprifoliaceae–Compositae

*F. Raymond Fosberg
and Marie-Hélène Sacht*



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ABSTRACT

Fosberg, F. Raymond, and Marie-Hélène Sacht. Flora of Micronesia, 4: Caprifoliaceae-Compositae. *Smithsonian Contributions to Botany*, number 46, 71 pages, 1 figure, 1980.—The fourth installment of the Flora of Micronesia includes a brief introduction with acknowledgments and references to previously published parts of the flora. A floristic taxonomic account of the Caprifoliaceae, Campanulaceae, Goodeniaceae, and Compositae of Micronesia is given with descriptions, keys, synonymy, ethnobotany (including vernacular names and uses), and citations of geographic records and herbarium specimens.

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*F. Raymond Fosberg
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Introduction

The fourth installment of the Flora of Micronesia treats four families, all those in the Engler system following the Rubiaceae, except the Cucurbitaceae, which is placed by us earlier in the sequence with its obvious relatives, the Caricaceae and Passifloraceae. Of the families treated here the Caprifoliaceae and the Campanulaceae are each represented by one introduced species of one genus. Of the Goodeniaceae there is one very widespread indigenous strand species. The Compositae (Asteraceae) include, in Micronesia, 37 genera, 5 of them indigenous (3 of these perhaps doubtfully so) and 32 exotic, either spontaneous or cultivated. Of the 55 species, 9 are probably indigenous (several doubtfully so), 45 introduced, and one a spontaneous hybrid between 2 of the exotic species.

This installment follows essentially the format of the first three (*Smithsonian Contributions to Botany* 20, 24, and 36). Further and more complete bibliographic detail may be found in Sacht and Fosberg, *Island Bibliographies* (1955), and its *Supplement* (1971), with annotations and a complete list of serial abbreviations.

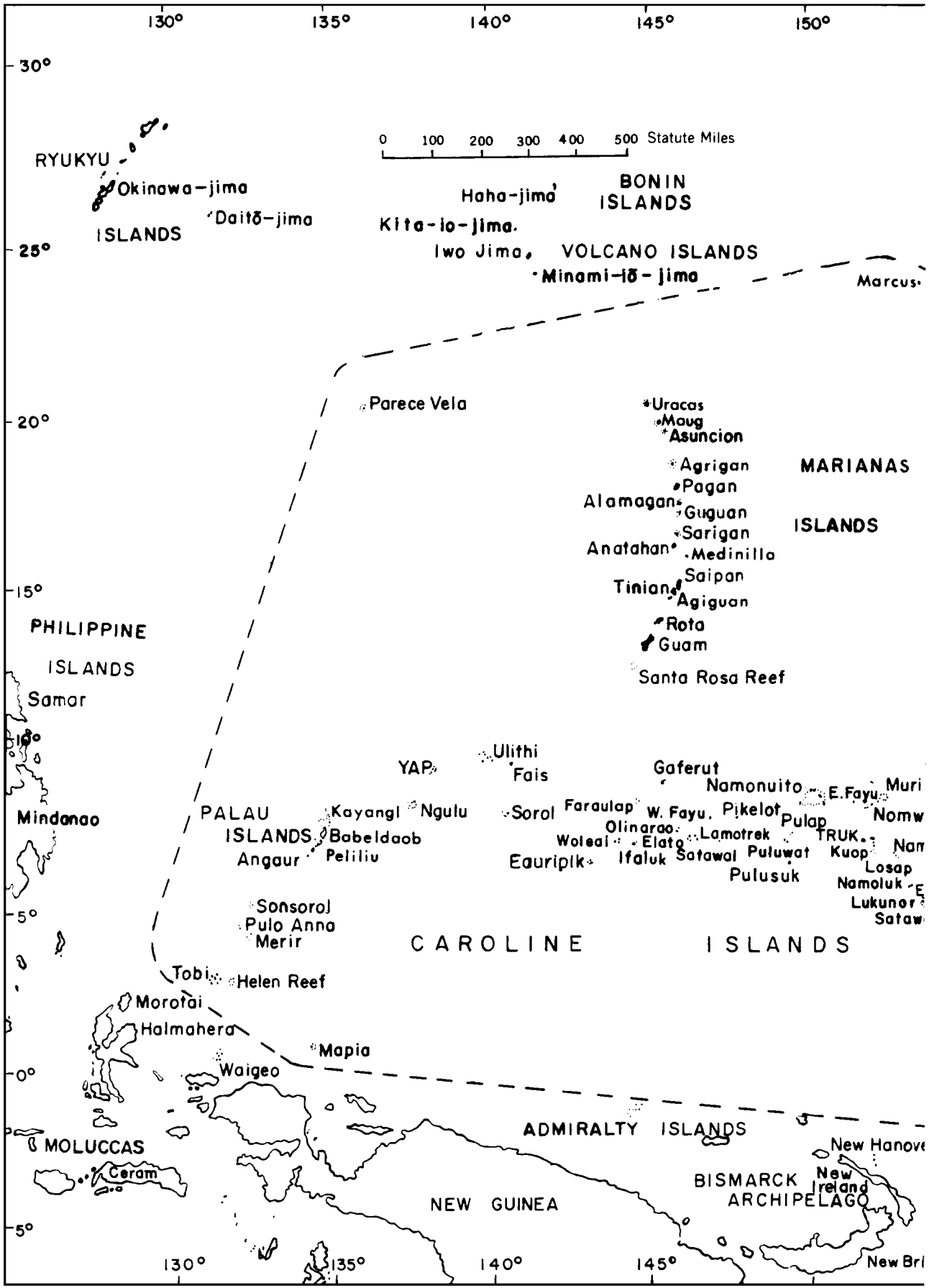
For details of the history and circumstances of the present flora, as well as an explanation of its

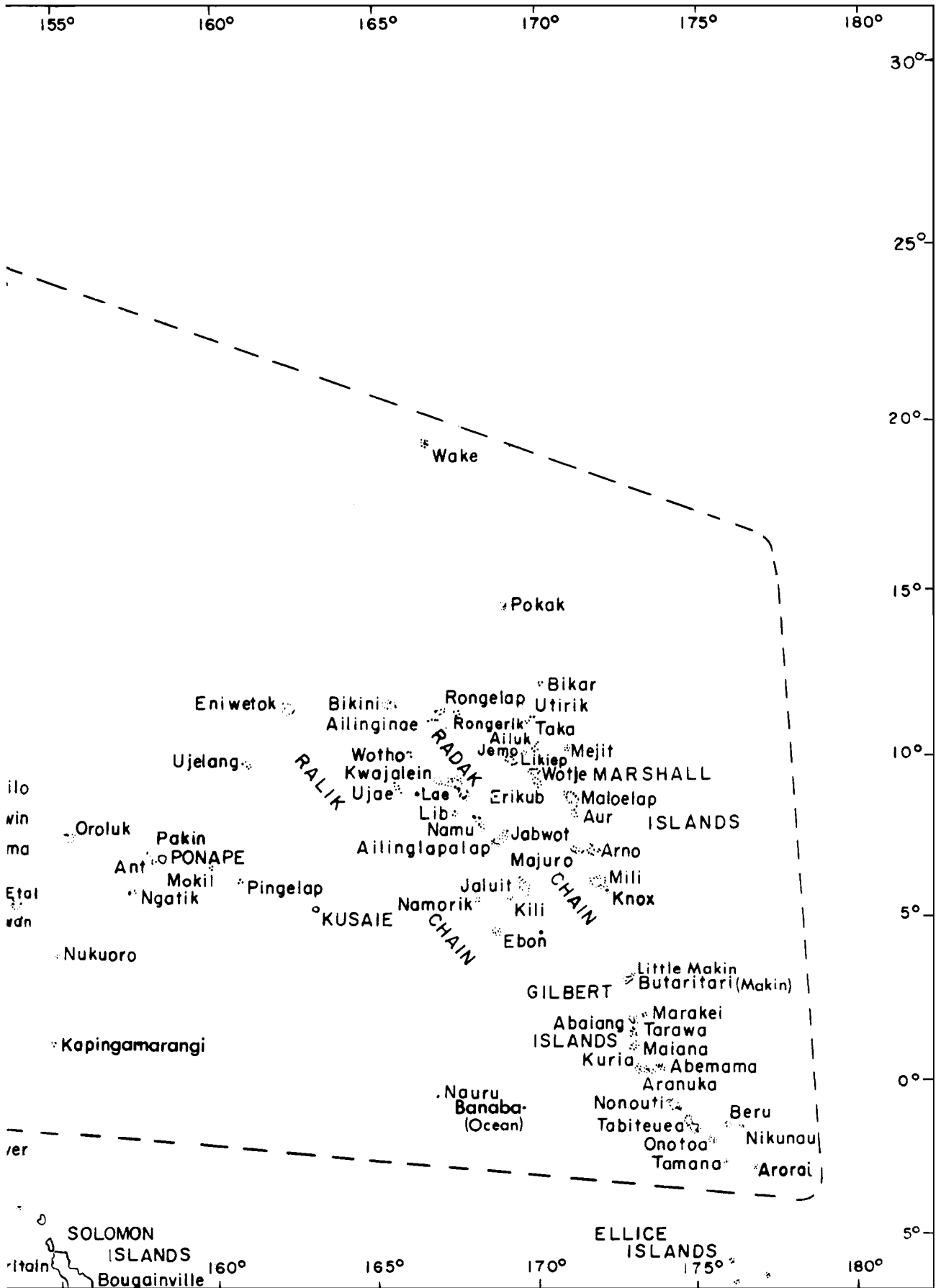
scope and arrangement, reference may be made to the introductory pages of the first installment.

In citations of specimens, the collector's name and number are italicized and the herbaria where they are deposited are indicated only if the specimen has been examined by the authors. Herbarium symbols are according to the 6th edition of *Index Herbariorum*, Part I, compiled by Holmgren and Keuken, 1974. In this edition the symbols "HAW" for the University of Hawaii and "GUAM" for the University of Guam, are introduced, differing from those used for these two herbaria in installments 1 and 2. The symbol Mi is used for the herbarium of the Mid-Pacific Marine Laboratory, at Eniwetok, Marshall Islands. The symbol "Fo" is used for specimens still in the possession of the authors. We wish to thank, again, the authorities of the various herbaria where we have studied or borrowed material, for the privilege of using their collections and for their hospitality.

As mentioned in the first installment we cannot list the many persons who helped us in the field, in herbaria, and in the office. However, we must express our special appreciation to Mr. Royce Oliver for handling, keeping available, and recording data from herbarium specimens, and to Miss Dulcie Powell for compiling, checking, and organizing geographical, ethnobotanical, and bibliographical data and for supervising typing of parts of the earlier drafts of the manuscript.

F. Raymond Fosberg and Marie-Hélène Sacht, Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.





Mrs. Rosemary Lardner very competently put together and retyped the various parts of the manuscript prepared by earlier typists.

In preparing this account we have found Dr. Josephine Koster's account of certain of the Compositae of Malaysia (1935) and that of the Asteraceae of Java by Backer and Bakhuizen van den Brink (1965) very helpful. We have also benefited from the advice of the reviewers, Dr. D. H. Nicolson and Dr. Harold Robinson. As in the earlier parts of the flora, we have been helped greatly by the bibliographic work of Mrs. M. J. van Steenis-Kruseman and Wm. T. Stearn (1954), F. A. Stafleu (1967) and F. A. Stafleu and R. S. Cowan (1976), where exact dates of publication of a great many early works are established or clarified.

Besides our own field work, the greater part of our information on the morphology, occurrence, distribution, and ethnobotany has come from herbarium specimens and their labels. Too seldom is appreciation expressed to the numerous collectors who have provided this vast store of data for use by their successors. We are glad to offer our thanks to them.

In the paragraph headed "Uses" under the various species, we have, where the material was not too verbose, copied more or less verbatim from field labels, field notes, published articles and books, but have used quotation marks only where they seem useful to clarify the source of the information. The sources are always provided, except in cases where the information is from our own personal knowledge.

CAPRIFOLIACEAE

Woody plants or more rarely herbs, habit various, perennial; leaves opposite, simple or compound, usually exstipulate, rarely with modified stipules; inflorescence cymose, flowers usually bisexual (or some enlarged and sterile), actinomorphic to strongly zygomorphic; calyx usually reduced, 5-lobed or 5-toothed, epigynous; corolla gamopetalous, usually 5- (rarely 6-) lobed, rotate, campanulate, salverform, or bilabiate; stamens 5 or 4, rarely 6, inserted on corolla, alternate with

lobes, anthers 2-celled, introrsely (or extrorsely) longitudinally dehiscent; pistil 1, ovary inferior, locules 1-5, ovules 1 in a locule, rarely more, pendulous, style 1, stigma as many lobed as ovary-cells; fruit a berry, drupe or capsule; seeds with endosperm.

A widely distributed family but with rather few genera and not many species. One species planted in Micronesia.

Sambucus L.

Sambucus L., Gen. Pl. ed. 5, 130, 1754 [1753].

Usually shrubs or small trees, rarely herbs; leaves pinnately compound, sometimes bipinnate, stipules peglike, interpetiolar, if present; inflorescence a flat-topped or strongly convex paniculate cyme; corolla white or cream colored, rotate or saucer-shaped, often somewhat zygomorphic; fruit a berry with 2-6 seeds.

A widespread genus in temperate, subtropical, or montane tropical areas. One species widely planted in the tropics including Micronesia.

Sambucus mexicana Presl ex de Candolle

Sambucus mexicana Presl ex de Candolle, Prodr., 4:322, 1830.—Fosberg, Falanruw, & Sacht, Smithsonian Contr. Bot., 22:41, 1975.

Sambucus mexicana var. *bipinnata* (Schlechtendal & Chamisso) Schwerin, Mitt. Deutsche Dendr. Ges., 18:38, 325, 1909.—Fosberg, Occ. Pap. Bishop Mus., 23:43-44, 1962.—Fosberg & Sacht, Atoll Res. Bull. 92:36, 1962.—Stone, Micronesica, 6:567, 1971.

Sambucus javanica sensu Kanehira in herb. [non Reinwardt ex Blume, Bijdr. 13:657, 1826].

Sambucus canadensis sensu Fosberg in herb. [non L., Sp. Pl. 269, 1753].

Small tree or shrub, strongly sprouting from roots, branchlets slender, not fistulose, glabrous; leaflets ovate to ovate-elliptic, acuminate, serrate, with veins somewhat hispidulous beneath, rachis with tufts of hair at bases of petiolules, lower leaflets often divided; panicle flat or somewhat convex, up to 20 cm or more across, usually less, flowers white, ovary 5-celled; berries black, juicy, usually only a few maturing.

Our plants usually have leaves bipinnate at

base, which would make them var. *bipinnata* (Schlechtendal & Chamisso) Schwerin, but it is very doubtful if this variety is of any significance. Closely related to *S. canadensis* L. but differing in the more arborescent habit and nonfistulose branchlets.

Native of Mexico, extensively planted in Tropical America as a medicinal plant, and elsewhere as an ornamental, sparingly introduced into Micronesia—planted on Agrigan, Guam, Yap, Palau, and Majuro—as an ornamental. It has been on Guam for many years.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: village, *Fosberg 31435* (US).

Guam: Mangilao, cult., *Stone 5161* (GUAM); Umatag, cult., *Fosberg 25369* (US, BISH, Fo); Yona, cult.?, *Stone, Long & Fletcher 5065* (GUAM).

CAROLINE ISLANDS.—Palau: Koror, cult., *Kanehira 2080* (KYO).

Yap: Weraloi Dist., King village, cult., *Ross* in 1949 (US).

MARSHALL ISLANDS.—Majuro: Dalap I., *MacKenzie* in 1960 (US).

Jaluit: *Fosberg & Sachet*, 1962: 36 (citing Okabe).

CAMPANULACEAE

Mostly herbs, but with a considerable number of woody species, often lactiferous (subfamily Lobelioideae); leaves simple, alternate, exstipulate; inflorescence cymose, spicate, or with solitary flowers; flowers regular or (usually in subfamily Lobelioideae) zygomorphic; flower parts epigynous; calyx lobes separate, 3–10, usually 5; corolla united, 5–6 lobed; stamens 5, free or (in subfamily Lobelioideae) united, subbasally or basally attached; ovary 1–5-celled, rarely 10-celled, with many ovules on axillary placentae, fruit a capsule or berry; seeds small.

Hippobroma G. Don

Hippobroma G. Don, Gen. Hist. Dichl. Pl. 3:717, 1834.—McVaugh, Bull. Torr. Cl. 67:781–784, 1940.

Lobelia L., Gen. Pl. ed. 5, 401, 1754 [1753] [pro parte].

Laurentia Adanson, Fam. Pl. 2:134, 1763 [pro parte].

Isotoma R. Brown, ex Lindley, Bot. Reg. 12:t. 964, 1826 [pro parte].—Presl, Lobel. 42, 1863.

Herbs with abundant latex; pedicels with 2 filiform bracteoles; corolla salverform with a long slender tube not at all split dorsally, lobes subequal; ovary inferior, hypanthium with a free rim; seeds conspicuously foveolate-reticulate.

A genus of a single species of West Indian origin, now pantropical, of rather recent introduction in Micronesia.

Hippobroma longiflora (L.) G. Don

Hippobroma longiflora (L.) G. Don, Gen. Hist. Dichl. Pl. 3: 717, 1834.—Otobed, Guide List Plants Palau Is., 31, 1977.

Lobelia longiflora L., Sp. Pl. 930, 1753.

Rapuntium longiflorum Miller, Gard. Dict. 1768.

Isotoma longiflora (L.) Presl, Lobel. 42, 1836.—Rechirei et al., Some Flowers of Palau, 8, 1962.

Laurentia longiflora (L.) Petermann, Pflanzenr. 444, t. 118, f. 665, 1845.—Moeliono & Tuyn, F. Males. I, 6:140–141, 1960.—Stone, Micronesica 6:568, 1971.

Herb to 50 cm tall, simple or loosely branched, pubescent; leaves elliptic to lanceolate or oblanceolate to narrowly obovate-cuneate, to 15 × 4–5 cm, apex bluntly acute to acuminate, base sessile, acute, or narrowed to a short petiole, margin irregularly dentate, or shallowly runcinate, teeth widely spaced, low to prominent; flowers on short pedicels in upper axils; calyx lobes broadly linear, 8–14 mm long, from the free margin of the pilose hypanthium; corolla white, elongate, tube straight, 8–14 cm long, lobes spreading, lanceolate or narrowly ovate, to 2 × 0.5 cm; anther tube just exerted, with a short brush of hairs around the top; stigma capitate, just exerted from the anther tube; fruit a thin-walled capsule, cylindrical to broadly ellipsoid, to 1.5 × 1 cm, loculicidal across the top; seed light dull brown, broadly ovoid to subglobose.

A pantropical weedy species, sometimes planted as an ornamental, probably native to the West Indies. In Micronesia apparently of relatively recent introduction; collected from cultivation in Saipan by Kanehira in 1930, widely spread during and after World War II. Consid-

ered to be very poisonous, at least if eaten.

VERNACULAR NAMES.—

star of Bethlehem (Guam: Stone, 1971)
 btuch, star of Bethlehem (Palau: Rechirei et al., 1962)
 star of Bethlehem (Palau: Koror: Hardy 46)
 udel ra badrei (Palau: Otobed 1977)
 star of Bethlehem, Bung (Sonsorol: Berry 55)
 adilep (Yap: Fosberg 46314)
 ehmah (Mokil: Glassman 1953)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: cult., *Kanehira* 1075 (FU); ridge N of Tapotchau Mt. peak, 350 m, *Fosberg* 31766 (US, BISH, Fo, NY, L); Navy Hill, 250 m, *Evans* 2308 (US, BISH, Fo, NY); Army Hill, *Courage* 10 (US); Charan-Kanoa, 50 ft [15 m], *Hosaka* 2982 (US, BISH).

Rota: s.l., *Necker* R20 (US); trail to Sabana, 100–250 m, *Evans* 2122 (US, BISH, Fo, NY); Sabana, 1500 ft [460 m], *Kondo* s.n. in 1952 (BISH); 490 m, *Fosberg* 31851 (US, BISH, Fo, NY); Sonson, 1–10 m, *Fosberg* 24970 (US, BISH); Songsong Village to above Aratsu Bay, 200–300 m, *Evans* 1915 (US).

Guam: *Whiting* 14 (Fo); above Jona, 100–150 m, *Evans* 684 (US, BISH, Fo, NY, L, P, TI, A); Barrigada, *Stone* 4267 (BISH, GUAM).

CAROLINE ISLANDS.—Palau: s.l., *Kanehira* & *Hatusima* 4408 (FU); *Richardson* 115 (US); Meringel, *Salsedo* 273 (US, BISH, Fo, NY); Babeldaob: Ngiual, 50 ft [15 m], *Hosaka* 3405 (US, BISH); *Cheatham* 92 (US); *Hatusima* 4853 (FU); Ngara-baket, *Tuyama* in 1939 (TI); Koror: Ngerebe'ed, 5–10 m, *Fosberg* 32246 (US, BISH, Fo, NY, L); Ngerebeched, *Adelbai* & *Ngirakesan* (*Owen's*) 16 (BISH); 200 ft [60 m], *Hill* 16 (BISH Fo); Kangsok, 46 m, *Hardy* 46 (US, BISH).

Sonsorol Island: *Berry* 55 (US, BISH).

Yap: Keng village, N of Colonia, 10 m, *Fosberg* 46314 (US); E coast to Mt. Matude, 20 m, *Cushing* 438 (US)

Fais: Lochochoy, 15 m, *Fosberg* 46656 (US); 5 m, *Evans* 349 (US, BISH).

Truk: Moen I.: Nepukos village, 3 m, *Daniells* 110 (US).

Ponape: Colonia, *Glassman* 2910 (US, BISH);

Takamatsu 807 (BISH); near Catholic mission, *Anderson* 830 (US, BISH, Fo, NY, L); *Stone* 1975 (GUAM).

Mokil: Glassman, 1953:296 (cult.).

MARSHALL ISLANDS.—Likiep: 1–2 m, *Fosberg* 27042 (US, BISH).

Arno: Arno I., interior, *Stone* 1100 (Fo); *Anderson* 3765 (US, BISH, Fo).

Jaluit: Jabor, seen by Fosberg in 1958.

GOODENIACEAE

Herbs, shrubs, or small trees; leaves alternate or rarely opposite or basal, simple, exstipulate; inflorescence cymose, or racemose, or flowers solitary, axillary; flowers bisexual, usually 5-parted, parts epigynous; calyx lobed or cuplike; corolla zygomorphic, tube often split dorsally, limb 5-lobed or bilabiate, lobes valvate or margins induplicate; stamens 5, alternate with corolla lobes, filaments free, epigynous or attached to base of corolla, anthers free or coherent to form a cylinder around style; pistil 1, ovary usually inferior, 1- or 2-celled, placentation basal or axile, ovules 1, 2, or many, ascending, style 1, stigma simple or lobed, subtended by a cuplike indusium; fruit a capsule, berry, drupe, or nut.

A small Australian family with a few Pacific Island species.

***Scaevola* L.**

Scaevola L., Mant., 2:145, 1771 [nom. cons.].

Lobelia sensu Miller, Gard. Dict., ed 5, LO, 1754.—Adanson, Fam. Pl., 2:157, 1763.—Wight in Safford, Contr. U.S. Nat. Herb. 9:310, 1905 [non L., Gen. Pl. ed. 5, 401, 1754 [1753].]

Shrubs or rarely small trees; leaves usually alternate, rarely opposite, usually with white hairs in axils; flowers in axillary cymes or solitary, rarely apparently in racemes; calyx truncate, cup-shaped, more rarely 5-lobed; corolla with tube split down dorsal side, usually to base, lobes with membranous margins, these induplicate in bud, lobes spread in a fanlike arrangement; stamens 5, filaments slender, anthers free; style usually

curved at top, ovary 2-celled, ovules 1 in a cell; fruit a drupe with a bony stone, this in some species surrounded by softer aerogenous or corky tissue, 2-celled and with 2 small empty cavities; seeds one or two.

Principally Australian, with some insular species and two widespread strand species. One of these is ubiquitous along beaches and on rocky shores and cliffs in Micronesia.

Scaevola taccada (Gaertner) Roxburgh

Scaevola taccada (Gaertner) Roxburgh, Hort. Beng., 15, 1814.—Krämer, in Thilenius, Erg. Süds. Exp., IIB 10, 1: 181, 298, 390, 1937 [as *Scaevola*].—St. John, Taxon, 9:200, 1960.—Fosberg, Taxon 10:225, 1961; 11:181, 1962.—Fosberg & Sachet, Atoll Res. Bull., 92:36, 1962.—Stone, Micronesica, 1:126, 1964.—Otobed, ms., 1967.—Kiste, Kili I., 74, 1968.—Fosberg & Sachet, Atoll Res. Bull., 123: 15, 1969.—Otobed, Guide List Plants Palau Is., 1971; 1977.—Stone, Micronesica, 6:569, 1971.—Alkire, Micronesica, 10:2, 1974.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:41, 1975.—Falanruw & Payne, Life on Guam, 21, 44, 1976.—Moore et al., Inv. Mapping Wetl. Veg. Mariana Is., 22, 27, 34, 1977.

Lobelia taccada Gaertner, Fruct. Sem. Pl., 1:119, t. 25 f. 5, 1788.

Scaevola sericea Forster f., Prodr., 89, 1786 [nom. nudum].

Scaevola sericea Vahl, Symb. Bot., 2:37, 1791.—Okabe, Bull. Trop. Indust. Inst. Palau, 5:14, 1940.—Fosberg & Sachet, Taxon, 5:7, 1956.—Catala, Atoll Res. Bull., 59:107, 1957.—Grimble, Return to Islands, 27, 1957.—Niering, Atoll Res. Bull., 76:3, 1961.

Scaevola koenigii Vahl, Symb. Bot., 3:36, 1794 [as *Koenigii*].—Chamisso, Rem. Op., 145, 1821.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:170, 1834.—de Candolle, Prodr., 7(2):505, 1839 [as *Kaenigii*].—Mueller, Desc. Not. Pap. Pl., 4:59, 1876.—Schumann, Bot. Jahrb., 9:222, 1888.—Engler, Notizbl. 1:226, 1897.—Christian, Caroline Is., 331–332, 344, 1899.—Schumann & Lauterbach, Fl. Süds., 594, 1901.—Volkens, Bot. Jahrb., 31:477, 1901; Notizbl. 4:91, 1903.—Safford, Contr. U.S. Nat. Herb., 9: 371, 1905.—Hambruch, Erg. Südsee Exp. 2B, 7(1):351, 1932.—Burgess ms., ca. 1935.—Riesenberg, S. W. Jour. Anthropol. 4:427, 1948.—Luomala, Bishop Mus. Bull., 213: 93, 1953.

Scaevola velutina Presl, Rel. Haenk., 2:58, 1831 [1835].—de Candolle, Prodr., 7:506, 1839.—Safford, Contr. U.S. Nat. Herb. 9:371, 1905.

Scaevola lobelia Buchanan-Hamilton, Trans. Linn. Soc., 17: 249, 1837.—Luomala, Bishop Mus. Bull., 213:35, 92, 1953 [non Murray, Syst. ed. 13, 178, 1774].

Scaevola leschenaultii de Candolle, Prodr., 7(2):506, 1839.

Lobelia koenigii (Vahl) Wight in Safford, Contr. U.S. Nat. Herb., 9:310, 1905.—von Prowazek, Deutsch. Marianen, 83, 121, 1913.—Stone, Micronesica, 1:126, 1964.

Scaevola frutescens (Miller) Krause in Engler, Pflanzenr. 54(IV, 277):125, f. 25, 1912.—Merrill, Phil. Jour. Sci. Bot., 9:152, 1914.—Koidzumi, Bot. Mag. Tokyo, 29:255, 1915.—Diels, Bot. Jahrb., 56:561, 1921.—Kanehira, Fl. Micr., 38, 389, 469, 1933; Enum. Micr. Pl., 428, 1935.—Hosokawa, Bull. Biogeogr. Soc. Jap., 7:202, 1937.—Tuyama, Jour. Jap. Bot., 14(6):425, 1938.—St. John, Pac. Sci., 2:104, 112, 1948.—Taylor, Pl. Bikini, 201, 1950.—St. John, Pac. Sci., 5:286, 1951.—Guillaumin, Bull. Soc. Bot. Fr., 99:22, 1952.—Glassman, Bishop Mus. Bull., 209:98, 1952; Pac. Sci. 7:296, 304, 1953.—Luomala, Bishop Mus. Bull., 213: 9, 27, 47, 93, 1953.—St. John and Mason, Pac. Sci., 7:167, 1953.—Stone, Pac. Sci., 13:104, 1959.—Kiste, Kili Is., 38, 51, 74, 1968.

Scaevola frutescens var. *sericea* (Forster f.) Merrill, Phil. Jour. Sci. Bot., 7:354, 1912.—Kanehira, Enum. Micr. Pl., 428, 1935.—Luomala, Bishop Mus. Bull., 213:93, 1953.

Rounded, moundlike shrubs or small trees when well developed, branching “terminalioid”; leaves usually in conspicuous rosettes at ends of twigs, obovate, scarcely petiolate, base cuneate-decurrent, apex rounded, margin entire or obscurely serrate distally, venation except midrib obscure, usually a tuft of long white hairs in axil; cymes axillary, slender, dichasial, 2–4 (or more) times ramified, usually pubescent, bracteate, bracts small; flowers white (or purple), calyx lobes narrowly oblong 1–4(–5) mm long, blunt; corolla tube 1–1.5 cm long, lobes obovate, 5–8 mm long, style subequal with or exceeding tube, hooked, indusium hirsute, stigma somewhat flattened, slightly bilobed or emarginate; drupe oval or subglobose, white, or purplish on one side, flesh soft, tasteless, stone ellipsoid, ribbed, outer layer aerogenous or corky.

This species is extremely variable. It exhibits great diversity in leaf size and shape (2–30 ± cm) (spatulate to obovate to orbicular), hairiness (glabrous to sericeous blades, slight to conspicuous white hair in axils); white to purple flowers, as well as great variations in habit and stature. These do not seem to be in any way correlated, however. The extremely hairy forms have been called *Scaevola sericea*; even in Micronesia there seems to be no break in the series of intergrades from this to a glabrous plant.

A very widespread Indo-Pacific species, distributed on almost all islands and continental coasts from East Africa to eastern Polynesia, north to Okinawa, northern Marianas, and Hawaii. Peripheral populations, as in eastern Polynesia and Hawaii, have been distinguished as varieties.

Ordinarily a strand plant, occurring to tops of cliffs in the range of salt spray, more rarely extending to interior open situations, especially disturbed places; on Nauru the dominant species on the plateau areas of limestone strip-mined for phosphate.

In Micronesia known from the Marianas (Asuncion, Agrigan, Pagan, Alamagan, Guguan, Sarigan, Anatahan, Saipan, Tinian, Rota, Guam), Carolines (Palau, Sonsorol, Merir, Tobi, Helen Reef, Yap, Ulithi, Fais, Eauripik, Woleai, Faraulap, Ifaluk, Lamotrek, Satawal, Puluwat, Namonuito, Murilo, Nomwin, Truk, Nama, Losap, Namoluk, Etal, Lukunor, Satawan, Nukunoro, Kapingamarangi, Ant, Ponape, Mokil, Pingelap, Kusaie), Marcus I., Wake I., Marshalls (Pokak, Bikar, Eniwetok, Bikini, Ailinginae, Rongelap, Rongerik, Taka, Utirik, Ujelang, Ujae, Wotho, Lae, Kwajalein, Ailuk, Jemo, Likiep, Wotje, Aur, Ailinglapalap, Majuro, Arno, Kili, Jaluit), Nauru, Banaba, Gilberts (Butaritari, Marakei, Abaiang, Tarawa, Nonouti, Tabiteuea, Onotoa).

USES.—“The juice of fruits is squeezed into eye to relieve soreness” (Rota: *Evans 2016*). “The juice [of the fruit] can be used as an eyewash” (Guam: Falanruw & Payne, 1976). The young leaves are “used to treat T.B. Fruit is used to control irregular menstruation” (Palau: *Salsedo 92*). “The leaves are pounded, mixed with saltwater, then drunk, this will usually cause...the sick or injured person to vomit” (Sonsorol: *Berry 58*). It is mixed with *Morinda citrifolia* for medicine (Sonsorol: *Berry 112*). “Used in the making of medicine for watery stool...blood, and stomach ache” (Yap: *Wong 353*). Juice of fruit on coconut meat eaten for sea medicine. Flowers used for conjunctivitis (Truk: *Wong 162*). “A decoction of the leaves forms a fine tonic, and the natives say an aphrodisiac” (Ponape: Christian, 1899). “The

wood...is used for the curving booms of the outrigger; also for the roof frame of a house. The leaf is used to make a bitter drink which is given to a pregnant woman just before and just after childbirth (“to clean up the belly inside”); it is also used to wash the mother’s body” (Bikini/Kili: St. John and Mason, 1953). “Roof frames for houses and outrigger booms were constructed with *Scaevola*. The leaves...were valued for medicinal qualities and were part of the native medical practitioner’s standard stock of remedies” (Bikini/Kili: Kiste, 1968). “Young tips crushed with water and used to treat mother after childbirth” (Ailinglapalap: *Fosberg 26799*). “The fruits were crushed and the juice used as eyedrops for inflamed eyes. The pith from the large almost hollow stems was moulded into pellets and used in a type of pop gun and also appeared to be used for making toys etc. for the children” (Nauru: Burges ms. ca. 1935). “Flowers used in garlands. Fruit used in magic and in medicines. Branches sometimes used for roofing strips” (Tarawa: *Catala 5*). Used for personal ornamentation (Onotoa & Tarawa: Luomala, 1953). “Tabiteueans steep women’s skirts in an infusion of...[*Scaevola*]” (Luomala, 1953). “To convey liquid food to infants and elders...a two-foot tube is employed...made of a branch of the mao-bush (*Scaevola*) from which the pith has been extracted.” “Mao leaves are used in a magical fire before a man goes to fish eels and sharks; leaves and drupes are used for bush medicine; children chew the pith as gum; flowers are worn as wreaths; good sticks make posts to support house thatch” (Gilberts: Luomala, 1953).

VERNACULAR NAMES.—

half flower (Guam: Falanruw & Payne, 1976); Lobelia; Salt Bush (Nauru: *Burges K35*)
 nanaso (Marianas: Christian, 1899)
 nanaso (Saipan: von Prowazek, 1913)
 nanaso (Tinian: von Prowazek, 1913)
 nanusu (Rota: *Evans 2016*)
 lanasa (Guam: *Evans 1616*)
 lanisa (Guam: *Evans 722*)
 nanaso (Guam: *Fosberg 25339; Marche 246; Safford, 1905; Merrill, 1914; Stone, 1971; Moore et al., 1977*)
 nanasu (Guam: *Whiting G4; Nelson 60; Falanruw & Payne, 1976*).

- gorai (Palau: *Fosberg 25787*)
gorrei (Palau: Diels, 1921 citing Raymundus 77)
kirrai (Palau: Otobed, 1967, 1977)
korai (Palau: Diels, 1921 citing Ledermann 14060)
korrai (Palau: *Hardy 17*; Otobed, 1967, 1977)
railechol (Palau: Otobed, 1977)
glamahi (Sonsorol: *Berry 112*)
naatu (Sonsorol: *Berry 58*)
hamahi (Tobi: *Black 16*)
nath (Yap: *Fosberg 25527*; Volkens, 1901)
naz (Yap: *Fosberg 25527*)
theth (Yap: *Wong 353*)
thoth (Yap: *Cushing 348*)
thuth (Yap: *Wong 353*)
lad (Ulithi: *Fosberg 46444*)
luth (Ulithi: *Lessa 15*; *Fosberg 25457*)
lath (Fais: *Evans 362*; Krämer, 1937)
rema (Eauripik: *Fosberg & Evans 47092*)
nat (Woleai: Krämer, 1937)
nut (Woleai: Alkire, 1974; *Alkire 2*)
ramacho (Woleai: *Evans 489*)
ramakaa (Woleai: St. John, 1948)
nat (Faraulap: *Fosberg & Evans 47314*)
remag (Ifaluk: *Abbott & Bates 5, 140*)
uema (Ifaluk: *Fosberg 47207*)
himar (Lamotrek: *Fosberg & Evans 46769*)
lot (Lamotrek: Krämer, 1937)
lat (Satawal: *Fosberg 46841*)
not (Namonuito: Stone, 1959)
nüt (Namonuito: Stone, 1959)
nat (Nomwin: *Fosberg 24585*)
nath (Nomwin: *Evans 1071*)
nut (Nomwin: *Evans 1089*)
amáloset (Truk: St. John, 1948)
fremes (Truk: Hosokawa, 1937; Glassman, 1953)
nat (Truk: St. John, 1948)
not (Truk: *Fosberg 24617*; Glassman, 1953; St. John, 1948)
remes (Truk: *Wong 162*)
nut (Satawan: *Anderson 940*)
manugabaasanga (Nukuoro: *Carroll 2, 35, 61*)
manu kapasang (Nukuoro: *Fosberg 26179*)
manuka-pasanga (Nukuoro: Christian, 1899)
nau (Kapingamarangi: *Niering 504, 615, 616, 662, 685, 728*)
ti nau (Kapingamarangi: *Fosberg 26063*)
eenut (Ant: Glassman, 1953)
eenut (Ponape: Glassman, 1953; *Glassman 2401*)
enat (Ponape: St. John, 1948)
inot (Ponape: Christian, 1899; Hambruch, 1932)
inuk (Ponape: *Fosberg 26391*; St. John 1948)
ramuk (Ponape: *Fosberg 26391*; St. John, 1948)
ramak (Mokil: Christian, 1899)
romok (Mokil: *Glassman 2595*; Glassman, 1953)
ramek (Pingelap: *St. John 21462*; St. John, 1948; Glassman, 1953)
kushosh (Kusaie: Glassman, 1953)
kusros (Kusaie: Kanehira, 1935; St. John, 1948)
gunnat (Marshalls: St. John, 1948)
Ka-na-ta (Marshalls: St. John, 1948)
kanot (Marshalls: von Prowazek, 1913)
kanun (Marshalls: St. John, 1948)
kenat (Marshalls: St. John, 1948)
konnat (Marshalls: St. John, 1948)
kunnat (Marshalls: St. John, 1948)
mar kinat (Marshalls: St. John, 1948)
mar kinat (Eniwetok: *Fosberg 24361*)
konnat (Bikini: Kiste, 1968; St. John & Mason 1953)
kannat (Utirik: *Fosberg 33715*)
mar (Ujelang: *Fosberg 34194*)
kannat (Lae: *Fosberg 34090*)
kannat (Ailuk: *Fosberg 33933*)
konnat (Likiep: *Fosberg 26999*)
gunnat (Aur: *St. John 21391*; St. John, 1951)
kunat (Ailinglapalap: *Fosberg 26799*)
kunnat (Majuro: St. John, 1951)
kūnat (Majuro: *Fosberg 26988*)
kölaeme (Arno: *Anderson 3609*)
kenat (Jaluit: Engler, 1897; Schumann & Lauterbach, 1901; Volkens, 1903; *Fosberg & Sachet, 1962*)
kinnat (Jaluit: Diels, 1921)
kunat (Jaluit: *Fosberg 26702*)
kunnat (Jaluit: *Fosberg & Sachet, 1962*)
emit (Nauru: *Burges K35*)
émmed (Nauru: von Prowazek, 1913)
te mau (Gilberts: von Prowazek, 1913)
mao (Tarawa: Catala, 1957)
mao (Tabiteuea: *Luomala 1*; Luomala, 1953)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—s.1., Endlicher 1835:170 (citing Lesson); Christian 1899:332.

Asuncion: SW slope 75 ft [25 m], *Falanruw 2284* (US, BISH, Fo).

Agrigan: Cult., *Fosberg 31428* (US).

Pagan: 1.5 mi [2.4 km] S of W side pier, *Anderson 587* (US, BISH, Fo, NY, L); Talague beach, *Moore 341* (US); Inae Dikiki, below 100 ft [30 m], *Falanruw 1865* (US, BISH).

Alamagan: *Kanehira 2195* (FU); Partido, *Fosberg 31686* (US, BISH).

Guguan: 320 ft [100 m], *Falanruw 1838* (US, BISH).

Sarigan: Above village, 375 m, *Evans 2373* (US, BISH, Fo, NY, P).

Anatahan: *Hosokawa 7844* (A).

Saipan: *Kanehira & Hatusima 4275* (FU), 4290 (A, FU); *Lange 34* (BISH); *Stephens 55* (Fo); 200

m, *Marche 21* (P, Fo); cliffs on Tsukimi Bay, 75 m, *Fosberg 25200* (US, BISH); Kagman Peninsula, *Courage 21* (US); W of Kagman Point, 30 m, *Fosberg 31300, 31304* (both US, BISH, Fo, NY, L); E end of Sabanan Laulau, 1 m [1.6 km] S of As Teo, 200 m, *Fosberg 31312* (US, BISH, Fo); Ditzenyama ridge, 200 m, *Fosberg 31750* (US, BISH, Fo, NY); Laulau Katan Pt., *Fosberg 31923* (US, BISH, Fo).

Tinian: *Okatani 38* (FU); *Hosokawa 7775* (US); Cowan in 1945 (K, A, BISH); near middle plateau, *Kondo 27* (BISH); Long Beach, *Smith 1291* (US); Tinian town, 3 m, *Fosberg 24774* (US, BISH, Fo, NY, L); "Palm Beach," 1 mi [1.6 km] S of Faibus Point, *Fosberg 24859* (US, BISH, Fo, NY, L); "Yellow Beach," E of Mt. Lasso, 1–10 m, *Fosberg 24916* (US, BISH, Fo, NY, L).

Rota: *Necker R 32* (US); Beach Rd., *Kondo* in 1952 (BISH); SW side of island, 0–5 m, *Evans 1908* (US, BISH, Fo, NY); Sonson village, 1–10 m, *Evans 2016* (US); *Fosberg 24957* (US, BISH, Fo, NY, L); northernmost point of island, 5 m, *Sachet 1727* (US); above As Malote, 250 m, *Fosberg 25096* (US, BISH, Fo, NY).

Guam: s.l., Presl 1835:58 (citing Haenke); Endlicher 1835:170 (citing Lesson); de Candolle 1839:506; Merrill 1914:152; *Haenke s.n.* (BM, MO); *Haenke* in 1792? (BISH); *Voy. Astrolabe 38* (P); *Hombroin* in 1841 (P, Fo); *Marche 88* (P, Fo), 246 (P, Fo); *G.E.S. 84* (US); *Guerrero 703* (BISH); *Nelson 60* (BISH); Agaña, *Seale* in 1900 (BISH); Mt. Tenjo, *Rodin 538* (US); 320 m, *Bryan 1107* (BISH); Togcha Bay, *Moran 4366* (US, BISH, MO, Fo); 1–2 m, *Fosberg 25339* (US, BISH, Fo, NY, L); Mt. Alutom, 800 ft [245 m], *Hosaka 3053* (US, BISH, Fo, NY, L); 350 m, E. of Sumay, *Fosberg 25277* (US, BISH, Fo, NY); Sigua Valley, 100–300 ft [30–90 m], *Steere 57* (US); Umatac, 300–400 m, *Anderson 306* (US, BISH, Fo); Manilao, *Whiting G 4* (US, BISH, Fo); Marine Beach, *Pedrus 2* (US); Oca Point, *Glassman 95* (Fo); Ypao Point, *Necker 40* (US); beach S of Ylig R., *Rodin 822 B* (US); shore E of Barrigada village, 10 ft [3 m], *Steere 122* (US); between Inarajan and Merizo, *Necker 204* (US); Tarague Beach, Andersen Air Base, 0–25 m, *Evans 722* (US, BISH, Fo, NY); Lujuna, 0–10 m, *Evans 1616* (US); Adelup Point,

0 m, *Sachet 1717* (US, BISH, Fo), 1718 (US, BISH, Fo), 1719 (US, BISH, Fo), 1720 (US), 1721 (US), 1722 (US, BISH, Fo, NY, L); Campanaya Point, 0–5 m, *Evans 259* (US, BISH, Fo, NY, L, P, TI); Manengon savanna, *Stone 4224* (GUAM); W of Tarzan Falls, *Stone 4208* (GUAM); Atantano R., *Moore 863* (US).

CAROLINE ISLANDS.—*Christian* in 1899 (K).

Palau: s.l., *Ledermann 14060* (K); *Richardson 20* (US); *Kanehira & Nisida 2778* (FU); *Koidzumi* in 1915 (TI). Kayangl: Ngariungs I., *Gressitt 2* (US). Koror: Beginning of causeway to Babeldaob dock, *Salsedo 92* (US); Renrak, *Emmons 26* (US); Ngerbechedesau, *Hardy 17* (US); island in Iwayama Bay, *Tuyama* in 1939 (TI); small island near Korrer, *Herre 34* (NY); "Coral Isld.," *Kanehira 94* (FU), 354 (NY, FU), 2410 (NY, FU). Urukthapel: W side of peninsula, 1–2 m, *Fosberg 32155* (US, BISH, Fo, NY, L); Todaiyama, *Tuyama* in 1939 (TI); *Kanehira 1888* (FU). Ngeanges: In Yoo Passage, 1 m, *Fosberg 25787* (US, BISH, Fo, NY, L). Peliliu: Top of "Bloody Nose Ridge," *Cheatham 164* (US). Necco's I., *Cheatham 66* (US, BISH, Fo). Angaur: *Kanehira 598* (FU).

Sonsorol: Beach, *Berry 58* (US), 112 (US); along beach from village to S tip of island, *Hardy 144* (US, BISH).

Merir: *Salsedo 373* (US).

Tobi (Tokobe): *Kanehira & Okamoto 9* (FU); NW end of island, *Black 16* (US).

Helen Reef: *Salsedo 392* (US).

Yap: Volkens 1901:477 (citing Volkens 133); Merrill 1912:354 (citing Volkens 133); *Kanehira 1135* (FU); top of hill N of Nimar, NNW of Colonia, 170 m, *Fosberg 46540* (US, BISH, Fo); Kanif, *Takamatsu 1957* (BISH); Yaboc, 100 ft [30 m], *Wong 353* (US, BISH, A); Dinay, 30 m, *Cushing 348* (US); Mt. Matade, 160 m, *Fosberg 25527* (US, BISH, Fo, NY, L); Kolonia, Mt. Kabul, *Tuyama* in 1939 (TI).

Ulithi: Pontangeras I., along beach, 5 ft [1.5 m], *Hosaka 3241* (US, BISH); Fassera I., 2–4 m, *Fosberg 25457* (US, BISH, Fo); Mogmog I., *Lessa 17* (BISH); Sorlen I., 0–5 m, *Evans 394* (US, BISH, Fo); Asor I., 1 m, *Fosberg 46444* (US, BISH, Fo, NY).

Fais: 1–3 m, *Evans 362* (US, BISH); Yldow, W

coast near S end of island, 1 m, *Fosberg 46730* (US, BISH, Fo).

Eauripik: Siding I., 1.5 m, *Fosberg & Evans 47092* (US, BISH, Fo).

Woleai: Sholiap (Saliap) I., 4 m, *Fosberg 47047* (US, BISH, Fo, NY); Utagal I., 1-2 m, *Wong 30* (US, BISH, Fo, NY, L); Falalop I., 3-5 m, *Evans 489* (US); Falalis I., *Alkire 2* (US).

Faraulap: Faraulap I., 1 m, *Fosberg & Evans 47314* (US, BISH, Fo).

Ifaluk: Falarik I., *Abbott & Bates 5* (US, BISH), 140 (US, BISH); Ifaluk I., 3 m, *Fosberg 47207* (US).

Lamotrek: Lamotrek I., 3 m, *Fosberg & Evans 46769* (US, BISH, Fo, NY).

Satawal: S side, 1-2 m, *Fosberg 46841* (US, BISH, Fo, NY).

Puluwat: Puluwat I., *Niering 1961:3*.

Namonuito: Ono I., 0-3 m, *Evans 1036* (US, BISH, Fo); Magur I., 0-3 m, *Evans 934* (US, BISH, Fo, NY); Onari I., 0-3 m, *Evans 965* (US); Piseras I., *Evans 889* (US, BISH, Fo, NY).

Murilo: Murilo I., 0-3 m, *Evans 1227* (US); Ruo I., 0-3 m, *Evans 1150* (US, BISH, Fo, NY).

Nomwin: Nomwin I., 1-2 m, *Fosberg 24585* (US, BISH, Fo, NY); *Evans 1071* (US, BISH, Fo); Fananu I., 0-3 m, *Evans 1089* (US, BISH, Fo).

Truk: s.l., *Koidzumi* in 1915 (TI); *Takamatsu s.n.* (BISH); "Arch. d'Hogoleu ou de Roug," *Le Guillou 2* (P). Dublon [Natsushima]: *Takamatsu 122* (BISH). Tol: *Hosokawa 1937:202*. Tadiu: *Hosokawa 1937:202*. Ulalu (Romonum) I., 4 ft [1.2 m], *Wong 162* (US, BISH, A). Pueles I., *Anderson 799* (US, BISH, Fo). Pis I., 1-2 m, *Fosberg 24617* (US, BISH, Fo, NY, L); 3-5 m, *Evans 851* (US, BISH, Fo, NY).

Nama: 0-3 m, *Evans 1327* (US).

Losap: Losap I., 0-5 m, *Evans 1369* (US).

Namoluk: Namoluk I., 1-2 m, *Marshall 55* (US).

Etal: Anderson sight record.

Lukunor: Anderson sight record.

Satawan: Moch I., *Anderson 940* (US, BISH, Fo, NY, L).

Nukuoro: Christian 1899:332; *Kaujema I.*, 5 ft [1.5 m], *Hosaka 3457* (US, BISH, Fo, NY); *Sinu-*

kutai I., 1-2 m, *Fosberg 26179* (US, BISH, Fo, NY, L); *Deahu I.*, *Carroll 35* (US); *Deungaa-gelegele I.*, *Carroll 61* (US); *Sungalohu I.*, *Carroll 2* (US).

Kapingamarangi: *Niering 615*; *Hare I.*, *Niering 728* (US); 1 m, *Fosberg 26063* (US, BISH, Fo, NY, L); 7 ft [2.1 m], *Hosaka 3437* (US, BISH, Fo); *Tariha I.*, *Niering 662* (US, Fo); *Taringa I.*, *Niering 504* (US, BISH, Fo); *Pepeio I.*, *Niering 616* (US, Fo); *Werua I.*, *Niering 685* (US).

Ant: Glassman 1953:304.

Ngatik: *Riesenberg 1948:427*.

Ponape: Christian 1899:331; *Ledermann 13974* (K); *Sabic-to*, *Hosokawa 6131* (Fo); *Langar I.*, *Glassman 2401* (US, BISH); *Na I.*, *Takamatsu 855* (BISH); *Nanmatol I.*, *Matalanim Dist.*, 1-3 m, *Fosberg 26391* (US, BISH, Fo, NY, L); *Narlap I.*, 3 ft [1 m], *Hosaka 3558* (US, BISH, Fo, NY).

Mokil: Christian 1899:344; *Manton I.*, *Glassman 2595* (US, BISH).

Pingelap: *St. John 21462* (BISH).

Kusaie: s.l., *Kamiya 235* (TI); *Kanehira 1366* (FU); *Utua*, *Takamatsu 372* (BISH).

MARCUS ISLAND.—*Tuyama 1938:425*.

WAKE ISLAND.—*Pollock & Bryan 20* (BISH, A, K); *Gaston* in 1952 (BISH); *Fosberg 33616* (US).

MARSHALL ISLANDS.—*Chamisso 1821:145*; *Radack Is.*: *Chamisso* in 1822 (LE); *Eschscholtz s.n.* (LE).

Pokak: *Pokak I.*: *Fosberg 34524* (US).

Bikar: *Bikar I.*: *Fosberg 34573* (US).

Eniwetok: *Aitsu I.*: *St. John 23790* (US, BISH). *Aniyaanii I.*: *Taylor 46-1271* (US); *St. John 23422* (BISH, A). *Aoman I.*: *Fosberg 24361* (US, BISH, Fo, NY, L). *Bijjiri I.*: *St. John 23823* (US, BISH). *Bogombogo I.*: *Taylor 46-1308* (US). *Bogon I.*: *St. John 23764* (BISH). *Elugelab I.*: *Taylor 46-1322* (US). *Engebi I.*: *Fosberg 24397* (US, BISH, Fo, NY, L). *Eniwetok I.*: *Fosberg 24291* (US, BISH, Fo, NY, L). *Igurin I.*: *Fosberg 24314* (US, BISH, Fo, NY, L). *Jieroru I.*: *Taylor 46-1247* (US). *Rigili I.*: *St. John 23751* (US, BISH); *Rainey s.n.* (US, Fo). *Rujoru I.*: *Taylor 46-1327* (US). *Runit I.*: *St. John 23847* (BISH); *Taylor 46-1266 A* (US, NY, A). *Japtan I.*: *Fosberg 24336* (US, BISH, Fo, NY, L).

Bikini: *Airukiraru I.*: *Taylor 46-1157* (US, G).

Bokonofuaaku I., *Taylor 46-1059* (US, A). Enirikku I., *Taylor 46-1036* (US, NY). Enyu I.: *Taylor 46-1010* (A, G, US, NY, BISH). Ionchebi I.: *Taylor 46-1105* (US, G). Rochikarai I.: *Taylor 46-1069* (US, BISH). Namu I., *Taylor 46-1121* (US).

Ailinginae: Sifo I.: *Fosberg 36677* (US, BISH, Fo).

Rongelap: Rongelap I.: N of village, *Baker 11* (MINN). Ringtonman I.: *Taylor 46-1374* (US).

Rongerik: Bock I.: *Taylor 46-1411* (US). Lato-back I.: *Taylor 46-1416* (US).

Taka: Taka I.: *Fosberg 33720* (US).

Utirik: Utirik I.: *Fosberg 33715* (US).

Ujelang: Ujelang I.: *Fosberg 34194* (US).

Ujae: Bock I.: *Fosberg 34318* (US).

Wotho: Wotho I.: *Fosberg 34275* (US).

Lae: Lae I.: *Fosberg 34090* (US).

Kwajalein: Bigej (Bennett) I.: *Fosberg 26516* (US, BISH, Fo, NY, L). Kwajalein I.: *Fosberg 26471* (US, BISH, Fo, NY, L), *48069* (US, BISH, Fo, NY, L).

Ailuk: Ailuk I.: *Fosberg 33933* (US).

Jemo: *Fosberg 33887* (US).

Likiep: Likiep I.: *Fosberg 26999* (US, BISH, Fo).

Wotje: (Romanzoff Is.): de Candolle 1839: 505 (citing Chamisso).

Aur: Tabal I.: *St. John 21391* (BISH).

Ailinglapalap: Bikajle I.: *Fosberg 26799* (US, BISH, Fo, NY, L).

Majuro: Majuro I.: W end, *Fosberg 26988* (US, BISH, Fo, NY, L).

Arno: Ine I.: *Hatheway 789* (US, BISH, Fo); *Anderson 3609* (US).

Kili: Kiste 1968:74.

Jaluit: Engler 1897:226; Schumann & Lauterbach 1901:594 (citing Schwabe); Volkens 1903: 91 (citing Schwabe, Volkens, Schnee); *Koidzumi* in 1915 (TI); *St. John 21691* (BISH); Jaluit I., S of Jabor, *Fosberg 26702* (US, BISH, Fo, NY, L).

NAURU ISLAND (Nawodo).—Schumann 1888: 222 (citing Finsch); Volkens 1903:91 (citing Jensen, Finsch); Yarren: *Burges K35* (NSW, K); Meneng, *Fosberg 58622* (US, BISH); plateau above N end of Anibare Bay, 50–60 m, *Fosberg 58761* (US).

BANABA (OCEAN) ISLAND.—Grimble 1957:27; *Rhone 26* (NSW).

GILBERT ISLANDS.—Mueller 1876:59 (citing Jensen).

Butaritari I.: *Herbst & Allerton 2713* (US).

Marakei: Marakei I.: *Moore 68* (US).

Abaiang: Luomala 1957:93.

Tarawa: Betio, *Adair 22* (US); Bikenibeu I.: *Herbst & Allerton 2665* (US); *Catala 5* (P).

Nonouti: Tetua, ca 200 m von Lagunen-Ufer, *Koch 10* (US).

Tabiteuea: Utiroa hospital, *Luomala 1* (BISH).

Onotoa: *Moul 8023* (BISH), *8024* (US); N island *8283* (BISH).

COMPOSITAE

Annual or perennial herbs, shrubs, vines, or trees; leaves opposite or alternate, simple or divided, never articulate-compound; with or without stipule-like expansions of the leaf-bases; flowers in involucrate heads (capitula), sessile on an enlarged receptacle, in some genera subtended by chaff-like bracts, flowers of one or both of two kinds, tubular "disc flowers," with 4- to 5-lobed corollas, and "rays" or "ray flowers," with corollas split down one side and enlarged limb, usually strap-shaped or ligulate, usually 4- to 5-toothed at apex, heads basically of three kinds—"discoid," with only disc flowers, "radiate," with the outer ring of flowers in the head ligulate, the inner of disc flowers, and "ligulate," having entirely ray flowers; calyx, called pappus, modified to a ring of bristles, awns, or scales (paleae), or to a truncate collar, or absent altogether, or a double ring, or one or two scales, these organs frequently enlarged in fruit; stamens 5, inserted on the corolla, the filaments free, the anthers usually united into a tube or ring; ovary inferior, with one basal ovule, style filiform, divided at apex into two stigmatic branches; fruit a nut, correctly called a cypsela, more commonly called an achene, is dry, indehiscent, usually crowned by the persistent pappus, single-celled, with a single seed free from the wall.

One of the largest of plant families, practically

cosmopolitan in distribution; many species widely distributed and weedy. Well represented in Micronesia mostly by weedy exotics, but a few species indigenous.

Key to Genera of Compositae in Micronesia

(Key is artificial and applies only to genera included as represented in Micronesia)

1. Pappus of numerous hairs or bristles 2
 2. Involucre of one principal series of linear phyllaries, with or without an outer reduced series or calyculus at base 3
 3. Calyculus lacking *Emilia*
 3. Calyculus present 4
 4. Vines with radiate heads *Pseudogynoxys*
 4. Erect herbs with discoid heads *Crassocephalum*
 2. Involucre of more than one series of phyllaries, either subequal and laterally overlapping or spirally imbricate 5
 5. Plants vine-like 6
 6. Herbaceous twiners, leaves opposite *Mikania*
 6. Woody scramblers, leaves alternate *Vernonia*
 5. Plants not vine-like, erect herbs or shrubs 7
 7. Heads discoid or rays inconspicuous 8
 8. Very large herbs with deeply lobed leaves, heads several cm or more across *Cynara*
 8. Small, not coarse, herbs, or shrubs, heads 1 cm or less across 9
 9. Outer florets filiform, 2-4 denticulate at summit 10
 10. Shrubs, florets lavender or light purple *Pluchea*
 10. Resinous herbs, florets yellow *Blumea*
 9. Outer florets with limb campanulate or funnellform with 4-5 lobes or teeth. 11
 11. Leaves opposite *Chromolaena*
 11. Leaves alternate 12
 12. Phyllaries in few series, subequal, heads with 2 types of flowers, white or with yellowish disk *Conyza*
 12. Phyllaries in few to many series, strongly unequal and spirally imbricate, heads purple with only discoid flowers *Vernonia*
 7. Heads conspicuously radiate 13
 13. Marginal florets in the heads ligulate, central florets tubular 14
 14. Pappus segments plumose *Tridax*
 14. Pappus segments not plumose 15
 15. Phyllaries narrowly lanceolate, in one principal series, not notably imbricate *Erigeron*
 15. Phyllaries broader, conspicuously imbricate, green-tipped *Aster*
 13. All florets in the head ligulate, plants lactiferous 16
 16. Involucres 5 mm or less long, phyllaries in 2 distinct series, plant delicate *Youngia*
 16. Involucres 8 mm or more long, plants stiff, robust 17
 17. Achenes with a narrow neck or beak, pappus bristles not connate, falling separately *Lactuca*

17. Achenes not at all prolonged into a neck or beak, pappus bristles connate at base, falling as a unit **Sonchus**
1. Pappus of several (seldom more than 5) awns or bristles, or of spines, or of scales or teeth 18
18. Leaves alternate or basal 19
19. Heads small, involucre less than 5 mm long 20
20. Heads radiate **Glossogyne**
20. Heads discoid 21
21. Heads becoming broader than high, leaves green beneath, not deeply cut. **Epaltes**
21. Heads not notably broader than high, leaves white beneath, deeply cut. **Artemisia**
19. Heads medium to large, involucre over 5 mm long 22
22. Heads discoid only 23
23. Heads on a spike-like inflorescence, not subtended by large bracts, two largest pappus awns with a reverse curve part way up **Pseudo-Elephantopus**
23. Heads arranged in secondary heads, subtended by broad cordate-triangular leaflike bracts, pappus awns all straight **Elephantopus**
22. Heads radiate 24
24. Heads both sessile in axils of inflorescence branches and on ends of peduncles, all florets ligulate **Cichorium**
24. Heads not so arranged, florets of 2 kinds, both ligulate and tubular in same head 25
25. Heads very large, about 15 cm across when fully expanded, peduncle swollen and fistulose above, receptacular bracts large, achenes with 2 awns. **Tithonia**
25. Heads at most about 6 cm across (except in some large green-house Chrysanthemums), peduncles not swollen, receptacular bracts few or absent 26
26. Phyllaries wide, obtuse, with broad scarious margins ... **Chrysanthemum**
26. Phyllaries foliaceous, without scarious margins **Gaillardia**
18. Leaves opposite 27
27. Heads discoid 28
28. Pappus of 5 aristate hyaline scales **Ageratum**
28. Pappus otherwise 29
29. Pappus of 2-3 short barbed awns **Bidens**
29. Pappus of 3-5 short blunt processes viscid at apex **Adenostemma**
27. Heads radiate 30
30. Heads mostly axillary or on axillary peduncles 31
31. Heads sessile; subsessile or peduncle very short **Synedrella**
31. Heads notably pedunculate 32
32. Phyllaries fimbriate-margined, receptacular bracts broad **Spilanthes**
32. Phyllaries entire-margined, receptacular bracts hairlike **Eclipta**
30. Heads on terminal peduncles (sometimes a few also axillary) or in terminal corymbs or panicles 33
33. Phyllaries conspicuously spirally imbricate, in several to many series, black-margined, ray corollas persistent, falling with achenes **Zinnia**
33. Phyllaries in 1-several series, not conspicuously imbricate, not black-margined, ray corollas not persistent 34
34. Phyllaries in 1 series, connate **Tagetes**
34. Phyllaries in 2-several series, not connate 35

- 35. Leaves appearing to be compound 36
 - 36. Pappus lacking, achenes not beaked **Coreopsis**
 - 36. Pappus of 2 or 3 small awns, these usually barbed or if these lacking, achenes beaked **Cosmos**
- 35. Leaves clearly simple 37
 - 37. Pappus scales linear-lanceolate, plumose **Tridax**
 - 37. Pappus of 2 or 3 short awns or bristles or lacking 38
 - 38. Phyllaries fimbriate-margined, receptacle conical to columnar, its bracts bilobed **Spilanthes**
 - 38. Phyllaries entire, receptacle flat to convex, its bracts acute or obtuse 39
 - 39. Leaves variable, usually more or less trilobed, pappus a crown of small fimbriate scales raised on a constricted short neck **Wedelia**
 - 39. Leaves serrate, not lobed, pappus lacking or of a single short deciduous awn, not on a raised podium **Wollastonia**

Adenostemma J. R. & G. Forster

Adenostemma J. R., & G. Forster, Char. Gen. 89, t. 45, 1776.

Low spreading to ascending sparsely branched herbs; leaves opposite, triangular to ovate-lanceolate, margins crenate to sharply dentate or serrate, petiolate; heads discoid, whitish, as broad or broader than high, disposed in few- to many-headed, very open, irregularly corymbosely often many times branched panicles, involucre of sev-

eral series of herbaceous subequal free or coherent bracts, receptacle hemispheric, naked, alveolate; corolla tube short, limb campanulate, lobes short, 5; anther tube included, style branches exerted; achenes obovoid or oblong, prismatic, pappus of 3-5 short, spreading processes, with viscous thickened blunt apices.

A pantropical genus of very uniform habit, with about 20 species, several of them widely distributed, two of these known from Micronesia.

Key to Micronesian Species

- Style branches thick, somewhat flattened, blunt, narrowly oblong to spatulate or clavate; corolla limb narrowly campanulate, hairy outside in upper half; achenes with muriculae abrupt, usually separated at base **Adenostemma lanceolatum**
- Style branches thin, flattened, broadly linear; corolla limb broadly campanulate, hairy over entire outer surface; achene with broad rather low muriculae, contiguous at base **Adenostemma viscosum**

Adenostemma lanceolatum Miquel

Adenostemma lanceolatum Miquel, Fl. Ind. Bot. 2:24, 1856.
Adenostemma lavenia var. *lanceolatum* (Miquel) Koster, Blumea 1:474, 1935.
Adenostemma fastigiatum sensu auct. Micr. [non (Blume) de Candolle, Prodr. 5:111, 1836].
Adenostemma parviflorum sensu Kitamura, Acta Phytotax. Geo-

bot. 10:71, 1941 [non (Blume) de Candolle, Prodr. 5:111, 1836].
Adenostemma lavenia var. *typicum* sensu Koster [non (L.) O. Kuntze, Rev. Gen. Pl. 1:304, 1891].
Adenostemma lavenia sensu Okabe, Nankyo 2:41, 48, 1943.—Kanehira, Enum. Micr. Pl. 429, 1935.—Luomala, Bishop Mus. Bull. 213:49, 1953.—Stone, Micronesica 6:579-580, 1971 [non (L.) O. Kuntze, Rev. Gen. Pl. 1:304, 1891].

Adenostemma viscosum sensu Lessing, *Linnaea* 6:106, 1831.—Endlicher, *Ann. Wien. Mus. Naturgesch.* 1:168, 1835.—Volkens, *Bot. Jahrb.* 31:477, 1901.—Safford, *Contr. U.S. Nat. Herb.* 9:175, 1905.—von Prowazek, *Deutsch. Marianen* 121, 1913.—Merrill, *Phil. Jour. Sci. Bot.* 9:153, 1914.—Kitamura, *Acta Phytotax. Geobot.* 10:70, 1941 [non Forst., *Char. Gen.* 90, 1775.]

Puberulent to subglabrous somewhat fistuloustemmed herb; leaves ovate to narrowly ovate or rarely broadly lanceolate with acute to usually bluntly acute apex, somewhat attenuate base, blade somewhat decurrent on petiole, principal nerves 3, united near base, often 1–2 pairs farther up, margin subserrate to irregularly coarsely serrate; panicle shortly pilose, 5–25 cm across, irregularly trichotomous, central or more rarely one of side branches reduced or poorly developed, branching irregularly alternate, peduncles 0.5–2 cm long, heads 8–10 mm wide, 5–6 mm high, phyllaries broadly lanceolate to lance-oblong, blunt, shortly and sparsely glandular-pilose; corolla tube slender except conical base, glandular, throat funnel-form-campanulate, pilose outside in upper part, lobes triangular-ovate, becoming reflexed; style shaft glabrous, branches well-exserted, spreading, thick, somewhat flattened, broadly linear, blunt; achene 2.5–3 mm long, prismatic, turbinate-thickened; pappus processes 3, short, rather thick, white, spreading, glandular part oblong.

A widely distributed Malesian-Pacific species, found on most Micronesian islands at low or medium elevations.

It grows in disturbed shaded weedy places, in coconut and breadfruit groves, and along paths, even around dwellings.

VERNACULAR NAMES.—

bulak manuk (Marianas: von Prowazek, 1913)
bulak-manuk (Guam: Stone, 1971: "The name 'bulak manuk' . . . is of Philippine origin")
chaguan-manuk (Guam: Stone, 1971)
chaguan-chiba (Guam: Stone, 1971)
aciyuwa (Yap: *Wong* 343)
ruburb (Yap Okabe, 1943)
habwölebwöl (Ulithi: *Lessa* 93)
atu'iot (Ifaluk: *Fosberg* 47210)
iatuiat (Ifaluk: *Abbott & Bates* 3)
walumarzhin (Ifaluk: *Abbott & Bates* 124)

yatuyet (Ifaluk: *Abbott & Bates* 3)
yoelusook (Satawal: *Fosberg* 46910)
singopua (Lukunor Atoll: *Anderson* 2180)
amuel (Satawan Atoll: *Anderson* 964)
siritai (Kapingamarangi: *Niering* 670)
mafulful (Kusaie: *Fosberg* 26599)
bulibulgas (Lae: *Fosberg* 34025)
puluwulukaj (Ailinglapalap: *Fosberg* 26842)
bwillbwilikaj (Arno Atoll: *Anderson* 3615)
bwillbwilikej (Arno: *Stone* 1097)
märuko (Jaluit: *Fosberg* 26767)
rauti (Gilberts: Luomala, 1953)

USES.—"Has a variety of uses for women's afterbirth medicine" (Palau: *Salsedo* 293). Leprosy: Leaves and stems of "ruburb" and leaves of "do-doan" [*Helminthostachys zeylanica*] are crushed together and applied to the affected part (Yap: Okabe, 1943).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—De Candolle, 1836:111 (citing Haenke).

Rota: Hosokawa ms. (citing Hosokawa 7648).

Guam: Endlicher, 1935:168; Lessing, 1831:106; Merrill, 1914:153 ("collected by Chamisso fide Safford").

CAROLINE ISLANDS.—Palau: Babeldaob: Mele-gojok, *Tuyama* in 1939 (TI); Markyoku, *Hatusima* 5034 (FU); Koror: Beraber, *Salsedo* 293 (US). Peliliu: Kitamura, 1941:70; *Hatusima* 4749 (FU).

Yap: Volkens 1901:477 (citing Volkens 99); Okao-kanhu, *Hosokawa* 8921 (BISH, Fo); Atelieu, *Tuyama* in 1939 (TI); 25 ft [8 m], *Wong* 343 (US, BISH); Tomil, 100 ft [30 m], *Hosaka* 3255 (US, BISH); Dalipebinau, 8 m, *Cushing* 407 (US).

Ulithi: Mogmog I., *Lessa* 93 (BISH).

Woleai: Falalis I., 1–2 m, *Fosberg* 47001 (US).

Ifaluk: *Abbott & Bates* 3 (BISH); Ifaluk I., 2 m, *Fosberg* 47201 (Fo); Falalap I., *Abbott & Bates* 124 (US, BISH).

Satawal: 2 m, *Fosberg* 46910 (Fo).

Nama: 305 m, *Evans* 1313 (US).

Namoluk: Leor Village, *Anderson* 916 (US, BISH, Fo, NY).

Lukunor: Lukunor I., *Anderson* 2180 (US, BISH, Fo); Oneap I., *Anderson* 2076 (US, BISH, Fo).

Satawan: Moch I., *Anderson* 964 (US, BISH, Fo,

NY, L); Ta I., *Anderson 1071* (US, BISH, Fo, NY).
Kapingamarangi: *Niering 670* (US).

Ponape: Kitamura, 1941:71 (citing *Hatusima 10913*); Napit, 300 m, *Hatusima 10919* (FU).

MARSHALL ISLANDS.—Radack: Lessing, 1831: 106; Endlicher, 1835; 168; *Chamisso s.n.* (K).

Lae: Lae I., *Fosberg 34025* (US).

Ailinglapalap: Bikajle I., 1–3 m, *Fosberg 26842* (US, BISH).

Majuro: Darrit I., 1–2 m, *Fosberg 26931a* (US, BISH).

Arno: Chiran I., *Stone 1097* (Fo); Ine I., *Anderson 3615* (US); Matolen I., *Hatheway 777* (US, BISH).

Jaluit: Imruj I., in shade in interior, 1–3 m, *Fosberg 26767* (US, BISH).

GILBERT ISLANDS.—Luomala, 1953:106 (a very doubtful record).

Some of the above specimens were examined before we distinguished *A. lanceolatum* from *A. lavenia*. Most are probably *A. lanceolatum* but some might be *A. viscosum*. The same is true of records cited from the literature.

Adenostemma viscosum Forster

Adenostemma viscosum Forster, Char. Gen., 90, pl. 45, 1775.
Adenostemma lavenia auct. Micr. pro minore parte [non (L.)
O. Kuntze, Rev. Gen. Pl. 1:304, 1891].

Spreading to ascending herb, subglabrous to somewhat pilosulous, especially near nodes, pubescence slightly viscous; leaves ovate, acute, base attenuate to a petiole several cm long, blade triplinerved, margin crenate or crenate-serrate, teeth with minute glandular mucros; panicle irregularly loosely corymbiform, 4–6 times branched, peduncles 1–2 cm long; heads 4–5 mm high, 6–10 mm wide; involucre bracts oblong to ovate-obtuse, sparsely pilosulose, veiny; corolla white or pinkish, corolla tube short, glandular, limb broadly campanulate, pilose over entire outer surface, lobes obtuse; style shaft glabrous, branches linear-oblong to linear-spatulate, not conspicuously thickened; achenes obovoid-oblong prismatic, light brown, densely warty, warts contiguous at base, each tipped by a viscous gland or droplet; pappus processes 3, stiffly spreading,

straight or slightly curved, viscous glandular part narrowly obovoid.

A widely distributed Indo-Pacific and African species, differing from *A. lanceolatum* especially in the ornamentation of the achenes and in the corolla shape and hairiness. From Micronesia, known with certainty only from Palau, Kusaie, and perhaps Murilo, the achenes of the Murilo collection not very typical but possibly not quite mature; possibly also from Nomwin.

Growing along trails and roads, and in Murilo, around taro pits.

VERNACULAR NAMES.—
shedan (Nomwin: *Evans 1048*)
mafulful (Kusaie: *Fosberg 26599*)

USES.—Medicine made from it given women at childbirth (Kusaie, *Fosberg 26599*.)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

CAROLINE ISLANDS.—Palau: Ngaraard, Babeldaob, *Otobed PW-10175* (US).

Murilo Atoll: Murilo Islet, 3–5 m, *Evans 1256* (US, UH).

Nomwin Atoll: Nomwin I., *Evans 1048* (US) (specimen practically useless).

Kusaie: N ridge of Mt. Matanta, above Tafonshak village, N side of island, *Fosberg 26599* (US); Lele Islet, sea level, *Glassman 2705* (US) (intermediate in all features between *A. lanceolatum* and *A. viscosum*).

Two other specimens from Kusaie—near Maa-rem, 400 m, *Hatusima 11173* (FU) and Mt. Matente, *Hosokawa 9478* (BISH, A)—may be this species.

Ageratum L.

Ageratum L., Gen. Pl., ed. 5, 363, 1754 [1753]; Sp. Pl., 839, 1753.—Johnson, Ann. Mo. Bot. Gard., 58:6–88, 1971.—King & Robinson, Phytologia, 24:112–117, 1972.

Aromatic herbs; leaves simple, opposite; heads discoid, in more or less flat-topped cymose panicles; involucre hemispheric, bracts imbricate in 2–3 series; receptacle with or without chaffy bracts; style branches elongate, obtuse; achenes

prismatic 5-angled; pappus of about 5 scales, obtuse or with awns, or coroniform, sometimes absent.

A small, principally tropical American genus, of which two species are widely introduced in warm countries, one of them common in Micronesia.

Ageratum conyzoides L.

Ageratum conyzoides L., Sp. Pl., 839, 1753.—Volkens, Bot. Jahrb., 31:477, 1901; Notizbl., 4:91, 1903.—Safford, Contr. U.S. Nat. Herb., 9:176, 1905.—von Prowazek, Deutsch. Marianen, 121, 1913.—Merrill, Phil. Jour. Sci. Bot., 9:152, 1914.—Koidzumi, Bot. Mag. Tokyo, 29:255, 1915.—Koster, Blumea, 1:484-490, 1935.—Kanehira, Enum. Micr. Pl., 429, 1935.—Hosokawa, Bull. Biogeogr. Soc. Japan, 7:202, 1937.—Krämer in Thilenius, Erg. Süds. Exp., II B, 10(1):390, 1937.—Okabe, Jour. Jap. For. Soc., 23:271, 1941; Jour. Anthropol. Soc. Nippon, 56:417, 1941; Nankyo, 2:8, 18, 1943.—Glassman, Bishop Mus. Bull., 209:97, 1952; Pac. Sci., 7:301, 308, 1953.—Fosberg & Sacht, Atoll Res. Bull., 92:37, 1962.—Otobed, ms., 1967; Guide List Plants Palau Is., 1971.—Stone, Micronesica, 6: 580, 1971.—Fosberg, Falanruw, & Sacht, Smithsonian Contr. Bot. 22:42, 1975.

A very aromatic herb, erect, pilose; leaves triangular-ovate, truncate to very broadly cuneate at base, apex bluntly acute to obtuse, margins crenate, main nerves at base 3, forking and forming a network, abundant sessile glands on under surface; heads pale mauve to white, discoid, in small clusters, these cymosely paniculate, peduncles up to 2 cm long, with a number of subulate bracts near summit; heads about 5 mm high and 5-7 mm wide, 60-75 flowered; involucre bracts oblong, subequal in length except for 1 or 2 reduced linear-subulate outer ones per head, obtuse to acute, but abruptly acuminate, ciliate distally only very sparsely so below, with 2 very strong ribs, sparsely pilose; receptacle without bracts; corolla gradually dilated, very scantily puberulent, lobes oblong-obtuse; the style branches filiform, blunt, exceeding the corolla, and not strongly recurved; achenes black, about 1.5-1.7 mm long, 5-angled, conspicuously prismatic, almost glabrous but sparsely scabrous on angles; the pappus paleae 5, oblong-lanceolate,

each narrowed into a long arista or awn, the margins appressed, hispidulous-ciliate, the awn scabridulous, somewhat exceeding corolla, whole pappus about 2-2.5 mm long.

A very common pantropic weed, found in disturbed places generally; in Micronesia found on most high islands and a few atolls, in the Marianas (Agrigan, Pagan, Alamagan, Guguan, Sari-gan, Anatahan, Saipan, Rota, Guam), Carolines (Palau, Yap, Fais, Truk, Ponape, Pingelap, Kusaie), Marshalls (Jaluit). Micronesian plants seem to belong to var. *conyzoides* following Johnson, 1971:26-31.

USES.—The young leaves are used with coconut oil to treat boils (Palau: *Salsedo* 272). Abscess: to make the head burst, apply coconut oil first, then the leaf of "agmakk" is stuck over it (Palau: Okabe, 1941, 1943). Leaves of this plant combined with those of *Ocimum sanctum* L. and coconut oil are used as a skin lotion (Pingelap: Glassman, 1953).

VERNACULAR NAMES.—

mumutung (Guam: *Nelson* 39; Stone, 1971)
 agmak (Palau: Okabe, 1941)
 agmakk (Palau: Okabe, 1943)
 ngmak (Palau: *Evans* 85; *Blackburn* E 1; *Salsedo* 272; *Fosberg* 32054; *Hardy* 85; Otobed, 1967, 1971)
 lamër ne pan ni pin (Yap: *Wong* 336)
 uárong nga lípesedj (Fais: Krämer, 1937)
 amshiiip (Truk: Hosokawa 1937, Glassman, 1953)
 ololopon (Truk: *Fosberg* 26038)
 omusiip (Truk: *Wong* 197)
 opolopon (Truk: Glassman, 1953)
 oponupon (Truk: *Pelzer* 84; Glassman, 1953)
 pusen-koh (Ponape: *Glassman* 2408)
 pokaniko (Pingelap: *Glassman* 2660)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—von Prowazek, 1913:121; Koster, 1937:490.

Agrigan: Midwest coast, 20 ft [6 m], *Falanruw* 2322 (US).

Pagan: E of Fresh Water Lake, *Fosberg* 31413 (US, BISH, Fo).

Alamagan: Around Partido village, *Fosberg* 31688 (US, BISH, Fo); SSW coast, 0-200 ft [60 m], *Falanruw* 1946 (US).

Guguan: 200–300 ft [60–90 m], *Falanruw* 1849 (US).

Sarigan: N from village, 175–250 m, *Evans* 2414 (US); near village 10–100 m, *Evans* 2356 (US); S of ridge, 150 ft [45 m], *Falanruw* 1722 (US); near anchorage, sea level, *Falanruw* 1784 (US).

Anatahan: NW village, 0–200 ft [60 m], *Falanruw* 1638 (US).

Saipan: Kanehira 1935: 429; *Kanehira* 994 (FU); Kitamura, 1941:71.

Rota: Slopes W of As Malote, S side of island, 150 m, *Fosberg* 31913 (US); near highest point of island, 500 m, *Evans* 2112 (US).

Guam: Merrill, 1914:152; s.l., *G.E.S.* 1 (US, BISH); *McGregor* 484 (US, BISH); *Nelson* 39 (BISH); Tarzan Falls [Ylig River], *Stone* 3878 (GUAM); near Sagua River, 100 m, *Stone* 4200 (GUAM); Mt. Tenjo, *Rodin* 545 (US); Agat, *Rivera* in 1967 (BISH); between Utamac and Cetti Bay, *Evans* 1539 (US); Fonte, N of Mt. Alutom, edge of weedy thicket, 175 m, *Fosberg* 25430 (US, BISH, Fo, NY, L); Mt. Alutom, 800 ft [245 m], *Hosaka* 3076 (US, BISH); near Finaguayac, *Moran* 4485 (UC, Fo); Mt. Jumullong Manglo, 300–325 m, *Evans* 234 (US); Chaot, *Falanruw & Salomon* 949 (US).

CAROLINE ISLANDS.—Palau: *Nakao* in 1941 (KYO); *Yamada* in 1925 (TI); *Kanehira & Nisida* in 1934 (FU); *Richardson* 6 (US). Babeldaob: Garudoku, *Takamatsu* 1402 (BISH); Ollei, *Hardy* 85 (US, BISH, Fo). Arakabesan, low altitude, *Kanehira* 347 (BISH). Koror: *Kanehira* 119, 201, 347 (all FU); *Blackburn E* 1 (US); near entomology laboratory, *Salsedo* 272 (US); Ngerabe'ed, 5–10 m, *Fosberg* 32054 (US, BISH, Fo, NY, L).

Yap: Volkens, 1901:477 (citing Volkens 60); clay soil, 120 ft [35 m], *Wong* 336 (US, NY, BISH); in oppido-Dogol, *Tuyama* in 1939 (TI).

Fais: Krämer, 1937:390.

Truk: *Koidzumi* in 1915 (TI); sandy places, 3 ft [1 m], *Wong* 197 (US, BISH). Moen (Harushima): *Takamatsu* 174 (BISH); head of Nomenuk Bay, *Fosberg* 26038 (US, BISH, Fo). Dublon (Natsushima): *Takamatsu* 272 (BISH). Tol (Ton): *Pelzer* 84 (US); *Hosokawa*, 1937:202.

Ponape: s.l., *Moore* 102 (US); *Ledermann* 13870

(K); Kiti District, Nipit, *Takamatsu* 892 (BISH); *Nakao* in 1941 (KYO); One, *Nakao* in 1941 (KYO); Parkier, *Kanehira* 729 (FU, TI); Anapengpa, *Takamatsu* 729 (BISH); Colonia, 10 m, *Wong* 62 (US, BISH, Fo, NY, L); Meohikku, 100 ft [30 m] *Hosaka* 3482 (US, BISH, Fo, NY); Agric. Exper. Sta, *Glassman* 2408 (US, BISH).

Pingelap: Pingelap I., *Glassman* 2660 (US, BISH).

Kusaie: Mt. Wakapp, *Takamatsu* 425 (BISH).

MARSHALL ISLANDS.—Jaluit: Volkens 1903: 91; *Koidzumi* in 1915 (TI); Jaluit I., Jabor, *Fosberg* 39485 (US).

NAURU ISLAND.—Lake Buada, *Fosberg* 58652 (US, BISH).

Artemisia L.

Artemisia L., Gen. Pl., ed. 5, 367 1754 [1753]; Sp. Pl., 845, 1753.

Herbs or shrubs, variously aromatic; leaves alternate, usually variously lobed or divided; heads small, rather few-flowered, discoid, usually in panicles, erect to usually nodding or pendent; phyllaries imbricate in few series; receptacle without bracts but sometimes hairy; florets bisexual or unisexual, in various arrangements, often in same head; pistillate corollas 2–3 lobed, staminate and hermaphrodite 5-lobed; achenes obovate, subterete to compressed, variously striate or ribbed; pappus inconspicuous or wanting.

A large genus, mainly of the temperate Northern Hemisphere, one species rather commonly introduced into the tropics, including Micronesia.

Artemisia vulgaris L.

Artemisia vulgaris L., Sp. Pl., 848, 1753.

An aromatic herb with deeply cut leaves, white beneath; panicles of small discoid heads of minute, dull whitish or brownish flowers.

Artemisia vulgaris L. var. *vulgaris*

The European typical variety is not known from Micronesia.

***Artemisia vulgaris* var. *indica* (Willdenow)
Maximowicz**

Artemisia vulgaris var. *indica* (Willdenow) Maximowicz, *Mélanges Biol.*, 8:536, 1872.—Okabe, *Bull. Trop. Indust. Inst. Palau*, 5:14, 1940.

Artemisia indica Willdenow, *Sp. Pl.*, 3:1846, 1803.

Artemisia vulgaris sensu Endlicher, *Ann. Wien. Mus. Naturgesch.*, 1:169, 1835.—Schumann & Lauterbach, *Fl. deutsche Schutzg. Süds.*, 601, 1901.—Safford, *Contr. U.S. Nat. Herb.*, 9:188, 1905.—von Prowazek, *Deutsch. Marianen*, 121, 1913.—Merrill, *Phil. Jour. Sci. Bot.*, 9:153, 1914.—Kanehira, *Enum. Micr. Pl.*, 429, 1935.—Stone, *Micronesica* 6:574, 1971.—Fosberg, *Falanruw, & Sachet, Smithsonian Contr. Bot.* 22:42, 1975 [non L., *Sp. Pl.*, 848, 1753].

Herb, rather bushy-branched when well developed, said to be stoloniferous, stems arachnoid above, becoming glabrate below; leaves chartaceous, ovate to elliptic in general outline, pinnately incised, lobes ascending, wide at base, tapering, toothed with few, upward pointing, ovate teeth, several rudimentary lobes on sides of petiole, green almost glabrous above, densely white wooly beneath; panicles numerous, branches strongly ascending, capitula many, tending to be secund on panicle branches, ascending to somewhat nodding, campanulate, 3.5–4 × 2–2.5 mm; phyllaries ovate, obtuse, center greenish, especially in lower ones, in 3–4 not well-marked series, margins broad, scarious, erose to fimbriate; florets slightly exceeding involucre, outer ones pistillate with long-exserted divergently ascending style branches, these somewhat flattened, apices blunt or rounded; inner florets hermaphrodite, upper part of corolla narrowly campanulate, lobes triangular, recurved or reflexed; anther appendages scarious, triangular-acuminate; style branches recurved; achenes oblong, subprismatic; pappus reduced to a scarious ring (from *McGregor 423* (US) from Guam).

An Asiatic plant, treated by some botanists as a distinct species, but not very different from the European var. *vulgaris*. Known in Micronesia from garden plants, abundant in graveyards, rarely becoming established; planted for medicinal purposes, as well as for a spice used in cooking. Said by Okabe (1940) to be indigenous to Palau, but this seems unlikely. It has been known from

Guam as a cultivated plant since the early 19th century (Endlicher, 1835:169, citing Gaudichaud and Lessing collections.)

It now grows in the Marianas (Agrigan, Anatahan, Guam) and Carolines (Palau, Ulithi, Woleai, Satawal).

USES.—Used against amoenorrrhea and abdominal pain (Marianas: von Prowazek, 1913). Planted and used medicinally (Agrigan: *Falanruw 2157*); (Guam: Safford, 1905). Widely cultivated for its aromatic foliage used in cooking (Guam: Stone, 1971). “The whole plant is boiled in water and taken for the remedy of pains in the abdomen, vomiting and purging, and of metrorrhagia. It is used as a styptic, and moxa cautery” (Okabe, 1940). Made into “leis because of odor, also [used] medicinally” (Ulithi: *Fosberg & Evans 46368*). Used for maremars (Woleai: *Evans 450*).

VERNACULAR NAMES.—

hierba de manzanilla (Marianas: von Prowazek, 1913)
yerba Santa Maria (Marianas: von Prowazek, 1913)
jetbas Santa Maria (Agrigan: *Falanruw 2157*)
hierba de Santa Maria (Guam: Safford, 1905)
yebas santa Maria (Guam: *Whiting C13*)
Yerba de Santa Maria (Guam: Stone, 1971)
Yerva de Santa Maria (Guam: Schumann & Lauterbach, 1901)
iärbwas (Ulithi: *Lessa 91; Fosberg & Evans 46368*)
iarwas (Ulithi: *Fosberg 46626*)
liarburas (Woleai: *Fosberg 47032*)
niarabas (Woleai: *Evans 450*)
iärbwas (Satawal: *Fosberg 46861*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—von Prowazek 1913:121.

Agrigan: SW coast, below 300 ft [90 m], *Falanruw 2157* (US).

Anatahan: NW coast, below 250 ft [75 m], *Falanruw 1677* (US).

Guam: Endlicher 1835: 169 (citing Gaudichaud, Lesson); Merrill 1914:153; *G.E.S. 423* (BISH); *McGregor 423* (US); Chalan Pago, *Whiting C13* (US).

CAROLINE ISLANDS.—Palau: Okabe 1940:14.

Ulithi: Mogmog I., *Lessa 91* (BISH); 1–2 m, *Fosberg and Evans 46368* (US); Falalap I., 1–3 m, *Fosberg 46626* (US).

Woleai: Falalop I., 0.5 m, *Evans 450* (US);
 Sholiap I., 1–2 m, cult., *Fosberg 47032* (US).
 Satawal: 2 m, planted, *Fosberg 46861* (US).

Aster L.

Aster L., Gen. Pl., ed. 5, 373, 1754 [1753].

Herbs, rarely shrubs, mostly perennial; leaves alternate, mostly with entire or toothed margins; heads usually in panicles or corymbs, or racemes, usually radiate; involucre of usually unequal

imbricate phyllaries, these usually with green tips; ray flowers in 1 or rarely 2 series, white to purple, disk yellow, often turning reddish to maroon purple; receptacle without bracts; achenes more or less compressed; pappus of capillary bristles in 1 or rarely 2 series.

A large, very widespread genus, mostly North Temperate, a few species commonly cultivated. Two of these rarely found in gardens in Micronesia, these quite variable and not easy to distinguish with certainty.

Key to Micronesian Species of Aster

- Inflorescence bracts broadly elliptic, upper parts glabrous or almost so, phyllaries closely appressed, outer ones not herbaceous nor squarrose ***A. laevis***
- Inflorescence bracts narrowly oblong, upper parts sometimes more or less pubescent, phyllaries tending to be spreading, outer ones green, somewhat squarrose ***A. novi-belgii***

***Aster laevis* L.**

Aster laevis L., Sp. Pl., 876, 1753.

Upright herb, glabrous or almost so, tending to be glaucous; basal leaves tapering to winged petioles, blades lanceolate to elliptic or ovate, cauline sessile and clasping, upper ones or bracts of inflorescence broad, elliptic, or ovate, sessile; panicle narrowly dome-shaped; involucre campanulate, 5–8 mm high, phyllaries firm, closely appressed, tips green, narrowly rhombic; rays violet, disk yellow; pappus buff, 3–4 mm long.

Native of eastern North America, differs from *A. novi-belgii* in being glabrous and slightly glaucous, and in having wider, more clasping upper leaves and appressed inflorescence bracts. Cultivated in the tropics.

GILBERT ISLANDS.—Tarawa, Betio, *Adair 59* (US).

***Aster novi-belgii* L.**

Aster novi-belgii L., Sp. Pl., 877, 1753.—Stone, Micronesica, 6:575, 1971.

Perennial herb from a hard rhizome several mm thick, stem tending to be slightly pubescent

above; leaves at first in a basal rosette, basal ones lanceolate, with narrowly winged petioles, not or scarcely toothed, cauline somewhat clasping at base, linear-lanceolate; panicle with many heads, its branches ascending, heads on branchlets somewhat corymbose; involucre campanulate to turbinate, lower phyllaries green, somewhat curved outward, inner ones with conspicuous green distal portion; rays blue violet, disk yellow turning dark reddish; pappus 4–6 mm long.

An eastern North American species occasionally planted in gardens, rare in Micronesia.

VERNACULAR NAME.—Aster (English) (Guam: Stone, 1971)

MARIANAS ISLANDS.—Rota: Songsong village, cult., *Evans 2245* (US).

Guam: Tamuning, cult., *Stone 4169* (GUAM); *Fosberg 35346* (US).

***Bidens* L.**

Bidens L., Gen. Pl. ed. 5, 362, 1754 [1753].

Herbs or shrubs, rarely vine-like or small trees, with a strong, somewhat resinous or carrotty odor when broken; leaves opposite, simple to variously

divided; heads solitary or in terminal panicles, these often flat-topped; heads radiate or rarely discoid; involucre of two series of bracts, outer green, inner chafflike; flowers subtended by chaffy bracts on the receptacle; rays sterile or rarely pistillate; stamen filaments glabrous; style branches acute to subulate; achenes long, pris-

matic, slightly to strongly obcompressed, not usually winged; pappus of two or three (rarely more) sharp, stiff, usually barbed awns or variously reduced or lacking.

A large genus with species in most warm and temperate regions, several very weedy; two widespread ones introduced into Micronesia.

Key to Micronesian Species of *Bidens*

- | | |
|---------------------------------|--|
| 1. Heads rayless | <i>B. pilosa</i> var. <i>pilosa</i> |
| 1. Heads radiate | 2 |
| 2. Rays 1 cm or less long | <i>B. pilosa</i> var. <i>minor</i> |
| 2. Rays over 1 cm long | <i>B. alba</i> |

Bidens alba (L.) de Candolle

Bidens alba (L.) de Candolle, Prodr., 5:605, 1836.

Coreopsis alba L., Sp. Pl., 908, 1753.

Coreopsis leucanthema L., Amoen. Acad., 4:291, 1759.

Bidens leucantha (L.) Willdenow, Sp. Pl., 3:1719, 1803.

Bidens pilosa var. *radiata* Schultz-Bipontinus in Webb & Berthelot, Hist. Canar., III, 22:242, 1836-1850 [July 1844].—Stone, Micronesica, 6:583, 1971.

Bidens pilosa sensu Falanruw & Payne, Life on Guam, 33, 42-43, 44, 71, 1976 [non L., Sp. Pl., 832, 1753].

Square-stemmed erect herb; leaves opposite, pinnately 3-5 foliolate or leaves simple, leaflets ovate, acute, serrate, surface rather dull, faintly glaucous when alive; heads few, terminal on fairly long peduncles, or upper part of plant tending to be paniculate; rays prominent, white, 5-6, elliptic-obovate; achenes brownish-black, linear, antrorsely hispid above, with two divergent retrorsely barbed stiff awns.

Often regarded as a variety of *B. pilosa* but with showy prominently radiate heads and behaving very differently, ecologically.

Pantropical, known in Micronesia from the Marianas (Guam), Carolines (Palau, Ponape), Marshalls (Kwajalein).

VERNACULAR NAME.—Guam daisy (English).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Guam College campus, *Stone 3794* (GUAM); *Pedrus 45* (US);

Tumon Heights, *Fosberg 46221* (US); cliff above Uruno Pt., *Moran 4528* (BISH); Yigo, *Krauss* in 1957 (BISH); *334* (BISH); above Tarague Beach, 140 m, *Fosberg 35671* (US, BISH, Fo, NY, L); 1 km E of Agafo Gumas, 165 m, *Fosberg 35506* (US, BISH, Fo, NY, L); Barrigada village, *Falanruw 835* (BISH); *Stone 5048* (GUAM) abnormal fasciated plant; Tagachan Beach, *Pedrus 13* (US).

CAROLINE ISLANDS.—Palau: Babelthuap I., Irai airfield, *Woolwich 107* (US). Angaur I., 0.6 mi [1 km] E of boat basin, 3 m, *Canfield 415* (US).

Ponape: Kolonia, *Fosberg 58430* (US, BISH).

MARSHALL ISLANDS.—Kwajalein I., near airstrip, *Fosberg 36639* (US, BISH, Fo).

Bidens pilosa L.

Bidens pilosa L., Sp. Pl., 832, 1753.—Walker & Rodin, Contr. U.S. Nat. Herb., 30:466, 1949.—Stone, Micronesica, 6: 583, 1971.—Randall, Tsuda et al., Univ. Guam Mar. Lab. Tech. Rept., 12:55, 1974.—Kami et al., Univ. Guam Mar. Lab. Tech. Rept., 16:12, 1974.

Similar to *B. alba* but leaves greener, firmer, more acuminate; heads fewer, discoid (or, in variety *minor*, with small whitish rays); outer involucre bracts shorter than inner, blunt; achenes linear, black, antrorse-hispid distally with 2-3 stiff, short, retrorsely barbed awns, these persistent and serving as an effective dispersal mechanism.

A pantropical species, presumably of American origin, introduced into Micronesia, known from

the Marianas (Saipan, Rota, Guam), Carolines (Palau, Ulithi, Woleai), Gilberts (Butaritari).

VERNACULAR NAME.—Beggars-tick, Spanish needle (English).

Bidens pilosa* L. var. *pilosa

As described above, heads discoid.

The common, very weedy, pantropical form of the species.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: 1-2 km S of Mt. Tapotchau, 230 m, *Fosberg 25195* (US, BISH); Tapotchau Mt., 450-500 m, *Fosberg 31775* (US, BISH, Fo).

Rota: Sonson, 1-10 m, *Fosberg 25072* (US, BISH).

Guam: Andersen Air Force Base, *Moran 4470* (UC, Fo); Uruno Pt., *Moran 4528* (UC, Fo); slopes of Mt. Machanao, Ritidian Pt., 180 m, *Bryan 1173* (US, BISH, K); Haputo Pt., *Necker 15* (US).

CAROLINE ISLANDS.—Palau: Peliliu, N landing, 1-2 m, *Fosberg 31953* (US, BISH).

Ulithi: Falalap I., *Fosberg 46504* (BISH, Fo); Fassarai I., in village, 2 m, *Fosberg and Evans 47410* (US).

Woleai: Wottagai (Utagal) I., in village, 1-2 m, *Fosberg 47065* (US, BISH, Fo).

GILBERT ISLANDS.—Butaritari: Butaritari I., *Herbst and Allerton 2719* (US, BISH).

***Bidens pilosa* var. *minor* (Blume) Sherff**

Bidens pilosa var. *minor* (Blume) Sherff, Bot. Gaz., 80:387, 1925.

Bidens sundaica var. *minor* Blume, Bijdr., 914, 1826 [as *sundaicus*].

Differs from var. *pilosa* in the presence of small whitish ray flowers.

Widespread, weedy, often occurs with and intergrades with var. *pilosa*.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: 1-2 km S of Mt. Tapotchau, 230 m, *Fosberg 25193* (US, BISH).

Rota: Slopes above As Malote, 250 m, *Fosberg 25095* (US); slopes W of As Malote, S side of island, 150 m, *Fosberg 31910* (US, BISH).

CAROLINE ISLANDS.—Palau: *Richardson 78* (US).

MARSHALL ISLANDS.—Eniwetok: Enewetak I., *Lamberson* in 1977 (Mi).

***Blumea* A. P. de Candolle**

Blumea A. P. de Candolle, Guill. Arch. Bot. 2:514, 1833 [nom. cons.].—*Randeria*, *Blumea* 10:176-317, 1960.

Annual or perennial herbs, undershrubs or shrubs, usually erect, often woolly or pubescent; leaves simple, lower or both surfaces pubescent, margins subentire to serrate or dentate, or lobed; heads discoid, solitary or in glomerules or panicles, usually yellow; involucre cylindrical or hemispheric, phyllaries numerous, multiseriate, pubescent on outer surface, scarious-margined; receptacle glabrous to pubescent, ebracteate; marginal florets pistillate, inner ones bisexual or functionally pistillate; outer corollas tubular, filiform, 2- or 4-lobed; inner florets dilated upward, 4- or 5-lobed; anthers the same number as corolla lobes; style branches short, blunt; achenes oblong, 5-10 ribbed or obscurely 4-angled; pappus of one series of slender barbellate bristles.

An Old World tropical genus of about 50 species, mainly south and east Asiatic and Malesian, several introduced or doubtfully native in Micronesia. A very difficult genus taxonomically.

Key to Micronesian Species of *Blumea*

- 1. Leaves usually lobed in basal portion ***B. sinuata***
- 1. Leaves not or scarcely lobed, bases tapering 2
 - 2. Leaves tomentose to woolly on lower surface 3

3. Leaves spatulate obovate, margins not strongly toothed *B. hieraciifolia*

 3. Leaves broadly elliptic, toothed *B. lacera*
 2. Leaves green, sparsely pilose beneath, coarsely cuspidate-toothed, large
 coarse plants *B. milnei*

***Blumea hieraciifolia* (D. Don) de Candolle**

Blumea hieraciifolia (D. Don) de Candolle in Wight, Contr. Bot. Ind., 15, 1834.—Randeria, *Blumea*, 10:246–248, 1960.

Erigeron hieracifolium D. Don, Prodr. Fl. Nepal., 172, 1825.

Blumea sericans (Kurz) Hooker f., Fl. Br. Ind., 3:262, 1881.—Kitamura, Acta Phytotax. et Geobot., 10:71, 1941.

Blumea barbata var. *sericans* Kurz, Jour. Asiatic Soc. Bengal, 46, pt. 2(2):188, 1877.

Erect woolly herb to 0.5 m tall, usually unbranched, leaves obovate to spatulate-obovate, basal ones to 13 × 3.5 cm, apex rounded to obtuse, base gradually narrowed, more or less cuneate or attenuate into a short petiole, margin somewhat dentate or denticulate, somewhat woolly beneath, sparsely pubescent, glabrate and green above, cauline leaves becoming smaller upward, uppermost bractlike; heads congested into a globose woolly mass with one to several smaller glomerules on the peduncle, heads 6–10 mm wide and high; phyllaries many, imbricate, linear to oblanceolate-linear, silvery on inner surface when reflexed, purplish tipped, hyaline margined, apex caudate or aristate-acuminate; receptacle glabrous; flowers yellow, shorter than involucre; achenes narrowly oblong, glabrous or slightly pubescent, ribbed; pappus whitish spreading.

South Asia to Ryukyu Islands and Palau.

CAROLINE ISLANDS.—Palau: Babeldaob: Kamusetu, Almonogui, *Kanehira & Hatusima 4956* (FU); Arukoron-sogen, *Hosokawa 7020* (A, BISH).

***Blumea lacera* (Burman f.) de Candolle**

Blumea lacera (Burman f.) de Candolle in Wight, Contr. Bot. Ind., 14, 1834.—Randeria, *Blumea*, 10:267, 1960.—Stone, *Micronesica*, 6:588, 1971.

Conyza lacera Burman f., Fl. Ind., 180 t. 59 f.l., 1768 [as *Conyza*].

Herb to 1 m tall, unbranched or with many

small flowering branches, stems variously pubescent, glandular to woolly; leaves ovate to broadly elliptic, mostly cauline, petiolate, rounded to obtuse at apex, contracted and decurrent on petiole at base, margin dentate to serrate, not or weakly lobed, lower surface pilose or even somewhat woolly to glandular or sparsely pilosulous, upper surface green, puberulent or glandular to sparsely pilosulous; heads pedunculate to glomerate, in open to compact cylindrical panicles, often small panicles on many small ascending branches in upper axils, together forming a large paniculate upper part of plant; capitula 5–6.5 mm wide, to 7 mm high; phyllaries linear-acuminate, glandular-puberulent without; receptacle glabrous; bisexual florets 3–4.5 mm long, 5-lobed, lobes puberulent and glandular outside; achenes oblong, subangulate, not or scarcely ribbed, pappus white, to 4 mm long.

Paleotropical to as far east as Australia and New Guinea, on Guam probably introduced.

MARIANAS ISLANDS.—Guam: s.l., *Astrolabe 31* (P); Mt. Tenjo, *Rodin 540* (US).

***Blumea milnei* Seemann**

Blumea milnei Seemann, Fl. Vitiensis, 141, t. 27, 1866.

Aromatic herb to 3.5 m tall; leaves alternate, elliptic, acuminate, margins closely to sparsely and coarsely toothed, teeth strongly cuspidate, thin, somewhat more pubescent beneath, stem pubescence as well as that of leaves variable; panicles of heads terminal and in upper axils and becoming large, compound, with bracts becoming completely reduced above, panicle dome-shaped; involucre bracts linear-lanceolate, 5 mm long; flowers described as greenish yellow, yellow or white, old ones with pappus as long as involucre fluffing out to light, dirty brown, fluffy balls about 1–1.3 cm across; achenes oblong, sericeous, ribbed.

New Guinea to Samoa and Kusaie, growing in dense wet forests at relatively high elevations.

CAROLINE ISLANDS.—Kusaie: Mt. Fenkol (Mt. Crozer), *Takamatsu 381* (BISH); Mt. Matanta (Buache) summit ridge, 550–600 m, *Fosberg 26611* (US, BISH, K, MO).

Blumea sinuata (Loureiro) Merrill

Blumea sinuata (Loureiro) Merrill, Trans. Amer. Phil. Soc. n.s., 24(2):388, 1935.—Kitamura, Acta Phyt. Geob., 10: 71, 1971.—Hosokawa, ms., n.d.

Gnaphalium sinuatum Loureiro, Fl. Coch., 2:497, 1790.

Blumea laciniata (Roxburgh) de Candolle, Prodr., 5:436, 1836.—Merrill, Phil. Jour. Sci. Bot., 15:544, 1919.—Kanehira, Enum. Micr. Pl., 429, 1935.—Randeria, *Blumea*, 10:258–260, 1960.—Stone, *Micronesica*, 6:588, 1971.

Blumea mollis sensu Merrill, Phil. Jour. Sci. Bot., 9:153, 1914.—Kanehira, Enum. Micr. Pl., 429, 1935.—Stone, *Micronesica* 6:588, 1971 [non (D. Don) Merrill, Phil. Jour. Sci. Bot., 5:395, 1910].

Herbs to 1–1.5 m tall, often branched, stems pilose and usually glandular, terete, ribbed; leaves mostly cauline, becoming smaller upward, ultimately bractlike, blades ovate to obovate, or elliptic, apex obtuse to rounded, base contracted into a petiole, margin cuspidate-dentate, usually strongly lobed toward base with patent runcinate to lyrate lobing, lobes oblong to lanceolate, both surfaces sparsely pilose and glandular, glabrate, uppermost leaves or bracts from entire to strongly dentate; heads in an open to narrow or even almost spike-like panicle, often with clusters of heads in upper leaf-axils; capitula 6–8(–10) mm wide, 4–7 mm high; phyllaries linear-oblong to linear-lanceolate, abruptly acute to acuminate, greenish to purplish dorsally, notably pubescent, costa dark, body of bract lighter, hyaline margins narrow or absent; receptacle minutely pubescent around the alveolae; achenes brown, ribbed, narrowly oblong, pubescent.

A weedy species common in South Asia east to the Solomons, probably introduced into Polynesia and into Micronesia, where it is known from the Marianas (Saipan, Tinian, Guam) and Carolines (Palau and Kusaie).

VERNACULAR NAMES.—

titima (Guam: Hosokawa, n.d.)
tagathiki (Palau: Hosokawa n.d.)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: Kitamura, 1941: 71.

Tinian: Kitamura, 1941:17.

Guam: Merrill, 1914:153; 1919:544; s.l., *Nelson 338* (NY); *G.E.S. 341* (US, BISH); top of Mt. Tenjo, 320 m, *Bryan 1257* (BISH); Atangtano, along Piti-Sumay Road, sea level, *Bryan 1067* (US, BISH); Comarianas (Fonte), above Asan, hills N of Mt. Alutom, 175 m, *Fosberg 25433* (US, BISH).

CAROLINE ISLANDS.—Palau: Babeldaob: Kamusetu, Almonogui, *Kanehira and Hatusima 4885* (FU).

Kusaie: Near Maarem, 400 m, *Hatusima 11142* (FU).

Chromolaena de Candolle

Chromolaena de Candolle, Prodr., 5:133, 1836.—King & Robinson, *Phytologia*, 20:196–214, 1970.

Eupatorium L., Gen. Pl. ed. 5, 363, 1754 [pro parte excl. typ.]
Osmia Schultz-Bipontinus, *Pollachia*, 22–24:251, 1866.

Herbs or shrubs; leaves opposite; inflorescence laxly to densely corymbose; heads discoid; involucre cylindrical, of three to six series of erect, closely imbricate deciduous phyllaries; receptacle naked; corollas tubular, dilated somewhat upward, 5-lobed, lobes glandular on outer surfaces; style branches elongate, obtuse at tips; achenes 3–5 angulate; pappus of one series of about 40 capillary scabrous bristles.

A primarily Neotropical genus of many species, only one, so far, introduced into Micronesia.

Chromolaena odorata (L.) King & Robinson

Chromolaena odorata (L.) King & Robinson, *Phytologia*, 20: 204, 1970.

Eupatorium odoratum L., Syst. ed. 10, 1205, 1759.—Stone, *Micronesica*, 2:141, 1967; *Micronesica*, 6:581, 1971.—Fosberg, Falanruw, & Sacht, *Smithsonian Contr. Bot.*, 22: 42, 1975.

Large branched, often tangled, shrub or suffrutescent herb to 2 or more m tall, young stems and under sides of leaves moderately to densely tomentose, branching opposite, divaricate; leaves

triangular-ovate, triplinerved, apices somewhat acuminate, base obtuse or even rounded to acutish, upper margins subentire to strongly coarsely serrate, or subhastate, lower margins entire, upper surface hispid-scabrous, lower soft-tomentose, petioles slender, up to 1 cm long, longer on large leaves on young shoots; heads borne in large, open divaricately branched thyrsoid glandular-pubescent panicles, with reduced leaves at the first and second order ramifications, then very much reduced bracts; heads in rather close clusters, at ends of primary panicle branches; involucre cylindro-campanulate, narrow, about 1 cm long, phyllaries very unequal, seemingly spirally arranged, oblong to oblong-lanceolate, acute, subscariosus with 3 or 5 strong, green parallel nerves, margins scariosus, lacerate distally; florets white to lavender, about 30, corolla very narrowly funnellform, about 5 mm long, with 5 triangular lobes; anther tubes included, style-branches elongate, papillate, blunt; achene black, slender, 4 mm long, prismatic with 5 sharp white antrorsely sparsely hispid angles; pappus a crown of antrorsely barbellate bristles about equalling corolla.

In their dismemberment of the large genus *Eupatorium*, King and Robinson (1970:204) regard this species as belonging to the genus *Chromolaena* de Candolle. This seems to us a reasonable disposition and we accept it here, without any implication as to the desirability of these authors' other *Eupatorium* segregates.

A pantropical weed of American origin, new to Micronesia. By 1965 it had become common along roadsides at the north end of Saipan; in Rota said to have been introduced about 1975.

Known from the Marianas (Agrigan, Saipan, Tinian, Rota, Guam) and Carolines, very recently found in Ponape.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: SW coast, below 300 ft [90 m], *Falanruw* 2191 (US).

Saipan: s.l., *Sproat* 5 (US); Marpi, along fence row, *Courage* 45 (US); open roadside, *Courage* 60 (US); Marpi Pt., 15 m, *Fosberg* 47717 (US).

Tinian: North Field, *Kondo* 17 (BISH).

Rota: Sabana Rd., SW of airport, *Fosberg & Moore* 58215 (US).

Guam: Apra, 1/2/64, *Wade* 22 (US, GUAM); Ipa Beach road, *Moore* 542 (US); Tumon Heights, 40 m, *Evans* 1451 (US).

CAROLINE ISLANDS.—Ponape: Near Mobil Oil Facility, *Falanruw* 3237 (US).

Chrysanthemum L.

Chrysanthemum L., Gen. Pl. ed 5, 379, 1754 [1753], Sp. Pl., 887, 1753.

Pyrethrum Zinn, Cat. Pl. Gott. 414, 452, 1757.

Dendranthema (de Candolle) Des Moulins, Actes Soc. Linn. Bordeaux, 20:561, 1855.

Aromatic herbs, rarely suffrutescent or even shrubby; leaves alternate, entire to variously dentate, lobed, or dissected; heads usually medium sized or large, on long peduncles or in corymbiform panicles, usually radiate; involucre campanulate or hemispheric to broad, flattish, of several series of unequal, imbricate, wide, obtuse, broadly scariosus-margined phyllaries, the margins often brownish; marginal flowers in one series (to many in cultivars), pistillate, ligules usually conspicuous, apices dentate or not; disk flowers with limb from scarcely enlarged to cylindro-campanulate, 4–5 lobed; anthers obtuse and entire at base; style branches truncate and hairy at apices; achenes 5–10 costate, terete to angled, those of rays trigonous, of disc laterally compressed, apices naked or with cuplike or crownlike paleaceous pappus, rarely shortly lobed.

A very large and complex largely North Temperate and South African genus, often variously divided, a few species cultivated and hybridized, forming a myriad of very fancy cultivars, mostly lumped under the name *Chrysanthemum* × *morifolium*, several forms of which are known to have been cultivated in Micronesia.

Chrysanthemum × *morifolium* Ramatuelle

Chrysanthemum × *morifolium* Ramatuelle, Jour. Hist. Nat., 2: 240, 1792.—Stone, Micronesica, 6:575, 1971.

Matricaria chamomilla Blanco, Fl. Filipinas, 631, 1837.—Safford, Contr. U.S. Nat. Herb., 9:319, 1905 [non L., Sp. Pl., 891, 1753].

Pyrethrum sinense (Sabine) de Candolle, Prodr., 6:62, 1838.—Safford, Contr. U.S. Nat. Herb., 9:363, 1905.

Chrysanthemum indicum sensu Safford, Contr. U.S. Nat. Herb., 9:225, 1905.—Merrill, Phil. Jour. Sci. Bot., 9:153, 1914.—Kanehira, Enum. Micr. Pl., 430, 1935 [non L., Sp. Pl., 889, 1753].

Pyrethrum indicum sensu Safford, Contr. U.S. Nat. Herb., 9:363, 1905 [non (L.) Cassini, Dict. Sci. Nat., 44:149, 1826].

Dendranthema morifolium (Ramatuelle) Izvelev in Komarov, Fl. U.R.S.S. 26:373, 1961.

Somewhat suffrutescent herbs, stems somewhat tomentose, young growth more markedly so, some forms densely tomentose, leaves petiolate with semiclasping or clasping often expanded bases, these often auriculate or hastate-auriculate, auricles in some cases strongly 1–2 toothed, blades ovate in general outline 3–5 (–7) lobed, shallowly or deeply so, lobes dentate or serrate, under surface tomentose, petiole shorter than or as short as blade, expanded base variously developed; heads mostly in corymbiform panicles or solitary; involucre 1–2 cm across, phyllaries oval or obovoid, scarious margins very broad, apices rounded; rays variously colored, basically in one series but in many cultivars many or all flowers ligulate; disk yellow or greenish yellow when present.

Cosmopolitan in distribution, many diverse cultivars, several of them are or have been planted in Guam and Rota.

USES.—An infusion of the flowers is used as a remedy for intermittent fevers, and by women for hysteria and monthly irregularities (Guam: Safford, 1905). Boiled with rice it is used as a cure for diarrhea (Guam: *Evans 1696*).

VERNACULAR NAMES.—

mansanega (Guam: *Evans 1696*)

mansaniya (Guam: *Whiting C14*)

manzanilla (Guam: *Safford and Seale 1113*; Safford, 1905; Stone, 1971)

rosas de Japan (Guam: Stone, 1971)

rosas de Japon (Guam: *Safford and Seale 1113*)

yerba de Santa Maria (Guam: Merrill, 1914, citing *G.E.S. 326*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Rota: Songsong village, planted, *Evans 2263* (US).

Guam: Merrill 1914:153; s.l., *G.E.S. 326* (US, BISH); Manilao, *Whiting C14* (US); Agaña, *Safford & Seale 1113* (US); Agaña Spring, planted, *Evans 1696* (US); Tamuning, cult., 15 m, *Fosberg 35349* (US), *35350* (US).

Cichorium L.

Cichorium L., Gen. Pl., ed. 5, 354, 1754 [1753]; Sp. Pl., 813, 1753.

Erect, branched herbs; leaves alternate, basal ones in rosettes, entire to pinnatifid, cauline smaller, entire; heads ligulate, homogamous, sessile in axils of peduncles and on ends of peduncles; phyllaries in 2 series, outer of 5, inner 8–10; receptacle naked; florets 6 or many, all ligulate, ligules blue to white, linear-oblong, apex truncate, 5-dentate; style-branches slender, obtusish; achenes obovate, subangled, outer ones convex, striate, pappus scales minute in 1–3 series.

A small Mediterranean genus; two species widely cultivated, one becoming naturalized and weedy, one occasionally planted in Micronesia for its edible leaves. The other is the cultivated chickory, its roots used as coffee substitute, by some suspected of harmful effects, such as low-level arsenic toxicity.

Cichorium endivia L.

Cichorium endivia L., Sp. Pl. 813, 1753.—Fosberg & Sachet, Atoll Res. Bull. 92:37, 1962.

Cichorium endivia latifolia Lamarck, Encycl. Meth. 1:732, 1785.—Catala, Atoll Res. Bull. 59:111, 1957.

Annual or biennial, erect, glabrous; basal leaves many in a rosette, cauline reduced upward on stem; heads about 3–4 cm across, violet blue, some of them subtended by leafy bracts.

There are a number of garden varieties distinguished by differences in leaf form, texture, and taste. The species is apparently not known in a wild state. “Endive” was reported from Jaluit, in

the Marshalls, by Fosberg and Sachet, on the basis of a sight report by MacKenzie, but it is not known which variety was seen.

Cichorium endivia* L. var. *endivia

Basal leaves broad, margins crenate.

This is probably the form commonly known as var. *latifolia* (the Escarole). It doubtless originated in cultivation, possibly from *Cichorium intybus* L. as a wild ancestor, but this is only speculation at best.

In Micronesia known only from the Gilberts, where it is cultivated in gardens of Europeans (Catala, 1957).

***Cichorium endivia* var. *crispum* Lamarck**

Cichorium endivia var. *crispum* Lamarck, Encycl. Meth. 1:732, 1785.—L., Sp. Pl., 813, 1753 [as β *Endivia crispa*].—Catala, Atoll Res. Bull. 59:111, 1957.
Cichorium crispum Miller, Gard. Dict., ed. 8:1768.

Basal leaves crispate, subpinnatifid.

The garden endive or chicory; cultivated only, known in Micronesia from the Gilbert Islands, where it has been seen planted in gardens of Europeans (Catala, 1957).

***Conyza* Lessing**

Conyza Lessing, Syn. Gen. Comp., 203, 1832 [nom. cons.];

non *Conyza* L., Gen. Pl. ed 5, 370, 1754 [1753].—Cronquist, Bull. Torrey Bot. Cl. 70:629–632, 1943; 74:150, 1947.
Erigeron L., Gen. Pl. ed. 5, 371, 1754 [1753] [pro parte].
Leptilon Rafinesque, Am. Mo. Mag., 268, 1818.

Usually herbs with alternate leaves; inflorescence usually paniculate; heads obscurely radiate, usually small; involucre campanulate to somewhat urceolate, phyllaries in 2 or more unequal series, lanceolate to linear; receptacle flattish to convex, naked; pistillate flowers numerous, tubular or very shortly and minutely ligulate; corollas shorter than or subequal to pappus; bisexual flowers usually few, central, corollas slender, tubular limb narrowly campanulate, shortly 5-dentate; anthers at base obtuse and entire; style branches flattened, with short to long lanceolate appendages; achenes small, compressed, faces with 1 or no nerves; pappus of 1 whorl (or rarely 2) of slender setae.

A large tropical genus, especially developed in Africa, with 2 cosmopolitan weedy species, both found in Micronesia. These have usually been included in *Erigeron* L., sometimes in the segregate genus *Leptilon* Rafinesque. *Conyza* differs from *Erigeron* in that the ligules in *Conyza* are very reduced or wanting. The two genera are not very clearly separated, but are commonly regarded as distinct.

Key to Micronesian Species of *Conyza*

- Plants grayish to greenish hairy, basal leaves usually serrate, phyllaries hirsute or hispid, 4–6 mm long, florets 60–120, pappus dull buff to light brown, denuded receptacle 2–4 mm across ***Conyza bonariensis***
Plants green, glabrous or slightly pilose or hispid, phyllaries glabrous or almost so, 2.5–5 mm long, florets 40–50, pappus buff to white, denuded receptacle 1.5–2 mm wide ***Conyza canadensis***

***Conyza bonariensis* (L.) Cronquist**

Conyza bonariensis (L.) Cronquist, Bull. Torrey Bot. Club, 70: 632, 1943.—Fosberg, Atoll Res. Bull., 67:19, 1959.—Fosberg & Sachet, Atoll Res. Bull., 123:15, 1969.—Stone, Micronesica, 6:576, 1971.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:42, 1975.

Erigeron bonariense L., Sp. Pl., 863, 1753.
Erigeron albidus (Willdenow ex Sprengel) Gray, Proc. Am. Acad. Arts. Sci., 5:319, 1862.—Hosokawa, Trans. Nat. Hist. Soc. Formosa 32, No. 220:20, 1942.
Conyza albida Willdenow ex Sprengel, Syst., 3:514, 1826.
Erigeron sumatrense Retzius, Obs. 5:28, 1789 [1788].—Sagami, Pac. Sci. 15:85, 1961.

Tall, more or less grayish pubescent herb, appearing greenish to gray when dry, usually single stemmed, or few branched from base; rosette leaves oblanceolate, coarsely and somewhat irregularly serrate, stem leaves numerous, often very crowded, narrowly linear to lanceolate, entire to serrate, diminishing upward; heads in a panicle, individual peduncles subtended by small linear bracts, panicle of short ascending branches, upper ones shorter, rachis usually well exceeding lower branches, sometimes soon suppressed and the lower branches exceeding it, then making a corymbiform rather than roughly conical panicle; involucre of several unequal series of linear-acuminate hispid phyllaries, 4–6 mm long; heads appearing discoid but frequently outer ones with minute ligules; florets 60–120; pappus light brownish or dark buff to darker dull tan.

This species is extremely variable and is frequently separated into several, mainly on the nature of the inflorescence. We can find no consistency in the development or suppression of the rachis, viewed over a broad range, though most Micronesian specimens have the panicles elongate and conical, which, with usually small heads, would put them in *Erigeron floribunda* according to Burt's (1949) separation. Plants with small heads and narrow entire cauline leaves are sometimes mistaken for *C. canadensis*, and may possibly be introgressants from that species, with which it grows. Until we can find a better basis for a different arrangement, we are treating pubescent plants with hispid involucre as *C. bonariensis*, not attempting to distinguish varieties.

Cosmopolitan. In Micronesia doubtless introduced, known from the Marianas (Pagan, Guam), Carolines (Palau), Wake Island, Marshalls (Eniwetok, Kwajalein), Gilberts (Butaritari, Tarawa). Grows in open sunny disturbed pioneer situations, mostly on bare soil.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Pagan: Mt. Pagan, *Moore* 375 (US); near air strip, *Moore* 307 (US) (cited in Fosberg et al. 1975:42 as *C. canadensis*), 310 (US);

near shore of Sinalung (Inner) Lake, 10 m, *Lamouroux* 4861 (US).

Guam: NE slopes of Mt. Almagosa, 250 m, *Fosberg* 35317 (US, BISH, Fo, NY, L); between Utamac and Cetti Bay, *Evans* 1553 (US).

CAROLINE ISLANDS.—Palau: Babeldaob: Near Ngaspan, Hosokawa, 1942:20 (citing Hosokawa 9706). Peliliu: Near airstrip, 6 m, *Fosberg* 32014 (US, BISH, Fo), 47635 (US). Angaur: 25 m, *Fosberg* 25908 (US); W coast, S of phosphate works, 3 m, *Fosberg* 31962 (US, BISH, Fo); S side, 2–5 m, *Fosberg* 31973 (US, BISH, Fo, NY, L).

MARCUS ISLAND.—Sagami, 1961:85 (determined by T. Tuyama as *Erigeron sumatrensis*).

WAKE ISLAND.—Wake Islet, *Fosberg* 34463 (US); Area A, *Gaston* in 1953 (BISH); *Krauss* in 1957 (BISH); *Sachet* 897 (US).

MARSHALL ISLANDS.—Eniwetok: Eniwetok I., *St. John* 23708 (BISH).

Kwajalein: Kwajalein I., *Fosberg* 31168 (US, BISH, Fo), 31171 (US, BISH, Fo).

GILBERT ISLANDS.—Butaritari: Butaritari I., Banaki area, *Herbst & Allerton* 2770 (US, BISH).

Tarawa: Bairiki, *Sachet* 1415 (US).

Conyza canadensis (L.) Cronquist

Conyza canadensis (L.) Cronquist, Bull. Torrey Bot. Club, 70: 632, 1943.—Otobed, ms. 1967; Guide List Plants Palau Is., 1971.—Fosberg & Sachet, Atoll Res. Bull., 123:15, 1969.—Fosberg, Falanruw & Sachet, Smithsonian Contr. Bot., 22:42, 1975.

Erigeron canadense L., Sp. Pl. 863, 1753.

Erigeron canadensis var. *glabratus* A. Gray, Pl. Lindh. 2:220, 1850 (Boston Jour. Nat. Hist. 6(2):220, 1850).

Conyza canadensis var. *pusilla* (Nuttall) Cronquist, Bull. Torrey Bot. Club, 74:150, 1947.—Stone, Micronesica, 6:577, 1971 [as *pusillus*].

Erigeron pusillus Nuttall, Gen., 2:148, 1818 [non *Conyza pusilla* HBK]. *Conyza parva* Cronquist, Bull. Torrey Bot. Club, 70: 632, 1943 [nom. nov.]. *Conyza canadensis* var. *glabrata* (A. Gray) Cronquist, Bull. Torrey Bot. Club, 74:150, 1947.

Erect leafy, green annual herbs, stems somewhat pubescent to usually glabrous; larger leaves rather crowded near base, narrowly oblanceolate, smaller ones clothing stem, linear, leaves from glabrous to scabrous-hispidulous, strongly ciliate near base; upper part of plant paniculate with

numerous ascending branches, panicle rather conic in outline; heads small, 5 mm or usually less high, phyllaries unequal, linear-lanceolate, acute, glabrous or almost so, green with white margins; florets 40–50; achenes pale buff, narrowly oblong, about 1 mm long, sparsely sericeous; pappus usually buff to white.

Micronesian plants are rather uniform, varying slightly in pubescence; they have usually been referred to var. *pusillus* (Nuttall) Cronquist. However, they lack the purple tips to the phyllaries that characterize that variety. They are more pubescent than var. *glabratus* (Gray) Cronquist and the plants are usually much smaller. It seems rather difficult to discern clear varieties in this species at present, so none are recognized here.

This is a pioneer plant of open, usually bare ground, normally growing in full sun. There is some slight evidence of hybridity with *E. bonariensis*, but this is difficult to establish and the plants showing it may be merely extremes in the normal range of variation.

Known from the Marianas (Rota, Guam), Carolines (Palau), Wake Island, and Kwajalein and Majuro in the Marshalls.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Rota: E of Songsong village, 10–20 m, *Sachet 1734* (US); between Songsong and point above Aratsu Bay, 150–250 m, *Evans 1927* (US).

Guam: Com-Marianas quarry, Fonte, 180 m, *Fosberg 35206* (US, BISH, Fo, NY, L); about 1 km E of Agafo Gumas, 165 m, *Fosberg 35505* (US, BISH, Fo); about 1 mi. [1.6 km] S of Potts Junction, 140 m, *Fosberg 39273* (US, BISH, Fo, NY, L); Andersen Air Force Base, *Moran 4433* (UC, Fo); Guam College campus, *Stone 3788* (GUAM); *Pedrus 40* (US); Tumon, *Pereda 125* (BISH); Tumon Bay, *Stone 4990* (A); east of

Guam Memorial Hospital, 30 m, *Evans 225* (US); Tamuning, 35 m, *Falanruw 1274* (US); 1275 (US).

CAROLINE ISLANDS.—Palau: *Richardson 106* (US); Babeldaob: Ngatpang, *Tuyama* in 1939 (TI); Peliliu: *Emmons 95* (US, BISH); N landing, 1–2 m, *Fosberg 31960* (US, BISH, Fo, NY, L); near Bloody Nose Ridge, *Cheatham 152* (US), 153 (juvenile) (US); 2–4 m, *Fosberg 47646* (US); Angaur: N of phosphate drying plant, 8 m, *Canfield 182* (US).

Ulithi: Falalap I., 1–2 m, *Fosberg 46495* (US).

WAKE ISLAND.—Wake I., FAA Dock, *Fosberg 43536* (US); S of runway, *Sachet 897a* (US); W end of runway *McFarlane 75, 79* (both BISH).

MARSHALL ISLANDS.—Kwajalein Atoll: Kwajalein Islet, *Fosberg 36646* (US, BISH, Fo, NY), 31169 (US).

Majuro Atoll: Seen by Fosberg in 1978.

Coreopsis L.

Coreopsis L., Gen. Pl. ed. 5, 388, 1754 [1753]; Sp. Pl., 907, 1753.

Herbs, rarely shrubby; leaves opposite or sometimes alternate, entire to variously divided; heads long-pedunculate, solitary or loosely corymbosely disposed, radiate, showy; involucre of 2 series of phyllaries, outer shorter, inner separate or somewhat united at base; ligules somewhat toothed at apex, spreading; disk yellow or purple; filaments of stamens glabrous; achenes compressed, usually winged, sometime narrowly so; pappus various or absent.

A medium-sized American and African genus, closely related to *Bidens*, distinguished mostly by its usually winged achenes, which are sometimes winged in *Bidens*, also, and occasionally, wingless in *Coreopsis*.

Three cultivated species sometimes planted in Micronesia.

Key to Species of *Coreopsis* in Micronesia

1. Leaves entire or mainly trifoliolate, segments mostly lanceolate, several cm long *Coreopsis lanceolata*

1. Leaves pinnately or bipinnately divided or compound.
 2. Leaflets rhombic or ovate, leaves pinnate or scarcely bipinnate ***Coreopsis basalis***
 2. Leaflets linear, leaves usually bipinnate, at least lowest ***Coreopsis tinctoria***

***Coreopsis basalis* (Dietrich) Blake**

Coreopsis basalis (Dietrich) Blake, Proc. Am. Acad., 51:525, 1916.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.
Calliopsis basalis Dietrich in Otto and Dietrich, Allg. Gartenzeit., 3:329, (Oct) 1835.
Coreopsis drummondii (D. Don) Torrey and Gray, Fl. N. Amer., 2:345, 1842.—Okabe, Jour. Jap. For. Soc., 23:271, 1941.
Calliopsis drummondii D. Don in Sweet, Brit. Fl. Gard. 2:Pl. 315, (Dec) 1835.

Herb, erect or with branches strongly ascending, glabrous to villous or loosely woolly, stems ribbed; leaves opposite, long-petiolate, especially basal ones, pinnate or rarely lower pinnae again pinnate, segments rhombic or ovate, sessile or almost so, terminal one larger, 1–2 (–3) cm long; peduncles terminal 10–20 (–25) cm long, heads solitary at apex of peduncles 2.5–5 cm wide; involucre (1–) 1.5 cm wide, outer phyllaries green, lance-ovate to ovate, inner much exceeding the outer, ovate, scarious to brown or purplish; ligules yellow, usually with reddish or purplish base, strongly 3- to 4-toothed; disk yellow or usually dark red; receptacular bracts (chaff) thin-scarious, linear; achenes wingless, 1.5 mm long, strongly concavo-convex, convex surface minutely muriculate; pappus none.

Native of the southern United States, especially Texas; planted as an ornamental.

Grown in Jaluit (Okabe 1941:271).

USE.—Ornamental

VERNACULAR NAME.—*Coreopsis* (English)

MARSHALL ISLANDS.—Jaluit. Okabe 1941:271; Fosberg & Sachet, 1962:37 (citing Okabe).

***Coreopsis lanceolata* L.**

Coreopsis lanceolata L., Sp. Pl., 908, 1753.

Herb, stems decumbent to ascending, several from a hard root crown, glabrous or rarely pilose

below, to 5–6 dm tall; leaves 4–5 to 10 cm long, lanceolate, the lower and basal ones long-petiolate, blade entire or with 2 small pinnae from base, apices obtuse to acutish, base long attenuate, upper cauline short-petiolate or sessile; heads solitary, 3–7 cm across, yellow on peduncles 2–3 dm long; outer phyllaries green, lance-ovate to lanceolate, inner much larger, ovate or elliptic-ovate, brownish with narrow pale margin; rays cuneate-obovate, 4- to 6-toothed, yellow, disk yellow; achenes 2.5–3 mm long, black, orbicular, strongly concavo-convex, with a broad wing, outer convex surface papillate; pappus of 2 small scales.

Native of eastern United States, widely planted as an ornamental; very rarely cultivated in Micronesia (Palau).

USE.—Ornamental.

CAROLINE ISLANDS.—Palau: Koror: Ikelau, cult., *Blackburn 189* (US).

***Coreopsis tinctoria* Nuttall**

Coreopsis tinctoria Nuttall, Jour. Acad. Nat. Sci. Phil., 2:114, 1821.—Merrill, Phil. Jour. Sci. Bot., 9:153, 1914.—Stone, Micronesica, 6:583, 1971.

Annual herb, to 1 m tall, glabrous, branched; leaves opposite, lower bipinnatifid, upper pinna-tifid to entire, segments linear; inflorescence sparingly to much branched, corymbiform, with small linear bracts at ramifications; heads 2–3 cm across; involucre with outer phyllaries small, about 2 mm long, inner ovate, 5–6 mm, thick and greenish toward base, thinner and brown distally; rays obovate, obscurely to definitely toothed, teeth low, obtuse, ray yellow, or most often red brown to almost black in basal half, sometimes entirely dark, sterile; disk dark reddish black, convex; achenes linear-oblong, wingless, black, not convex; pappus wanting.

Native of central United States, frequently cultivated as an ornamental; in Micronesia planted in gardens on Guam. The form with entirely dark rays sometimes called var. *atropurpurea* Hooker, but this seems only a forma.

USE.—Ornamental.

VERNACULAR NAME.—*Coreopsis* (English)

MARIANAS ISLANDS.—Guam: s.l., Merrill 1914: 153; *G.E.S. 316* (US, BISH); *Nelson 551* (BISH); Tamuning, *Fosberg 35353* (US).

Cosmos Cavanilles

Cosmos Cavanilles, Icon. et Descr., 1:9, 1791.—Sherff, Field Mus. Bot. Ser. 8:401–447, 1932.

Annual or perennial herbs; leaves opposite,

undivided to pinnatifid or pinnatisect; heads radiate, heterogamous, on terminal peduncles or loosely corymbosely paniculate; involucre somewhat hemispheric, phyllaries in two unequal series; receptacle flat, with plane to somewhat concave bracts; ray flowers neuter, with conspicuous colored ligules, apices entire to subdentate; disk flowers tubular with cylindrical 5-toothed limb; filaments hairy; style branches thickened above, apices shortly acute; achenes linear to fusiform or somewhat 4-angled, beaked; pappus of 2–8 persistent barbellate awns.

A small genus of 25 or more species, tropical American, mostly from Mexico, several of them cultivated as ornamentals, two of these known to be planted in Micronesia.

Key to Micronesian Species of *Cosmos*

- Leaves divided, segments linear, subfleshy *C. bipinnatus*
 Leaves deeply dissected, segments lanceolate, thin, flat *C. sulphureus*

Cosmos bipinnatus Cavanilles

Cosmos bipinnatus Cavanilles, Icon. et Descr., 1:10, t. 14, 1791.

Coreopsis formosa Bonato, Pisaura Autom. Cor. Form., 22, 1793.

Bidens formosa (Bonato) Schultz-Bipontinus in Seemann, Bot. Voy. Herald, 307, 1856.

Herb to 1.5 m tall, stems somewhat 4-angled, glabrous or almost so; leaves deeply bipinnately dissected, ultimate segments linear or linear-filiform, 1 mm wide or less; heads large, solitary on long peduncles, these terminal or axillary; involucre broad, saucer-shaped, outer whorl of phyllaries ovate, acuminate, green, about 1 cm long, inner broadly ovate or elliptic, obtuse or very slightly prolonged, membranous with conspicuous white margins, otherwise bronzy, equaling or somewhat exceeding the outer; ray florets about 7–8, with ligules white, pink, lilac to maroon, broadly obovate, subtruncate up to 2.5–4 cm long, with 3 obscure or obtuse teeth; disk corollas dilated somewhat upward, teeth oblong or oblong-lanceolate, acute; anthers blackish brown with ovate-acute scarious appendages; achenes blackish, 7–16 mm long, sulcate, with a long

beak; pappus of 2–3 small retrorsely barbed awns or these lacking.

A pantropical and temperate cultivated garden ornamental not commonly seen in Micronesia.

CAROLINE ISLANDS.—Palau: Kayangl, *Salsedo 405* (US).

Cosmos sulphureus Cavanilles

Cosmos sulphureus Cavanilles, Ic., 1: 56 t. 79, 1791 [as *sulfureus* on t. 79].—Merrill, Phil. Jour. Sci. Bot., 9:153, 1914.—Sherff, Field Mus. Pub. Bot., 8:408–411, 1932.—Stone, Micronesica, 6:584, 1971 [as *sulfureus*].

Bidens sulphurea (Cavanilles) Schultz-Bipontinus in Seemann, Bot. Voy. Herald, 308, 1856.—Fosberg, Falanruw & Sachet, Smithsonian Contr. Bot., 22:42, 1975.

Herb to 1 m tall, pubescent to glabrescent; leaves usually shortly petiolate, ovate in general outline, deeply divided, pinnate to somewhat bipinnate, segments lanceolate, 2 mm or more wide, acute, mucronulate; heads on long erect peduncles; involucre to 1.5–2 cm broad, phyllaries spreading to ascending, outer whorl narrowly lanceolate, green, inner 2 or more times as long, scarious, lanceolate, acuminate; ray florets up to 10 with ligules bright orange, obovate-cuneate, to

3 cm long, rounded, obscurely 3-dentate; disk florets orange yellow, narrowly funnelform, lobes lanceolate, anthers black with brown, acute appendages; achenes linear-lanceolate; quadrangular, to 2 cm long, with a prominent scabrid beak, pappus of 1-3 stiff, retrorsely barbate, often deciduous awns.

A pantropical ornamental very commonly planted in gardens in Micronesia, in the Marianas (Agrigan, Tinian, Guam), Carolines (Woleai, Ifaluk, Satawal, Satawan).

VERNACULAR NAMES.—

cosmos (English)
barung (Woleai: *Evans 459*)
purang (Woleai: *Fosberg 47064*)
purang palap (Satawal: *Fosberg 46878*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: Gardens around village, *Fosberg 31559* (US).

Tinian: Camp Churo, 100 m, *Fosberg 24814* (US, BISH).

Guam: Merrill, 1914:153; s.l., *G.E.S. 267* (BISH); Dededo, cult., 100 m, *Fosberg 35304* (US, BISH, Fo, NY); Agaña and Pitti, *Hollett 9* (US).

CAROLINE ISLANDS.—Woleai or Ifaluk (in a garden), *Falanruw 1302* (Fo, GUAM).

Woleai: Wattagai I., planted, *Fosberg 47064* (US); Falalop I., *Evans 459* (US).

Faraulap: Faraulap I., *Fosberg & Evans 47390* (US).

Ifaluk: Ifaluk I., cult., *Fosberg 47198* (US).

Satawal: Planted, *Fosberg 46878* (US).

Satawan: Seen but not collected by D. Anderson.

Crassocephalum Moench

Crassocephalum Moench, Meth. Pl., 516, 1794.—Belcher, Kew Bull., 1955:455-465, 1955.

Erect or climbing herbs or undershrubs, leaves alternate; heads solitary or corymbose, homogamous, discoid; involucre of one principal series of phyllaries, with a calyculus or at least several reduced bracts at the base; corollas very slender,

scarcely exerted from involucre, style branches stigmatic to tip, where there is a 3/4 whorl of hairs and a long thin apical pencil of fused hairs; pappus of more than one series of capillary bristles.

A small African genus with one widespread weedy species in the Indo-Pacific region—*C. crepidioides*.

***Crassocephalum crepidioides* (Bentham) S. Moore**

Crassocephalum crepidioides (Bentham) S. Moore, Jour. Bot., 50:211, 1912.—Stone, Micronesica, 6:592, 1971.—Glassman, Bishop Mus. Bull., 209:97, 1952 [as *Sonchus oleraceus*].

Gynura crepidioides Bentham in Hooker f., Niger Flora, 438, 1849.

Erechtites missionum sensu Tuyama, Jour. Jap. Bot., 30:124, 126, 1955 [non Malme, Kongl. Svensk Vet.-Akad. Handl. 32(5):73, 1899].

Crassocephalum rubens sensu Tuyama, Jour. Jap. Bot. 31:159-160, 1956 [non (Jussieu ex Jacquin) S. Moore, Jour. Bot., 50:212, 1912].

Erect resinous-aromatic herbs with ribbed stems, sparsely tomentulose when young, subglabrate; leaves thin, basically ovate, but tending to be lyrate lobed toward base, irregularly serrate-dentate, apex acuminate or acute, base contracted to a rather short petiole; heads rather few in a loose corymbiform panicle, cernuous; involucre 12-14 mm long, principal series of about 5 phyllaries, linear, green with pale margins, a number of linear subulate bracts forming a calyculus at base; receptacle thick and fleshy; florets many; corollas almost capillary, slightly dilated at summit, not at all dilated at base, lobes 5, erect, linear lanceolate, yellowish becoming brick red, general effect deep orange; achenes cylindric, slightly contracted to base and apex, deep red brown, 10-ribbed, with appressed white hairs in furrows, at summit a flaring pale cup-shaped crown from which the pappus bristles are caducous; pappus white, soft, copious.

Apparently a native of Africa, which has spread across Asia and into the Pacific in relatively recent times. Very weedy, found in pioneer situations.

Known in Micronesia from the Marianas (Guam) and the Carolines (Palau and Ponape).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: 1 km N of Fena River Dam, 50 m, *Fosberg 35312* (US, BISH Fo, NY); Umatac, water point, base of cliff at head of valley, 100 m, *Fosberg 35411* (US, BISH Fo, NY, L); 1–1.5 km SE of Agafo Gumas, 175 m, *Fosberg 35489* (US, BISH, Fo, NY, L); just S of North Field, 150 m, *Fosberg and Anderson 32627* (US).

CAROLINE ISLANDS.—Palau: Babeldaob (Babelthuap): Gakip, 150 ft [45 m], *Hosaka 3373* (US). Urukthapel: E end of island, around lighthouse on top of peak, 200 m, *Fosberg 32040* (US, BISH). Angaur: *Tuyama* in 1939 (TI).

Ponape: Near Colonia, 75 ft [23 m], *Glassman 2581* (US, BISH).

Cynara L.

Cynara L., Gen. Pl., ed. 5, 359, 1754 [1753]; Sp. Pl. 827, 1753.

Coarse erect herbs; leaves basal and cauline, alternate, pinnately to tripinnately divided; heads large, discoid, terminal, ovoid; receptacle fleshy, flat, bristly, phyllaries broad, flat, leathery, imbricate in many series; flowers all discoid, corolla lobes 5, linear; style branches acute; achenes 3–4 angled, pappus of many plumose bristles.

A small Eurasian genus, two species of which are cultivated for their edible parts; one has been grown in Guam.

Cynara scolymus L.

Cynara scolymus L., Sp. Pl. 827, 1753.—Safford, Contr. U.S. Nat. Herb. 9:280, 1905.

Cynara cardunculus var. *scolymus* (L.) Hegi ex Stone, *Micronesica* 6:579, 1971 [probably an error for *Cynara cardunculus* ssp. *scolymus* (L.) Hegi, Fl. Mitt. Eur. 6(2): 924, 1928].

Coarse herb to 1.6 m tall; basal leaves bi- or tripinnately divided, to 70 cm long, scarcely spine-tipped; heads up to 7 cm wide, 10 cm long, flowers bluish.

The edible artichoke, which, according to Safford and Stone, has been grown, but not very successfully, in Guam.

Eclipta L.

Eclipta L., Mant., 2:157, 1771 [nom. cons.].

Herbs, annual and perennial; leaves simple, opposite, entire to dentate; heads radiate, heterogamous, borne on slender pedicels that are terminal in dichotomies of the stem, changing to axillary; phyllaries broad, triangular, few, in 2 series, receptacular bracts linear-filiform, absent in central part of receptacle; ray-flowers in 2 series, white, pistillate, the ligule small, disk flowers with tubular 4- to 5-toothed corolla, bisexual, style branches flattened, tips obtuse or triangular, ray achenes narrowly triquetrous, disk achenes thickish, lightly laterally compressed, apex with callus or pappus-ring entire, denticulate, ciliate or shortly 2-aristate, achene surfaces glabrous.

A tropical and warm-temperate weedy genus, especially of wet places, species very few, one very widespread, of which two varieties are known from Micronesia.

Eclipta alba (L.) Hasskarl

Eclipta alba (L.) Hasskarl, Pl. Jav. Rar., 528, 1848.—Volkens, Bot. Jahrb., 31:477, 1901.—Schumann & Lauterbach, Fl. Süds., 599, 1901.—Safford, Contr. U.S. Nat. Herb., 9:266, 1905.—Merrill, Phil. Jour. Sci. Bot., 9:153, 1914.—Kanehira, Enum. Micr. Pl., 430, 1935.—Okabe, Bull. Trop. Indus. Inst., Palau, 5:15, 1940.—Otobed, Guide List Plants Palau Is., 23, 1971.—Moore et al., Inv. Mapping Wetl. Veg. Mariana Is., 62, 217, 1977.

Verbesina alba L., Sp. Pl. 902, 1753.—Safford, Contr. U.S. Nat. Herb., 9:395, 1905.

Eclipta erecta L., Mant., 286, 1771.—Lessing, *Linnaea*, 6:153, 1831.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835.—Safford, Contr. U.S. Nat. Herb., 9:266, 1905 [nom. illegit.].

Eclipta prostrata sensu Safford, Contr. U.S. Nat. Herb., 9:266, 1905.—Stone, *Micronesica*, 1:134, 1964; *Micronesica*, 6:584, 1971 [non L., Mant., 2:286, 1771].

Erect to prostrate, somewhat square-stemmed strigose to scabrous herb, rooting in basal parts; leaves lanceolate to narrowly ovate or elliptic, obscurely to coarsely serrate, apex acute, base

decurrent to a very short petiole or sessile base, hairs on leaves more numerous beneath, tending to have enlarged pustulate bases; peduncles filiform, terminal and axillary or pseudoaxillary, 1–2 in a leaf-axil, 5–30 mm long, each bearing a single head; heads a few mm wide, tending to be flat on bottom, phyllaries ovate, herbaceous, strigose, spreading but abruptly turned upward, acute to acuminate, only 4–5 in each series, the inner smaller; receptacular bracts linear-filiform, hyaline-margined, sparsely hispid, subequal with achenes; ligules linear-oblong, white, 1.5–2 mm long, apex rounded, disk flowers white, 1.5 mm long, limb much longer than tube, cylindrical-campanulate, 4-toothed, teeth triangular; style branches short, thick, blunt, those of ray-florets glabrous, those of disk florets pubescent; achenes green until mature when they turn blackish, glabrous, obovoid-conic, apex truncate, sides very rugose, the outer ones thicker, 3-angled, convex on one side, the inner tending to be narrower and prismatic, but with 2 thick winglike keels, pappus absent or represented by 1 to several short, sharp teeth on a very short, erose callus cup on the triangular or usually diamond-shaped summit of the achene.

Probably of tropical American origin but now worldwide in distribution. In Micronesia, known from the Marianas (Saipan, Rota, Guam), Carolines (Palau, Yap, Ulithi, Woleai, Faraulap, Ifaluk, Namoluk, Kapingamarangi), Marshalls (Kwajalein, Majuro).

USES.—It is used for medicine and dye (Guam: *Barcinas 330*). Medicine for enchanted children; when lips and tongue are dry and cracked the plant is chewed or squashed and the juice put on the lips (Guam: *Evans 1744*). It is used to treat colds and dizziness (Palau: *Salsedo 414*) and in mulch as a fertilizer, as a poultice for cuts and in the process of forming a hole in the ear (Ifaluk: *Abbott and Bates 114*).

VERNACULAR NAMES.—

titimo (Rota: *Evans 2257*)

titima (Guam: Merrill, 1914; Stone, 1971)

titimo (Guam: *Whiting C15, 330*, Moore et al., 1977)

titimu (Guam: *Evans 1744*)

deberbelel a tengadik (Palau: *Salsedo 316, 414*)

habwolubwol (Ifaluk: *Abbott and Bates 114*)

The widespread *E. alba* seems separable, on the basis of habit, into two varieties corresponding to the two species of Linnaeus. Both are known from Micronesia.

Eclipta alba (L.) Hasskarl var. *alba*

Plants erect, with peduncles 1–2 cm long.

Most Micronesian specimens belong in this variety.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS.—s.l., *Haenke* in 1792 (BISH); Schumann & Lauterbach 1901:599 (citing Chamisso and Lesson).

Saipan: *Stephens 31* (Fo), Tanapag, 1 m, *Fosberg 31917* (US, BISH, Fo, NY, L).

Rota: Slope W of As Malote, S side of island, 150 m, *Fosberg 31914* (US, BISH, Fo, NY, L); planted, Songsong village, *Evans 2257* (US).

Guam: Lessing, *Linnaea* 1831:153 (citing Chamisso); Endlicher, 1835:168 (citing Chamisso and Lesson); Merrill, 1914:153; *Astrolabe* s.n. (P); *G.E.S. 30* (US, K, BISH, NY); Merizo, *Barcinas 330* (US); Agaña, near sea, 1 m, *Fosberg 35236* (US, BISH); Asan Pt., 1 m, *Anderson 27* (US, BISH, Fo, NY, L); Inarajan, *Stone 3922* (GUAM), *Moore 936* (US); Talofof River, near mouth, *Stone 4310* (GUAM); Pago Bay, *Falanruw 1352* (US); Chalan Pago, *Whiting C15* (US); Mt. Santa Rosa, 240 m, *Evans 1744* (US); beach below Bijia Pt., Tumon Bay, *Evans 1641* (US).

CAROLINE ISLANDS.—Palau: Kayangl: outside village, *Salsedo 414* (US); Babeldaob (Babelthuap): east coast at Melekeiok, *Takamatsu 1390* (BISH); Melegejoh, *Tuyama* in 1939 (TI); Lae Ngelogal, *Tuyama* in 1939 (TI). Koror: *Otobed PW-10136* (US); Ngerebe'ed, *Salsedo 316* (US).

Yap: Volkens, 1901:477 (citing Volkens 289); near Public Works, *Blackburn 252* (US).

Ulithi: Fassarai I., *Hosaka 3216* (US); Mogmog I., near marsh, 2–4 m, *Fosberg & Wong 25516* (US, BISH, Fo). Falalap I., in taro pit or marsh, 1–2 m, *Fosberg 46502A* (US).

Woleai: Falalis I., 1–2 m, *Fosberg 46999* (US); Falalop I., 5 m, *Evans 511* (US).

Faraulap: Faraulap I., *Fosberg & Evans 47364* (US).

Ifaluk: Falalap I., *Abbott & Bates 114* (US, BISH).

Namoluk: Namoluk I., *Marshall 91* (US).

Kapingamarangi: Touhou I., *Niering 729* (US).

MARSHALL ISLANDS.—Eniwetok: Enewetak I., *Lamberson* in 1976 (Mi).

Kwajalein: Kwajalein I., *Fosberg 48016* (US); around airstrip, 0–4 m, *Fosberg 48041* (US).

Majuro Atoll: Seen by Fosberg in 1978.

Eclipta alba var. *prostrata* (L.) Hassler

Eclipta alba var. *prostrata* (L.) Hassler, Trab. Mus. Farm. Fac. Cienc. Med. Buenos Aires (Contrib. Flora chaco Argent.–Paraguay 1.) 21:129, 1909.

Verbesina prostrata L., Sp. Pl. 902, 1753.

Eclipta prostrata (L.) L., Mant. 2:286, 1771.

Plants depressed or prostrate, pedicels usually less than 1 cm long.

There has been much confusion about the application of the name *Eclipta prostrata* (L.) L. with most recent authors following Fernald, Santapau, and others in regarding it as the correct name for the whole *Eclipta alba* complex. Since Hasskarl, who was the first to unite the two species, chose the epithet *alba*, however, *Eclipta alba* is the correct name for the aggregate concept. Since we recognize two varieties, the epithet *prostrata* may still be applied to the prostrate variety.

Known in Micronesia from Palau in the Carolines, and in the Marshalls (Kwajalein and Majuro).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

CAROLINE ISLANDS.—Palau: Koror: Ngerebe'ed, 10 m, *Fosberg 32487* (US, BISH).

MARSHALL ISLANDS.—Kwajalein: Kwajalein I., *Fosberg 31163* (US, BISH).

Majuro: Dalap I., near air strip, 1 m, *Fosberg 26901* (US, BISH, NY).

Elephantopus L.

Elephantopus L., Gen. Pl. ed. 5, 355, 1754 [1753].

Herbs with alternate subsessile leaves, often larger at base, usually pilose or hirsute; capitulae aggregated into secondary "heads" subtended by an "involucre" of several leaflike bracts, these terminal on peduncles, branching very loosely to form a large open panicle of upper part of plant; capitulae sessile, discoid, crowded, few-flowered, involucre of 4 decussately arranged pairs of phyllaries; receptacle naked; florets bisexual; corolla deeply 5-fid, lobes spreading; style branches long, filiform, pubescent; achenes 10-ribbed, hairy, pappus bristles straight, stiff, expanded at base into a scale.

A small genus of weedy species, of tropical to warm temperate regions; one species introduced into Micronesia, native of tropical America.

Elephantopus mollis Humboldt, Bonpland, & Kunth

Elephantopus mollis Humboldt, Bonpland, & Kunth, Nov. Gen. & Sp. Pl. 4:26 [fol. 20], 1820.—Merrill, Phil. Jour. Sci. Bot., 7:201, 1912; Phil. Jour. Sci. Bot., 9:153, 1914.—Kanehira, Enum. Micr. Pl., 430, 1935.—Walker & Rodin, Contr. U.S. Nat. Herb., 30:466, 1949.—Glassman, Bishop Mus. Bull., 209:97, 1952.—Stone, Micronesica, 6:592, 1971.—Kami et al., Univ. Guam Mar. Lab. Tech. Rept., 16:12, 1974.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:42, 1975.—Falanruw & Payne, Life of Guam, 44, 71, 1976.—Moore et al., Inv. Mapping Wetl. Veg. Mariana Is., 15, 1977.

Elephantopus scaber sensu Schumann and Lauterbach, Fl. Süds., 595, 1901.—Volkens, Bot. Jahrb., 31:477, 1901.—Safford, Contr. U.S. Nat. Herb., 9:268, 1905.—von Pro-wazek, Deutsch. Marianen, 121, 1913.—Merrill, Phil. Jour. Sci. Bot., 9:174, 1914.—Kanehira, Enum. Micr. Pl., 430, 1935.—Glassman, Bishop Mus. Bull., 209:97, 1952 [non L., Sp. Pl., 814, 1753].

Elephantopus tomentosus sensu Kitamura, Acta Phytotax. Geobot., 10(1):72, 1941.—Koster, Blumea, 1:465, 1935 [non L., Sp. Pl., 814, 1753].

Elephantopus carolinianus sensu Lessing, Linnaea, 6:104, 1831.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835 [non Willdenow, Sp. Pl., 3(3):2390, 1803].

Hirsute herb, to 2 m tall; leaves thin, elliptic, acute, or lowermost obtuse, base long-decurrent, almost or quite to base of petiole, margins crenate or serrate-crenate, often crispate, lower surfaces with very numerous minute resin globules, upper leaves becoming smaller and narrower to where they become bracts subtending the ramifications

and peduncles forming the "panicle" of "heads"; "heads" or clusters of capitula many, in alternately branched somewhat zigzag open panicles, to 0.5 m long, subtending bracts broadly ovate or cordate, acute, hirsute, strongly reticulate, capitula few to many, involucrel bracts or phyllaries broadly lanceolate, sparsely appressed pilose, scarious margined, pungent; corolla white, tube long, slender, lobes broadly linear, curled when dry; achenes narrowly turbinate, brown, strongly ribbed, antrorse-hispid, pappus scales 5, triangular, margins fimbriate, awns straight, stiff, antrorsely shortly barbellate.

Abundant aggressive weed along paths, roadsides, and in cultivated or waste ground. Native of tropical America.

In Micronesia, known from the Marianas (Asuncion, Agrigan, Pagan, Alamagan, Anatahan, Saipan, Tinian, Rota, Guam) and Carolines (Yap, Ponape).

Uses.—Used as a remedy for asthenic fever (Guam: Safford, 1905).

VERNACULAR NAMES.—

elephant foot (English)

papago (Marianas: von Prowazek, 1913)

papago (Pagan: *Anderson 572*)

papago (Alamagan: *Falanruw 1898*)

papago baka (Guam: Falanruw & Payne, 1976)

papago halen tano (Guam: *Whiting C33*)

papago halom tano (Guam: Stone, 1971; Falanruw & Payne, 1976)

papago halumtano (Guam: Moore et al., 1977)

papago vaca (Guam: *Nelson 19*, Stone 1971)

papago vaka (Guam: Moore et al., 1977)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—*Gaudichaud s.n.* (P); *Gaudichaud 137* (G).

Asuncion: Lower SW slope, 150 ft [45 m], *Falanruw 2264* (US, BISH).

Agrigan: Village, *Fosberg 31420* (US, BISH, Fo); SW coast, below 300 ft [90 m], *Falanruw 2193* (US, BISH).

Pagan: *Kanehira 2210* (FU); isthmus, *Anderson 572* (US, BISH, Fo, NY, L); near Salt Lake, W side of island, *Fosberg 31359* (US, BISH, Fo); Mt. Pagan, *Moore 384* (US).

Alamagan: SSW coast, 450 ft [140 m], *Falanruw 1898* (US).

Anatahan: NW corner of island, 200-300 ft [69-90 m], *Falanruw 1632* (US).

Saipan: *Momose* in 1930 (TI); *Kanehira 932* (FU) [cited in *Kanehira 1935:430* as *Elephantopus spicatus*].

Tinian: *Okatani 50* (FU).

Rota: Slopes above As Malote, S side of island, 250 m, *Fosberg 25091* (US, BISH); Sabana, 490 m, *Fosberg 31849* (US); above Tataacho Pt., 150-250 m, *Evans 2070* (US).

Guam: Lessing, *Linnaea 6:104*, 1831 (citing Chamisso); Endlicher, 1835:168; Merrill 1912: 145-208; Merrill, 1914:153, 154; *Exped. de l' Astrolabe 1* (G); *G.E.S. 47* (US, BISH, K, BM); *McGregor 481* (BISH); *Guerrero 704* (BISH); *Herb. Richard (P)*; *Hombroen* in 1841 (P, Fo); *Le Guillou 6* (P, Fo); S of Asan Pt., 100 m, *Anderson 46* (US); Mt. Tenjo, *Rodin 545 a* (K, US); 320 m, *Bryan s.n.* (BISH); Machanao Dist., 100 m, *Bryan 1196* (BISH); summit of Mt. Santa Rosa, 270 m, *Bryan s.n.* (BISH); Mepo, 180 m, *Bryan 1041* (US, BISH, K); Anagua, *Conover 572* (BISH); Agaña, *Safford & Seale 1091* (US); Yigo, *Whiting C33* (US); *Nelson 19* (BISH, NY); volcanic hills near Sagua River, 100 m, in savanna near Agat Dump, *Stone 4198* (GUAM, US); 1 mi [1.6 km] E of Yigo, *G.C. Moore 65* (US); ½ mi [0.8 km] E of Barrigada, *G.C. Moore 5* (US); Atantano River, *P. Moore 849* (US); valley of Talofofu River, *Stone 4448* (GUAM); Piti hills, *Swezey* in 1936 (BISH); Mt. Alutom, 700 ft [215 m] *Hosaka 3085* (US); E of Sumay, 350 m, *Fosberg 25293* (US); Umakit, *Evans 1485* (US); between Umatac and Cetti Bay, *Evans 1552* (US).

CAROLINE ISLANDS.—Yap: Volkens, 1901:477; *Koidzumi* in 1915 (TI); Kolonia, Monte Kabul, *Tuyama* in 1932 (TI); central coast to Mt. Matade, 120 m, *Cushing 444* (US); 25 m, *Cushing 445* (US); Lamer village, 15 m, *Cushing 483* (US); Tomil I., 100 ft [30 m], *Hosaka 3261* (US).

Ponape: s.l., *Ledermann 13943* (K); Colonia, *Kanehira 691* (FU); *Gantt* in 1946 (US, BISH, Fo); 2 mi [3.2 km] S of Colonia, *Glassman 2442* (US, BISH); Anapeng-pa, *Takamatsu 732* (BISH); Kiti Dist., Ronkiti, *Nakao* in 1941 (KYO); 1-15 m,

Fosberg 26407 (US); *Jokaj*, 100 ft [30 m], *Hosaka 3515* (US).

Emilia Cassini

Emilia Cassini, Bull. Soc. Philom. Paris, 68, 1817.

Weak to robust annual to perennial herbs, rarely slightly suffrutescent at base, herbage usually somewhat glaucous; leaves alternate, varying greatly from basal to upper cauline, frequently clasping at base; inflorescence 1-few-headed, usually loosely corymbosely branched or subumbeloid; heads discoid; involucre of a few (usually 8–10) linear-oblong phyllaries in one series, coherent but tending to pull apart on drying and with age, edges overlapping; receptacle convex, naked, gently rugose, florets 10 to 100 or more; corolla

very slender, with a firm, cup-shaped, somewhat dilated base, upper portion gradually, very slightly expanding upward, lobes 5, triangular to oblong-lanceolate, spreading, stamens 5, filaments very slender except the top 0.3–1.0 mm, which is firm and thickened, style-branches exerted, slightly recurved; achenes prismatic, truncate distally, with 5 angles, these with open to almost closed grooves with minute puberulence in them, sometimes with intermediate ribs, outer achenes fertile, inner sterile; pappus abundant, capillary, minutely scabridulous, caducous.

An African-Indo-Pacific genus of between 30 and 40 species, three of them widely introduced in the warmer parts of the New World and the central and western Pacific islands, two species in Micronesia.

Key to Micronesian Taxa

1. Involucre about $\frac{3}{4}$ as long as flowers, flowers usually red *Emilia fosbergii*
1. Involucre almost as long as flowers, flowers bright rose to mauve (*Emilia sonchifolia*) 2
 2. Corolla lobes usually less than 1 mm long *Emilia sonchifolia* var. *sonchifolia*
 2. Corolla lobes exceeding 1 mm long ... *Emilia sonchifolia* var. *javanica*

Emilia fosbergii Nicolson

Emilia fosbergii Nicolson, Phytologia, 32:33, 34, 1975.—Merriall & Perry, Jour. Arn. Arb., 27:325, 1946 [as *E. sonchifolia*].

Emilia javanica sensu Walker and Rodin, Contr. U.S. Nat. Herb., 30:467, 1949.—Fosberg, Occ. Pap. Bishop Mus., 23:136, 1966.—Stone, Micronesica, 6:590, 1971 [non (Burman f.) C. B. Robinson, Phil. Jour. Sci. Bot., 3:217, 1908].

Weak, subfleshy-stemmed herb, 20–60 or more cm tall, loosely branching, glabrous to usually sparsely long-pilose, leaves usually sparsely pilose, at least beneath on midrib, basal leaves tending to form a rosette, basal and lower cauline leaves ovate, more or less dentate, petiolate, blade usually strongly decurrent on petiole, middle cauline leaves oblong or oblong-lanceolate, acute, base amplexicaul-hastate, margins shallowly to deeply

dentate, upper cauline leaves and inflorescence bracts ovate to lanceolate, base amplexicaul-cordate, margins strongly to weakly dentate to entire; inflorescence very openly branched with one to few pedunculate heads on each branch, peduncles usually with a minute linear bractlet; involucre cylindrical to usually somewhat urceolate, up to about 15 × 5 mm, phyllaries about 10, coherent but separating, linear-lanceolate, white-margined, acuminate at tips, becoming reflexed; receptacle about 5 mm across; florets definitely exceeding involucre at anthesis; corolla brick red, fading dull crimson or purplish, corolla tube very slender, limb cylindrical, lobes 1.2–1.8 mm long; achene 5 mm long, prismatic, dark brown, 5-ribbed, ribs grooved, with white puberulence in grooves; pappus finely capillary, copious, white, scarcely exceeding corolla tube.

Micronesian plants are red-flowered, but in Hawaii pink, purple, and orange forms are known.

A pantropical weed, native home unknown, in Micronesia known only from Guam and Kwajalein [said to have been introduced into Guam in 1935 (Usinger, conversation).]

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Merrill and Perry, 1946:325 (as *E. sonchifolia*); s.l., *Pedrus* 29 (BISH); Agaña Height, *Glassman* 292 (Fo); Mt. Tenjo, *Rodin* 522 (US); 240 m, *Glassman* 265 (Fo); 1000 ft [305 m], *Johnson, Markeley & Necker* 75 (US, BISH); plateau between Ylig and Talofofu rivers, 100 m, *Fosberg* 25332 (US, BISH); between Ylig and Sigua valleys, 300-400 ft [90-120 m], *Steere* 58 (US); Mt. Alutom, *Hosaka* 3083 (US, BISH); 2 km N of Agat, *Necker* 62 (US); Harmon village, *Stone* 4026 (GUAM), 4027 (GUAM); Yona, *Stone* 4028 (GUAM); Merizo Annex, 90 m, *Fosberg* 43508 (US, BISH); 4 km S of Piti, 100 m, *Necker* 30 (US); 2 km S of Piti, *Necker* 181 (US); ½ mi [0.8 km] W of Agaña Bay area, *Moore* 174 (US); Mt. Santa Rosa, *Moran* 4392 (UC, BISH, Fo); Asan Pt., 1 m, *Anderson* 41a (US, BISH, Fo); S to SE of Umatac, 80-100 m, *Fosberg* 35440a (US, BISH, Fo, NY, L); NE slopes of Mt. Almagosa, 250 m, *Fosberg* 35315 (US, BISH, Fo); 2.5 km E 30° S of Sinajana, *Fosberg* 35259 (US, BISH, Fo, NY, L); near Talisay, 2.5 km, 15° S of E of Apra Heights, 150 m, *Fosberg* 35254 (US, BISH, Fo).

MARSHALL ISLANDS.—Kwajalein: Kwajalein I., *Fosberg* 31186 (US, BISH, Fo, NY, L), 48046 (US).

Majuro: Uliga I., *Fosberg* 58809 (US).

Emilia sonchifolia (L.) de Candolle

Emilia sonchifolia (L.) de Candolle in Wight, Contr. Bot. Ind., 24, 1834.—Hosokawa, Bull. Biogeogr. Soc. Jap., 7:202, 1937.—Glassman, Bishop Mus. Bull., 209:97, 1952.—Stone, Micronesica, 6:590-592, 1971.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:42, 1975. *Calacia sonchifolia* L., Sp. Pl., 835, 1753.

Weak, subglabrous to sparsely unevenly pilose, rather glaucous herbs; leaves usually deeply and irregularly pinnately lobed, terminal segments triangular, rarely broadly cordate in shaded plants, and shallowly and bluntly dentate; petioles of lower leaves narrowly winged, those of cauline leaves broad, auriculate-clasping, upper cauline leaves often sessile, oblong to lanceolate, dentate to entire, clasping; inflorescence subscape, about twice length of leaves, or longer, with 1-2 ovate-lanceolate bracts, cordate-clasping at base, sparsely corymbosely branched near top, with 3-6 or more heads; involucre narrowly cylindrical, 7-9 × 2.5-3 mm, flowers 30-60, exerted no more than about 1-1.5 mm or scarcely at all, "pale mauve"; achenes prismatic, about 2.5 mm long, 5-ribbed, the ribs grooved, the grooves puberulent.

Two varieties of this species are now recognised from the Pacific, both of which are found in Micronesia.

Emilia sonchifolia (L.) de Candolle var. *sonchifolia*

Usually slender, corolla lobes 1 mm or less long.

Originally described from Ceylon, now pantropical, difficult to know where indigenous and where introduced.

Known in Micronesia from the Marianas (Agrigan, Pagan, Alamagan, Guguan, Saipan, Tinian, Rota, Guam); Carolines (Palau, Yap, Truk, Ponape, Kusaie).

VERNACULAR NAMES.—
ngemuld (Palau: *Fosberg* 32325)
buwan (Yap: *Wong* 347)
amshiip (Truk: Hosokawa, 1937)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: Along trail around S side of island, 10-20 m, *Fosberg* 31614 (US, BISH, Fo); midwest coast, 30 ft [10 m], *Falanruw* 2316 (US).

Pagan: E of pier, *Anderson* 613 (US, BISH, Fo, NY, L); village, *Moore* 429 (US); near Salt Lake, W side of island, *Fosberg* 31369 (US).

Alamagan: SSW coast, sea level to 200 ft [60 m], *Falanruw 1958* (US).

Guguan: W coast, below 50 ft [15 m], *Falanruw 1813* (US); 200 ft [60 m], *Falanruw 1820b* (US).

Saipan: s.l., *Stephens 101* (Fo); Chalan Kanoa, 2 m, *Fosberg 31324a* (US); 50 ft [15 m], *Hosaka 3025* (US, BISH); E end of Sabanan Laulau, 1 mi [1.6 km] S of As Teo, 200 m, *Fosberg 31319* (US); S side of Kagman Peninsula, W of Kagman Pt., 30 m, *Fosberg 31297* (US); Tanapag, 1 m, *Fosberg 31280* (US); base of cliffs N of Mt. Marpi, *Fosberg 25218* (US, BISH).

Tinian: Terrace on SE coast, NE Carolinas Pt., 60–80 m, *Fosberg 24837* (US, BISH).

Rota: Above As Malote, 250 m, *Fosberg 25098* (US, BISH), *31881* (US, BISH, Fo, NY); Sabana, 490 m, *Fosberg 31850* (US).

Guam: Plateau N of Talofofu, *Hosaka 3125* (US, BISH); just S of North Field, 150 m, *Fosberg 32628* (US, BISH, Fo, NY, L); Dan Dan (Martinez Pasture), 110 m, *Fosberg 35550* (US, BISH, Fo); NE slopes of Mt. Almagosa, 250 m, *Fosberg 35316* (US, BISH, Fo); Harmon village, *Stone 4127* (GUAM).

CAROLINE ISLANDS.—Palau: s.l., *Kanehira & Nisida 22* (FU). Babeldaob: Garudokku, *Takamatsu 1265* (BISH); Garikiyai, *Takamatsu 1744* (BISH); Gakip, 150 ft [45 m], *Hosaka 3370* (US, BISH); Aimion Katelwell, *Tuyama* in 1937 (TI); Ngatpang, *Tuyama* in 1939 (TI). Koror: Ngarmid, 100 m, *Fosberg 32325* (US); Ngarabaket, *Tuyama* in 1939 (TI); *Otobed PW-10008* (US, BISH). Aulupse'el: causeway to Malakal, Ngarmalk, 1–2 m, *Fosberg 32506* (US, BISH, Fo, NY, L). Malakal I.: 15 m, *Fosberg 47589* (US, BISH, MO, K, L, NY). Angaur: 3 m, *Fosberg 31965* (US); *Momose* in 1930 (TI); N end of island, 3.4 m, *Fosberg 25966* (US, BISH).

Yap: 25 ft [8 m], *Wong 347* (US, BISH), in oppido Dogol, *Tuyama* in 1939 (TI).

Ulithi: Asor I., *Fosberg 46443* (US).

Fais: Inland from S end, 15 m, *Fosberg 46672* (US, BISH).

Truk: 25 ft [8 m], *Wong 213* (US, BISH); *Koidzumi* in 1915 (TI); *Kamiya 36* (TI). Moen (Harushima): *Takamatsu 175* (BISH); 50–100 m,

Evans 757 (US, BISH); Mt. Takeum, *Hosaka 2718* (US, BISH). Tol: Hosakawa, 1937; 202.

Ponape: Jokaj, *Takamatsu 778* (BISH); Saputik I., *Glassman 2777* (US, BISH); vicinity of Colonia, 65 ft [20 m], *Glassman 2752* (US).

Kusaie: Valley S of Lela Harbor, 1–5 m, *Fosberg 26650* (US, BISH).

Emilia sonchifolia var. *javanica* (Burman f.) Mattfeld

Emilia sonchifolia var. *javanica* (Burman f.) Mattfeld, *Nova Guinea 14* (Bot.):521, 1929.

Hieracium javanicum Burman f., *Fl. Ind. 174*, t. 57, f.1, 1768.

Emilia javanica (Burman f.) C. B. Robinson, *Phil. J. S. Bot.* 3:217, 1908 [non sensu Fosberg, *Occ. Pap. Bishop Mus.* 23:136, 1966].

Generally more robust and with somewhat broader heads than var. *sonchifolia*, corolla lobes 1.2–1.5 mm long.

Widely distributed in the South Pacific islands from Indonesia to eastern Polynesia; in Micronesia only in southern Guam, probably introduced.

MARIANAS.—Guam: Merizo Annex, 90 m, *Fosberg 43507* (US); between Umatac & Cetti Bay, 0–10 m, *Evans 1548* (US). Inarajan River 1 ½ mi [2 km] SSW of Inarajan, 15 m, *Evans 254* (US, BISH, BM, NY, G).

Epaltes Cassini

Epaltes Cassini, *Bull. Soc. Philom. Paris*, 139, 1818.

Herbs with alternate leaves; heads with involucre of several series of phyllaries, receptacle naked; flowers of two kinds, pistillate numerous in several outer series, corolla tubular, apex 3–4 dentate, style deeply bifid; inner apparently bisexual, corolla tubular-campanulate or infundibuliform, 4–5 lobed; anther tube exerted, style entire or shortly bifid; achenes obovoid, oblong or ellipsoid, angled or ribbed, pappus none; achenes of bisexual flowers empty.

A small, weedy genus found in both hemispheres; one species in Micronesia.

***Epaltes australis* Lessing**

Epaltes australis Lessing, *Linnaea* 5:148, 1830.

Small, wiry depressed somewhat pilose herb; leaves obovate or broadly spatulate, fleshy, margins strongly dentate, both surfaces beset with resin globules and deeply pitted, at least when dry, lower surface sparsely pilose, apex obtuse in general outline, base decurrent to base of petiole; heads terminal but very soon becoming lateral, at first globose but becoming broader, greenish yellow; phyllaries broad, scarious except in central area, imbricate in 4–5 series, apices acute to rounded; receptacle smooth, flat to convex; outer several series of flowers pistillate, narrowly tubular, narrowing distally, apex minutely 4-dentate; style branches exerted, blunt; inner corollas narrowly campanulate, with 4 triangular lobes; style erect shortly bifid; achenes of pistillate flowers fertile, oblong, brown, prismatic with 4 pairs of ribs, abundant resin globules on sides, apex sharply truncate with a white roughly circular disk larger than diameter of achene, those of staminate flowers similar, narrower, empty.

Native of Australia and southeastern Asia, recently introduced into Guam, known from there only from one collection, which more resembles Asiatic than Australian specimens.

MARIANAS ISLANDS.—Guam: Southern end of Cabras I., 15 m, *Evans 1673* (US).

***Erigeron* L.**

Erigeron L., *Gen. Pl.* ed. 5, 371, 1754 [1753].

Herbs rarely suffruticose; leaves alternate or basal, simple, margins entire, dentate or lobed; inflorescence scapose to paniculate; heads radiate, hemispheric; involucre with phyllaries in 2-many series, tending to be subequal or outer ones shorter, lanceolate to linear; receptacle flat, without chaff or bristles; ligulate flowers numerous, 2-many seriate, pistillate, ligules showy to inconspicuous, white to purplish, disk flowers many, hermaphrodite or outer ones pistillate, corolla tubular, 5-lobed; anthers entire at base, style branches obtuse at tips; achenes compressed, 4-angled, not beaked; pappus of barbellate bristles in 1 (rarely 2) series.

A large genus, mostly temperate or tropical montane, ill-distinguished from *Conyza* and *Aster*; one species recently introduced to Guam, another found on Guam and Angaur. Two other weedy species, commonly regarded as belonging here and common in Micronesia, formerly called *Erigeron bonariensis* L., and *Erigeron canadensis* L., are now regarded as belonging to the genus *Conyza* Lessing and are treated there.

Key to Micronesian Species of *Erigeron*

- Plants caulescent, stiff, tall, with coarse leaf rosette at base, heads in corymbiform panicles ***Erigeron annuus***
 Plants acaulescent, delicate, forming small rosettes, with filiform bracteate scapes bearing solitary heads ***Erigeron bellioides***

***Erigeron annuus* (L.) Persoon**

Erigeron annuus (L.) Persoon, *Syn.*, 2:431, 1807 [as *annuum*].

—Tuyama and Murase, *Misc. Rept. Res. Inst. Nat. Resources*, 23:1–7, 1951.—Stone, *Micronesica*, 6:576, 1971.

Aster annuus L., *Sp. Pl.*, 875, 1753.

Erect herb to 1 m tall, 1-several stems from base, stems antrorse-hispid, branching above; basal leaves forming large rosettes, spatulate, to 15 cm long, limb ovate to obovate, coarsely ser-

rate-dentate, thinly antrorsely hispid on both surfaces, petioles winged almost to base, cauline leaves sessile or almost so, lower ones linear-oblong, to 10 cm, upper ones shorter, lanceolate; branches from near summit of stem strongly ascending, further ramifying and forming an open corymbiform panicle to 15 or more cm wide; heads to 1.5 cm wide, conspicuously radiate; phyllaries linear-spatulate, pointed, scarious mar-

gined, subequal; ligules white, numerous, 5–7 mm long, disk convex, greenish, corolla-lobes acute, granulate-scabrous; achenes oblong, sparsely sericeous; pappus a crown of capillary bristles.

This is a variable species, introduced probably from Japan. The above description applies to the form introduced on Guam, which is more scapose than the common American and most of the Asiatic ones. We have not seen the material reported from Angaur by Professor Tuyama. Known in Micronesia from Guam and Angaur. It was present in Guam at least as early as 1954.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Andersen Air Force Base, *Moran 4467* (UC); Northwest Field, *Fosberg 35382* (US, BISH, Fo, NY, L); SW corner of Northwest Field, S of Ritidian Pt., 150 m, *Fosberg 39270* (US, BISH, Fo, NY).

CAROLINE ISLANDS—Palau: Angaur: Tuyama and Murase, 1951:1–7.

Erigeron bellioides de Candolle

Erigeron bellioides de Candolle, Prodr., 5:288, 1835.

Depressed herb, stoloniferous, acaulescent, leaves many, condensed into a rosette about 5 cm across, sparsely pilose, thin, spatulate with limb broadly ovate, petiole winged to base, ciliate; heads borne at the ends of decumbent to erect filiform simple or slightly branched whiplike bracteate scapes up to 10–15 cm long, scapebracts broadly obovate to subspatulate, 5–7 mm long, with rounded apices, scattered along scapes, heads on appressed pubescent peduncles 1–5 cm long, receptacle slightly convex, head about 5 mm across, phyllaries in 2 series, inner about 2 mm long, linear lanceolate, blunt, margins distally sparsely scaberulous, tending to be fimbriate at tips, outer series similar but shorter and unequal in length; ray flowers small, white, ligules short, tips recurved, lobes of disk corollas blunt, thick; achenes pale straw color, about 1 mm long, oblong, sparsely sericeous with a crown of pappus bristles about twice as long as achene.

Native of the Greater Antilles, type-locality Puerto Rico. Guam plants are more strongly pubescent than is usual for West Indian ones, but presumably within the range of variation of the species. A relatively recent introduction, as it apparently was not collected before 1965. Occurs in gardens and on roadsides, locally. It was seen well established in a lawn at Tumon by Fosberg in 1978.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Tamuning, 2 m, 1965, *Fosberg 46194* (US, BISH, Fo, MO, L, K, TI, NY, QLD); *Evans 1863* (US, BISH, Fo); Agaña Heights, *Fosberg 50557* (US, BISH, Fo, BM, GH, MO, GUAM); gate to “Glass Breakwater,” 2 m, 1976, *Herbst 5906A* (US).

Gaillardia Fougereux

Gaillardia Fougereux, Observ. Phys., 29:55, 1786 [as *Gaillarda*, sphalm.]; Mém. Acad. Sci. Paris 1786:5, t. 1, 2, 1788.—Jussieu, Gen. Pl., 189, 1789 [as *Gaillardia*, sphalm.].

Annual to perennial herbs; leaves mostly basal, cauline alternate; heads solitary, usually on long peduncles, radiate or discoid, often showy; involucre of 2–3 series of green phyllaries; receptacle hemispheric, usually setose; ray-flowers, if present, with 3-lobed or toothed ligules; disk usually globose, disk flowers hairy, fertile, usually 5-lobed, hairy at least at base; achenes obpyramidal; pappus of awn-tipped scales, these 5 or 10.

A small American genus, several species commonly planted as ornamentals and many cultivars produced by horticultural hybridization and selection. One species planted in gardens in Micronesia and locally naturalized.

Gaillardia pulchella Fougereux

Gaillardia pulchella Fougereux, Mém. Acad. Sci. Paris, 1786: 5, t.1, 2, 1788.—Guillaumin, Bull. Soc. Bot. France, 99: 22, 1952.—Catala, Atoll Res. Bull., 59:95, 1957 [as *Gaillardia*].—Stone, Micronesica, 6:582, 1971.

Pubescent herb to several dm tall; early leaves basal, the cauline narrowly oblong to oblanceolate, entire to remotely lobed, obtuse to acutish,

narrowed to a sessile base; heads 2.5–6 cm across, long-pedunculate, peduncles terminal on branches; involucre bracts foliaceous, green, white at base, apices prominently acuminate; rays narrowly obovate to cuneate, with 3 acute teeth, red or yellow, usually with yellow tips, sometimes modified funnellform, deeply lobed; disk globose, 1.5–2 cm diameter, florets blackish maroon, lobes acuminate; achenes notably hairy; pappus scales stiff, straw-colored, ascending-spreading, prominently awned.

The Micronesian plants may be the var. *picta*, if, indeed, that is distinct, or they may be horticultural hybrids or their progeny. The plants are extremely variable, especially in leaf outline and in size, form, and color of ray flowers.

In Micronesia, cultivated in the Marianas (Guam) and the Gilberts (Tarawa).

USES.—Ornamental.

VERNACULAR NAMES.—

gadyadea (Guam: *Nelson 121, 552*)

gayadea (Guam: Stone, 1971)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: *Nelson 121* (BISH), *552* (BISH); Tamuning, cult., *Fosberg 35345* (US); Agaña Heights, cult., 50 m, *Fosberg 43476* (US).

GILBERT ISLANDS.—Tarawa: Bairiki, *Catala 118* (P); cult., *Adair 146* (BISH, US); Betio, cult., *Adair 70* (BISH, US), *71* (BISH, US).

Glossogyne Cassini ex Lessing

Glossogyne Cassini ex Lessing, Syn. Gen. Comp., 212, 1832.

Small herbs, branched from base and sparingly above; leaves alternate, pinnatisect, mostly crowded in a basal rosette; heads solitary, pedunculate, phyllaries in 2 series, ray flowers pistillate, fertile; disk flowers hermaphrodite, corolla 4-toothed; style branches elongate-subulate; achenes linear, with 2–4 ascending stiff retrorsely barbed awns.

A small Indo-Australasian-western Pacific genus, very much like *Bidens* in appearance, but

perhaps differing sufficiently in its alternate leaves, 4-toothed disk corollas, and long attenuate-subulate style branches. One species widespread in the western Pacific, present on those Micronesian islands with savannas on volcanic soil.

Glossogyne tenuifolia (Labillardière) Cassini ex Lessing

Glossogyne tenuifolia (Labillardière) Cassini ex Lessing, Syn. Gen. Comp., 212, 1832.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835.—de Candolle, Prodr., 5:632, 1836.—Schumann & Lauterbach, Fl. Süds., 602, 1901.—Safford, Contr. U.S. Nat. Herb., 9:284, 1905.—von Pro-wazek, Deutsch. Marianen, 121, 1913.—Merrill, Phil. Jour. Sci. Bot., 9:154, 1914.—Schinz & Guillaumin, Nova Caled. Bot., 1(3):177–255, 1921.—Kanehira, Enum. Micr. Pl., 430, 1935.—Kitamura, Acta Phytotax. Geobot., 10: 72, 1941.—Okabe, Nankyo, 2:47, 1943.—Stone, Micronesica, 6:585, 1971.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:42–43, 1975.

Bidens tenuifolia Labillardière, Sert. Aust. Caled., 44, t. 45, 1825.—Gaudichaud, Bot. Voy. Uranie, 464, 1826 [1829].—Safford, Contr. U.S. Nat. Herb., 9:199, 1905.

Bidens meyenianus Walpers, Nov. Act. Nat. Cur., 19, Suppl., 1:271, 1843.—Volkens, Bot. Jahrb., 31:477, 1901.

Perennial herbs 1–several dm tall, 1 to a few ascending branches from a strong perennial rootstock; leaves mostly crowded at base, a few cauline at the 1–4 ramifications of the stems, blades pinnately divided, lobes several on a side, linear, mucronate, heads radiate, terminating branches; involucre campanulate, 3–5 mm high, phyllaries linear-oblong to somewhat tapering, in 2 or rarely 3 series, ascending to somewhat spreading; ray florets with ligule obovate.

A widespread Indo-Pacific species, characteristic of savannas found on most of the volcanic or partly volcanic islands in Micronesia, in the Marianas (Asuncion, Agrigan, Pagan, Guguan, Saipan, Rota, Guam) and Carolines (Palau, Yap).

USES.—The leaves and stems are squeezed and the juice expressed is applied to cuts (Yap: Okabe, 1943).

VERNACULAR NAMES.—

aornelëng (Yap: *Wong 410*)

nap (Yap: *Wong 410*)

ohl (Yap: Okabe, 1943)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Gaudichaud, 1826:464; Volkens, 1901:121.

Asuncion: SW slope, 1500 ft [460 m] *Falanruw* 2297 (US); 1000 ft [305 m], 2306 (US); 830 ft [255 m], 3065 (US).

Agrigan: *Hosokawa* 8006 (A).

Pagan: s.l., *Hosokawa* 7956 (Fo); *Kanehira* 2212 (P, NY, FU); Mt. Pagan, 1870 ft [570 m], *Moore* 374 (US); E of Fresh Water Lake, 2–50 m, *Fosberg* 31404 (US, BISH, Fo, NY, L).

Guguan: Gentle valley on W coast, 100 m, *Falanruw* 3118 (US); 200–300 ft [60–90 m], *Falanruw* 1831 (US, BISH).

Saipan: s.l., “boreali” *Okabe* in 1939 (TI); Ditzenyama Ridge, 200 m, *Fosberg* 31754 (US); E end of Sabana Laulau, 1 mi [1.6 km] S of As Teo, 200 m, *Fosberg* 31318 (US); sea cliffs on Tsukimi Bay, E of Mt. Petosukara, 75 m, *Fosberg* 25205 (US, BISH, Fo, NY); Raurau, *Hatusima* 10680 (FU).

Rota: Slopes above As Malote 250 m, *Fosberg* 25105 (US, BISH, Fo, NY, L); 31844 (US, BISH, Fo).

Guam: Endlicher, 1835:168 (citing Gaudichaud); Merrill, 1914:154; de Candolle, 1836:632; *McGregor* 406 (US, BISH); between Sigua and Ylig valleys, 300 ft [90 m], *Steere* 40 (US); headwaters, Ylig River, savanna area, *Rodin* 607 (US, BISH); Manengon, W of Tarzan Falls, upper Ylig River, *Stone* 4209 (GUAM, BISH); Mt. Tenjo, 900 ft [275 m], *Hosaka* 3424 (US, BISH, Fo, NY); 320 m, *Bryan* in 1936 (BISH); Mt. Tenjo and Mt. Reconnaissance area, 1000 ft [305 m], *Moore* 97 (US); Mt. Alutom, E of Sumay, 350 m, *Fosberg* 25282 (US, BISH, Fo, NY); slopes back of Piti, *G.E.S.* 444 (US, BISH); *Swezey* in 1936 (BISH). Sabana Magas, *Costenoble* 1190 (US); Mt. Santa Rosa, *Moran* 4389 (BISH, UC, Fo); Dan Dan (Martinez Pasture), 110 m, *Fosberg* 35545 (US, BISH, Fo, NY, L); Umatac, hill crest, 300–400 m, *Anderson* 305 (US, BISH, Fo); ridge SE of

Umatac, *Anderson* 282 (US, BISH); above Jona, 100–150 m, *Evans* 697 (US); upper Masso River valley, 1500 ft [460 m], *Grether* in 1947 (BISH); 1.5 mi [2.4 km] SSW of Inarajan along river, 50 m, *Evans* 256 (US); Cotal conservation area, 100–130 m, *Sachet* 1710 (US); Merizo Annex, 90 m, *Fosberg* 43505 (US, BISH, Fo); Bile Bay, between Merizo and Umatac, within 100 m of shore, *Necker* 47 (US); S of Asan Pt., *Anderson* 58 (US, BISH, Fo, NY, L); Commarianas Hill, *Anderson* 112 (US).

CAROLINE ISLANDS.—Palau: s.l., *Kusano* in 1915 (TI); Babeldaob: 1 mi [1.6 km] NNW of Ngere-long school, along road to Ollei, 55 m, *Canfield* 403 (US); W Babeldaob, W Ngeremlengui Munic., ridge N of Imeong, 100 m, *Canfield* 610 (US).

Yap: Volkens, 1901:477; s.l., *Kanehira* 1224 (NY, FU); *Fujikawa* in 1939 (TI); open field, 100 ft [30 m], *Wong* 410 (US, BISH, A); Kanif, *Takamatsu* 1923A (BISH), 1931a (BISH); hill SW of Gitam, *Fosberg* 46576 (US); Ins. Tomil, *Tuyama* in 1939 (TI).

***Lactuca* L.**

Lactuca L., Gen. Pl. ed. 5, 348, 1754 [1753]; Sp. Pl. 795, 1753; Bentham & Hooker, Gen. Pl., 2:524, 1873.

Glabrous, usually lactiferous herbs, leaves basal and/or alternate, usually glabrous, rarely hispid, heads radiate, paniculate; involucre cylindrical, usually narrow, phyllaries in few series, inner erect, subequal, the outer gradually shorter to very short, receptacle plane, naked; flowers all ligulate, ligules pale yellow or blue, 5-dentate at apex; achenes oval-oblong to narrow, more or less compressed, often flat, apex usually long-beaked, rarely very shortly so, faces 3–5 costate; pappus copious, capillary.

A large mostly Northern Hemisphere genus but with a few African and several tropical species, at least 2 introduced into Micronesia.

Key to Species of *Lactuca* in Micronesia

- Basal leaves obovate to orbicular, not notably lobed, achenes strongly beaked ***Lactuca sativa***
 Basal leaves strongly lobed, achenes scarcely beaked ***Lactuca intybacea***

Lactuca intybacea Jacquin

Lactuca intybacea Jacquin in Murray, Syst. Veg. ed. 14, 1:713, 1784.

Launaea intybacea (Jacquin) Beauverd, Bull. Soc. Bot. Genève II, 2:114, 1910.

Plant 1.3 m tall, leafy to about halfway up, with a rosette at base; basal leaves 12 × 25 cm, decreasing upward, oblong in general outline, deeply lobed, 4–5 pairs of triangular lobes pointing somewhat backward, terminal lobe on lower leaves obtuse, becoming acuminate above, margins irregularly glandular-denticulate, blade sessile, strongly auriculate, the auricles more or less lacerate; upper part of stem bare, paniculate, tiny aristate bracts subtending branchlets; heads narrow, 12–15 mm long; outer involucre bracts imbricate in several series of varying lengths, the inner 4–8 at least twice the length of longest outer ones, blunt and slightly lacinate at apex, purple with narrow white margin; flowers yellowish white, corollas exceeding involucre by about 5 mm; achenes gray or yellowish gray, about 3–5 mm long, somewhat swollen, roughly square in cross section, 4 strong ribs with 2 subsidiary ones in each interval, ribs muricate papillate, narrowed above to a short beak about 1 mm or less long; pappus white, capillary, abundant, 7–8 mm long, in 2 indistinct series.

MARIANAS ISLANDS.—Guam, Mangilao, *Stone 4733* (BISH, GUAM).

Lactuca sativa L.

Lactuca sativa L., Sp. Pl., 795, 1753.—Safford, Contr. U.S. Nat. Herb., 9:281, 304, 1905.—Merrill, Phil. Jour. Sci. Bot., 9:154, 1914.—Fosberg, Atoll Res. Bull., 67:19, 1959.—Fosberg & Sacht, Atoll Res. Bull. 123:15, 1969.—Stone, Micronesica, 6:577, 1971.

Erect glabrous lactiferous herb to 1 m tall; basal leaves large, numerous, obovate to orbicular, forming an often rather curly rosette or compacted into a head, stem leaves smaller, auriculate serrate; heads erect, yellow, 12–16 flowered; achenes oblong but somewhat broader above, with a slender beak.

First reported from Guam in 1905, it is occasionally cultivated and sometimes escapes. It was

observed in cultivation on Wake Island in 1939 and 1952 (Fosberg, 1959:19), but not in 1961 or 1963 (Fosberg and Sacht, 1969:15). In the Marshalls it is cultivated on Kwajalein.

USES.—Japanese varieties cooked as pot herbs (Guam: Safford, 1905). Fresh leaves commonly used as salads.

VERNACULAR NAMES.—

lettuce (English)

lechuga (Spanish)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Safford, 1905: 304; Merrill, 1914:154; Tamuning, planted, *Evans 1864* (US).

WAKE ISLAND.—Fosberg, 1959:19.

MARSHALL ISLANDS.—Kwajalein: Fosberg, sight record, growing in sheltered garden, 1956.

Mikania Willdenow

Mikania Willdenow, Sp. Pl., 3:1742, 1803 [nom. cons.].

Herbs, shrubs, or usually twining vines; leaves opposite, usually simple, often broadly cordate or hastate; heads paniculate, discoid, narrow, 4-flowered, involucre of 4 nearly equal bracts; often with prominent 5th subinvolucre bract; flowers white, corolla tube narrow, limb funnel-form, broad, 5-lobed; achenes 5-angled, with copious capillary pappus bristles.

A large mostly American genus with one or two widely dispersed species, one recently introduced on Guam.

Mikania scandens (L.) Willdenow

Mikania scandens (L.) Willdenow, Sp. Pl., 3:1743, 1803.—Stone, Micronesica, 6:581–582, 1971.—Randall, Tsuda, et al., Univ. Guam Mar. Lab. Tech. Rept., 12:55, 1974.—Kami et al., Univ. Guam Mar. Lab. Tech. Rept., 16:12, 1974.—Moore et al., Inv. Mapping Wetl. Veg. Mariana Is., 15, 76, 94, 1977.

Eupatorium scandens L., Sp. Pl., 836, 1753.

Mikania micrantha Humboldt, Bonpland, and Kunth, Nov. Gen. et Sp., 4:105, 1820.

Extensive twining herbaceous vine, all parts with minute scattered resin globules, stems sparsely pilose especially near nodes; leaves thin,

about 6–10 × 5–6 cm, cordate subhastate, long acuminate, margins obscurely to clearly sinuate or sinuate-dentate, with 3 principal nerves, the nerves marginal from base to a few mm up, 2 lesser nerves spreading from margin beyond, all lateral ones arching upward and anastomosing to form a coarse network, blade glabrous to subglabrous or very sparsely short-pilose below, petiole slender, subequal with or exceeding blade; heads in rather loose thyrsoidally subumbellate panicles, these glabrous, ramified 3 times, branches and peduncles filiform; heads narrowly campanulate, 4–5 mm long, florets white, exceeding involucre, phyllaries green, with hyaline margins, narrowly obovate, with an ovate-acute or acuminate apical part, this hyaline and ciliolate, 1 outer phyllary or bract much shorter, almost entirely green, 2 innermost ones broader, hyaline or only central part somewhat greenish; corolla limb campanulate-funnelform, lobes ovate, acute; tending to be either recurved or inrolled; anther tube dull tan to brownish, with 5 pale ovate-lanceolate, obtuse hyaline appendages; style branches cream color, turning brownish, puberulent; achenes dark brown, glabrous or angles hispidulous, prismatic, angles with white filiform keels, intervals with scattered clear resin globules; pappus white, turning light brownish, subequal with corolla, bristles antrorsely hispidulous.

Mikania scandens L. is here adopted in an extremely broad sense. Several of the specimens from Guam have been determined by W.C. Holmes as *Mikania micrantha* H.B.K., a name generally used for the widespread weedy Neotropical species, and which we have earlier used on herbarium sheets for the Micronesia introduction. We have compared the Guam material with an extensive series of *Mikania scandens* from the eastern United States and of material named *Mikania micrantha* by Holmes from tropical America and from Melanesia and Samoa. These "species" are both variable, the "*micrantha*" perhaps more so. The Guam material seems in most characters quite within both ranges of variation, perhaps more like the eastern United States material than

the Melanesian, though admittedly this is only an impression. There is said to be a difference in cell size that may be responsible for the tendency toward recurved corolla lobes in "*micrantha*." We see little to be gained by recognizing species based on such tenuous grounds and prefer to admit a reasonable amount of variability. Hence we, for the time being, call the Marianas plant *Mikania scandens* L.

A widespread tropical plant of American origin, introduced on Guam during or after World War II, and now abundant there and recently spread also to Rota, Tinian, and Saipan. We have not seen specimens from the latter two islands but record it on the authority of Mr. Philip Moore.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: Moore et al., 1977:94.

Tinian: Moore et al., 1977:76, 80.

Rota: Sabana Road, SW of airport, Fosberg & Moore 58217 (US, BISH).

Guam: Above Jona, 100–150 m, Evans 705 (US); 2–3 km NW of Yona, 100–130 m, Fosberg 35293 (US, BISH, FO, NY, L); Agaña Springs, P. Moore 804 (US); Talofof River area, Pedrus 22 (GUAM); Cabras I., along Piti channel, 0–3 m, Evans 1445 (US); Y-Piga Conservation area, 160 m, Fosberg 43431 (US, BISH, FO, NY, L); Naval Magazine, Almagosa, Stone 4903 (GUAM).

Pluchea Cassini

Pluchea Cassini, Bull. Soc. Philom. Paris, 31, 1817.

Resinous shrubs or herbs; leaves alternate, simple; heads discoid, in flat-topped or rounded panicles; involucre bracts imbricate, in several series; flowers pinkish or purplish, rarely whitish, a number of outer rows pistillate, with filiform corolla, at apex truncate to minutely denticulate or 3-fid, functionally staminate flowers few, central, throat dilated, limb 5-lobed, anthers tailed at base; style unbranched or bifid; achenes 4–5 angled, grooved; pappus setose, in one series, free or connate at base.

A small genus of tropical to warm-temperate regions; two species introduced into Micronesia, with a naturally occurring sterile hybrid between them.

Key to Species of *Pluchea* in Micronesia

1. Panicles hemispheric, leaves almost glabrous, involucre narrow, cylindrical to campanulate *Pluchea indica*
1. Panicles flat-topped, leaves pubescent, involucre hemispheric 2
 2. Plant upright, leaves gray, not or slightly dentate, achenes dark brown *Pluchea symphytifolia*
 2. Plant depressed, at least around edges, leaves green, somewhat dentate, achenes pale *Pluchea* × *fosbergii*

Pluchea × *fosbergii* Cooperrider and Galang

Pluchea × *fosbergii* Cooperrider and Galang, Amer. Jour. Bot. 52:1025, 1965.—Stone, Micronesica, 6:589–590, 1971.

Depressed shrub, sometimes a meter high in center but peripherally tending to be prostrate, intermediate between *Pluchea indica* and *Pluchea symphytifolia* in pubescence and leaf shape and size of heads, leaves usually more like those of *P. indica* but mostly less dentate, inflorescences more like those of *P. symphytifolia*, style branches longer than those of either parent, achenes narrower, paler than those of either parent, always sterile, pappus more like that of *P. symphytifolia*, but whiter.

Found always in company with the other two species, and shown in the original publication to be a spontaneous hybrid between the two.

Described from Hawaiian Islands but found in Micronesia, as well as on other central Pacific islands.

In Micronesia, it is known from Guam in the Marianas, Kwajalein in the Marshalls, and Butaritari in the Gilberts.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Sasa River, Moore 882 (US); breakwater beyond Cabras I., Fosberg 43409 (US, BISH, Fo, NY, L).

MARSHALL ISLANDS.—Kwajalein: Kwajalein I., near airstrip, Fosberg 39493 (US, BISH).

GILBERT ISLANDS.—Butaritari: Butaritari I., Herbst & Allerton 2724 (US).

Pluchea indica (L.) Lessing

Pluchea indica (L.) Lessing, Linnaea, 6:150, 1831.—Guillamin, Bull. Soc. Bot. France, 99:22, 1952 [as *P. purpurascens*].—Catala, Atoll Res. Bull., 59:103, 1957.—Otobed, Guide List Plants Palau Is., 23, 1971.—Stone, Micronesica, 6:589, 1971.—Moore et al., Inv. Mapping Wetl. Veg. Mariana Is., 15, 86, 1977.

Baccharis indica L., Sp. Pl., 861, 1753.

Upright shrub, rather bushy, to 1–1.5 (–2) m tall, sparsely puberulent or tomentulose, especially younger parts, green; leaves obovate, 2.5–4 (–5) × 1.2–2.0 cm, thickish, apex obtuse, base cuneate, margin dentate, entire toward base, venation rather obscure, petiole almost none to 5 mm; heads in hemispherical panicles, many, pink or purplish pink; involucre narrow and cylindrical when living, campanulate when dry, to about 5 mm long, involucre of many spirally imbricated green phyllaries, basal ones ovate, obtuse, about 1 mm long, ciliolate, narrower and much longer upward, the inner ones scarious with a twisted tail-like caducous appendage; achenes minute, about 1 mm long, prismatic, ribbed, dull brown, glabrous, or with a few white hairs near apex; pappus a single ring of about 15–16 spreading curved fine bristles about 2.5 times as long as the achene.

A species from south Asia, widely introduced in the tropics usually in saline places; probably introduced into Micronesia during World War II.

In Micronesia, known from the Marianas (Saipan, Guam), Carolines (Palau, Ulithi), Marshalls

(Eniwetok, Kwajalein, Majuro), Gilberts (Butaritari).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: Capitol Hill to Jefferson Beach, 5–50 m, *Evans 2313* (US, BISH, Fo, NY); Tanapag, 1 m, *Fosberg 31279* (US, BISH).

Guam: Edge of cliff above Uruno Pt., *R. Moran 4527* (UC, BISH, Fo); Atantano River, *Moore 857* (US); Harmon village, *Stone 4033* (GUAM); Cabras I., 0–20 m, *Evans 1443* (US), *1671* (US); breakwater just beyond Cabras I., *Fosberg 43411* (US, BISH, Fo).

CAROLINE ISLANDS.—Palau: Peliliu, *Emmons 94* (US, BISH); Atalokul, 2 m, *Fosberg 47618* (US, BISH); around N landing, 1–2 m, *Fosberg 31951* (US).

MARSHALL ISLANDS.—Eniwetok, *Lamberson* in 1975 (Mi).

BANABA (OCEAN) ISLAND?

GILBERT ISLANDS.—Butaritari: Butaritari I., *Catala 61* (P); *Herbst & Allerton 2764* (US).

Pluchea symphytifolia (Miller) Gillis

Pluchea symphytifolia (Miller) Gillis, *Taxon*, 26:588, 1977.

Conyza symphytifolia Miller, *Gard. Dict.* ed. 8, 1768.

Pluchea odorata sensu Guillaumin, *Bull. Soc. Bot. France*, 99: 22, 1952.—*Catala*, *Atoll Res. Bull.*, 59:103, 1957.—*Fosberg*, *Atoll Res. Bull.* 67:19, 1959.—*Fosberg & Sachet*, *Atoll Res. Bull.*, 123:15, 1969.—*Stone*, *Micronesica*, 6:589, 1971. [Non (L.) Cassini, *Dict. Sci. Nat.*, 42:3, 1826.]

Pluchea carolinensis sensu Moore et al., *Inv. Mapping Wetl. Veg. Mariana Is.*, 34, 1977 [non (Jacquin) G. Don in *Sweet, Hort. Brit.* ed. 3, 350, 1839].

Tall aromatic shrub, 1–3 (–4) m, notably grayish pubescent; leaves elliptic to narrowly ovate, 5–15 × 2–4 (–5) cm, apex usually acute, or obtuse, base acutely narrowed to a rather short petiole, blade thick-chartaceous, sparsely tomentose on upper surface, densely so beneath, margin subtire to rarely somewhat dentate, venation visible beneath; heads in large flat-topped clusters grayish purple, dusty looking; involucre hemispheric, bracts in several series, spirally imbricated, outer ones broadly elliptic, grayish pubes-

cent, obtuse, inner scarious and lanceolate or linear-lanceolate, acuminate; achenes about 0.8 mm prismatic to slightly ellipsoidal, dark brown, scarcely ribbed, sparsely appressed white pubescent; pappus dull brownish white, one series of 10–12 bristles several times as long as achenes.

A Caribbean species widely introduced in the tropics, very weedy and with wide ecological amplitude and range of habitats; introduced into Micronesia, probably from Hawaii during or immediately after World War II.

In Micronesia, it is known from the Marianas (Tinian, Guam), Carolines (Palau), Wake Is., Marshalls (Eniwetok, Kwajalein, Majuro), Gilberts (Butaritari, Tarawa). It is said to have been introduced into Tarawa by the American troops, who called it “carray plant” (*Catala*, 1957:103).

VERNACULAR NAME.—Curray plant (English)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: Garapan, 2 m, *Fosberg 31781* (US, BISH, Fo, NY, L).

Tinian: N field, *Kondo & Jenkins 13* (BISH); *Kondo 30* (BISH).

Guam: Ritidian Pt., 400 ft [120 m], *Hosaka 3117* (US, BISH); Uruno Pt., edge of cliff, *Moran 4527a* (BISH, UC, Fo); Harmon village, *Stone 4032* (GUAM); breakwater just beyond Cabras I., 4 m, *Fosberg 43410* (US); N end of Cabras I., 15 m, *Evans 1676* (US).

CAROLINE ISLANDS.—Palau: Peliliu: near airstrip, 6 m, *Fosberg 32015* (US, BISH); 2–4 m, *Fosberg 47636* (US).

WAKE ISLAND.—*Krauss* in 1957 (BISH); *Fosberg 34447* (US); around Pan American terminal, *Fosberg 33621* (US); area A near runway, *Gaston* in 1953 (BISH).

MARSHALL ISLANDS.—Eniwetok: Engebi I., *Fosberg 24405* (US, BISH); Eniwetok I., *St. John 23703* (US, BISH).

Kwajalein: Kwajalein I., *Fosberg 31170* (US, BISH, Fo, NY, L), *Fosberg 39492* (US); Ebeye I., *Fosberg 31208* (US, BISH, Fo).

Majuro: Darrit I., *Fosberg 31195* (US, BISH, Fo, NY, L); Dalap I., *Stone 1123* (BISH, US).

GILBERT ISLANDS.—Tarawa: Bikenibeu I., *Catala* 22 (P); *Herbst & Allerton* 2658 (BISH); *Sachet* 1433 (US); Betio, *Adair* 186 (US).

Butaritari: Butaritari I., *Herbst & Allerton* 2704 (US).

***Pseudo-Elephantopus* Rohr**

Pseudo-Elephantopus Rohr, *Skrivter Naturh. Selsk. Kobenh.*, 2:214–216, 1792.

Distreptus Cassini, *Bull. Soc. Philom.*, 66, 1817.

Tough, wiry herbs with alternate leaves, the largest forming a basal rosette; capitula forming dense small sessile clusters in axils of bracts on a terminal spicate usually unbranched inflorescence; each head discoid, with 4 florets, involucre narrow, of 4 pairs of subdecussate phyllaries, outer much shorter than inner; corollas deeply 5-fid, lobes spreading; style-branches long, filiform, pubescent; achene 10-ribbed; pappus of several unequal awns, the 2 longest curved sharply downward near middle, then back upward.

A weedy pantropical genus, native of tropical America, of one widespread species and possibly other local American ones, the widespread one naturalized in the Marianas.

***Pseudo-Elephantopus spicatus* (B. Jussieu) Vahl**

Pseudo-Elephantopus spicatus (B. Jussieu) Vahl in Rohr, *Skr. Selsk. Kobenh.* 2:216, 1792.—Koster, *Blumea*, 1:467, 1935 [as *Pseudelephantopus*].—Kitamura, *Act. Phytotax. Geobot.*, 10:72, 1941.—Stone, *Micronesica*, 6:593, 1971 [as *Pseudelephantopus*].—Fosberg, *Falanruw*, & Sachet, *Smithsonian Contr. Bot.*, 22:43, 1975 [as *Pseudelephantopus*].

Elephantopus spicatus B. Jussieu in Aublet, *Pl. Guian.*, 2:808, 1775.—Schumann and Lauterbach, *Fl. Süds.*, 595, 1901.—Safford, *Contr. U.S. Nat. Herb.*, 9:268, 1905.—Merrill, *Sp. Blancoanae*, 376, 1905; *Phil. Jour. Sci. Bot.*, 9:154, 1914.

Distreptus spicatus Cassini, *Dict. Sci. Nat.*, 13:367, 1819.—Endlicher, *Ann. Wien. Mus. Naturgesch.*, 1:168, 1835.—Safford, *Contr. U.S. Nat. Herb.*, 9:263, 1905.

Wiry, very deep-rooted herbs, stems striate-ribbed, sparingly long-hirsute-pilose, to 0.5 m or more tall, usually smaller; leaves obovate to elliptic, sparsely hirsute, abundantly resin-dotted beneath, rather congested near base, a few cauline

ones smaller upward, changing to bracts in the simple or branched spiciform inflorescence; these bracts hirsute-ciliate, reduced upward, subtending 1 or more capitula, those narrowly ellipsoidal, strongly ascending or appressed to rachis; phyllaries ovate or ovate-lanceolate, rigid, sharply cuspidate, pale straw-colored with two green areas in upper part, these resin-dotted, sparsely strigose, setose near apex, midrib white, very strong; corolla whitish to pale pink or lavender, funnellform with narrow lobes; achenes very narrowly turbinate, strongly ribbed, brownish, antrorse-hispid, pappus of about 6 ovate-lanceolate stiff scales, margins hispid ciliate, ending in stiff strong awns, unequal, the 2 longest with a double sharp curve near top.

Leaves on juvenile or basal shoots broader, subhastately lobed at base.

Very common weed in pastures, cultivated ground, trailsides and roadsides.

In Micronesia, known only from the Marianas (Agrigan, Saipan, and Guam). According to Merrill (1905:376) it was introduced into Guam on Spanish galleons from Mexico.

VERNACULAR NAME.—Papago (Guam: *Nelson* 94, Stone, 1971)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—s.l., *Gaudichaud s.n.* (P).

Agrigan: Trail around S side of island, 10–20 m, *Fosberg* 31595 (US); SW coast, below 300 ft [90 m], *Falanruw* 2165 (US).

Saipan: *Kanehira & Hatusima* 4303 (FU).

Guam: Endlicher, 1835:168 (citing Chamisso and Lesson); Merrill, 1914:154; *Nelson* 94 (BISH); *G.E.S.* 111 (US, BISH, NY, K); *Astrolabe* 3 (G), 44 (P); *Hombroen* in 1841 (P, Fo); *Marche* 164 (P, Fo); Talofofu River valley, 1 mi [1.6 km] above mouth, 1–2 m, *Fosberg* 31259 (US, BISH, Fo, NY, L); Cella Bay, *Cushing & Falanruw* 719 (US); between Umatac and Cetti Bay, *Evans* 1545 (US).

***Pseudogynoxys* (Greenman) Cabrera**

Pseudogynoxys (Greenman) Cabrera, *Brittonia*, 7:54, 1950.—Robinson & Cuatrecasas, *Phytologia* 36:177–192, 1977.

Senecio L., Gen. Pl. ed. 5, 373, 1754 [in small part].
Senecio subgenus *Pseudogynoxys* Greenman, Bot. Jahrb., 32:19,
 1902 [as *Pseudogynoxis*].

Vines, twining or clambering, herbaceous to suffrutescent; leaves alternate, thin, ovate to broadly ovate or oblong-ovate, acute to somewhat acuminate, base obtuse or broadly acute to cordate, margin serrulate to coarsely dentate or somewhat lobed or hastate at base, petiole long, rather slender; heads 1 or few to many, in terminal or axillary, umbelloid or corymbiform, rounded or flat-topped clusters; heads radiate, campanulate to hemispheric, subtended by a calyx of many bracts, involucre proper of a single whorl of linear attenuate bracts; receptacle glabrous; corollas glabrous, disk corollas deeply 5-lobed, orange, rays orange to red, linear or lanceolate, 3-toothed at apex; anthers narrowed or slightly cordate at base, appendages lanceolate; style branches spreading to recurved, apices acute to acuminate, pubescent; achenes cylindrical, with 10 ribs; pappus copious, of capillary scabridulous bristles.

A small tropical American genus with one widely cultivated species, which is occasionally planted in Micronesia.

***Pseudogynoxys chenopodioides* (Humboldt,
 Bonpland, & Kunth) Cabrera**

Pseudogynoxys chenopodioides (Humboldt, Bonpland, & Kunth)
 Cabrera, Brittonia, 7:54, 1950.—Robinson & Cuatrecasas,
 Phytologia, 36:185, 1977.
Senecio chenopodioides Humboldt, Bonpland, & Kunth, Nov.
 Gen. & Sp., 4:140 [fol. ed.], 1818.
Senecio confusus Britten, Jour. Bot., 36:260, 1898.

Much-branched twining vine, stems suffrutescent below, striate, sparsely puberulent, branches tending to be supra-axillary; leaves broadly ovate, coarsely dentate, sometimes hastately lobed, base obtuse to cordate, apex somewhat acuminate, blade subglabrous, petiole striate, very sparsely pilosulous; inflorescences of rather few long pedunculate, corymbosely arranged heads, peduncles puberulent; calyx of rather few linear-filiform, sparsely puberulent bracts, involucral bracts lanceolate, green with pale margin, dorsally very sparsely puberulent in lines or stripes,

acuminate with purple densely puberulent tips; rays bright orange, turning red, tips on drying shriveling in a tightly crisped fashion, disk corollas narrowly funnelliform; style branches flattened, acuminate, yellow turning dull reddish or purplish; achenes cylindrical, about 10-ribbed, strongly hirtellous or hispidulous; pappus copious, of capillary white bristles in several series.

Cultivated in Guam.

MARIANAS ISLANDS.—Guam: Agaña, cult., *Stone 4377* (GUAM, US); Agaña Heights, 50 m, cult., *Fosberg 43474* (US).

***Sonchus* L.**

Sonchus L., Gen. Pl. ed. 5, 347, 1754 [1753].

Annual or perennial lactiferous herbs, somewhat glaucous; leaves basal and cauline, alternate, simple; heads radiate, solitary on long peduncles or corymbose or umbelloid; receptacle fleshy, more or less swollen; involucre of several series of imbricated unequal phyllaries; florets all ligulate, yellow, bisexual; achenes not beaked, more or less flattened; pappus copious, of fine capillary white bristles, cohering at base.

A small Old World genus with several weedy species, which have become very widespread, one very common in Micronesia.

***Sonchus oleraceus* L.**

Sonchus oleraceus L., Sp. Pl., 794, 1753.—Merrill & Perry,
 Jour. Arn. Arb., 27:325, 1946.—Fosberg, Atoll Res. Bull.,
 67:19, 1959.—Sakagami, Pac. Sci. 15:85, 1961.—Fosberg
 & Sachet, Atoll Res. Bull., 123:15, 1969.—Stone, Micro-
 nesica, 6:578, 1971.

Erect, annual glabrous herb, stems commonly rather soft, to 0.6–0.7 m tall; basal leaves forming a rosette, deeply pinnately lobed, the lobes rarely somewhat lobed, margins softly spinulose-dentate, terminal segment triangular, large petioles winged, broadened at base, cauline leaves less deeply lobed, runcinate, or only toothed, with a large triangular or triangular hastate terminal segment, basal part broadly winged, sessile, clasping, basal auricles acute or acuminate, margins sharply or spinulosely dentate; heads rather few, in irregularly cymose corymbiform panicles; flow-

ers pale yellow; achenes light brown, somewhat compressed but not winged, with several ribs, closely cross-rugulose.

A practically cosmopolitan weed, common but not abundant in part of Micronesia, found mostly in disturbed, more or less open places. Curiously, it seems to be absent, or at least unrecorded, from the Carolines, Gilberts, and Nauru. The record from Ponape, based on *Glassman 2581* (US), is *Crassocephalum crepidioides*.

It is known from the Marianas (Guam), Wake Island, Marshalls (Kwajalein, Majuro, Arno).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: Merrill & Perry, 1946:325; W foot of Mt. Tenjo, 1000 ft [305 m], *Moore 236* (US); base of W slope of Mt. Tenjo, *Glassman 239* (Fo).

MARCUS ISLAND.—Sakagami, 1961:85 (quoting T. Tuyama).

WAKE ISLAND.—Area A, boat landing, *Gaston* in 1953 (BISH); *Fosberg 34464* (US), *34483* (US).

MARSHALL ISLANDS.—Kwajalein: Kwajalein I., *Fosberg 31164* (US).

Majuro: Dalap I., *Fosberg 26903* (US, BISH,

Fo).

Arno: *Anderson s.n.* (US), *3772* (US).

Spilanthes Jacquin

Spilanthes Jacquin, Enum. Pl. Carib., 8, 1760.

Small, erect or ascending, sparsely diffusely branched herbs; leaves opposite, simple; heads solitary on long peduncles, these terminal or in upper axils, radiate (ours) or discoid only, rays usually yellow; involucre flat, of 1–3 series of oblong fimbriate-margined phyllaries; receptacle conical or columnar, bracteate; ray flowers, when present, pistillate, disk flowers bisexual; rays oblong or elliptic, 2–3 toothed, disk flowers tubular with a campanulate 3–5 toothed limb, enclosed by the folded, carinate, bilobed receptacular bracts; anthers weakly connate, obtuse at base, acute at apex; style branches short, truncate; achenes oblong, black, marginal ones trigonous, disk achenes laterally compressed, pappus absent or of 1–2(-3) short awns.

A medium-sized pantropical weedy genus; 2 species in Micronesia, 1, at least, probably both, introduced.

Key to Species of *Spilanthes* in Micronesia

- Heads with involucre of 15–20 phyllaries in 3 series, rays 5–15, ligule oblong, 5–13 mm long *Spilanthes grandiflora*
 Heads with 5–7 phyllaries in 1 series, rays about 5, inconspicuous, 1–3 mm long *Spilanthes iabadicensis*

Spilanthes grandiflora Turczaninow

Spilanthes grandiflora Turczaninow, Bull. Soc. Imp. Nat. Mosc., 24:185, 1851.—Hosokawa, Trans. Nat. Hist. Soc. Formosa 28:157, 1938.

Glabrous herb, where depressed rooting at nodes; leaves ovate to lanceolate, petiolate, margins of blade sinuate-dentate or remotely dentate; heads with 15–20 lanceolate phyllaries in 3 series, apices obtuse; rays much exceeding involucre, to 13 mm long, disk hemispheric, becoming ovoid, to as much as 17 mm long, disk corollas funnel-form, 2 mm long; achenes 2.0–2.5 mm long, margins ciliate; pappus bristles 2 or usually lacking (description compiled from literature.)

Native to the Philippines, New Guinea, and Australia, it is known from one record from Palau in Micronesia.

CAROLINE ISLANDS.—Palau: Hosokawa ms. (citing Hosokawa 9128-a); Koror: On field of Agricultural Experimental Station, Hosokawa 1938: 157 (citing collector unknown, no. 64, 1937).

Spilanthes iabadicensis A. H. Moore

Spilanthes iabadicensis A. H. Moore, Proc. Amer. Acad., 42: 542, 1907.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.

Spilanthes acmella sensu auct. plur.—Kitamura, Act. Phyt. Geobot., 10:72, 1941 [non (L.) Murray, Syst. Veg. ed. 13, 610, 1774].

Spilanthes paniculata sensu Glassman, Bishop Mus. Bull., 209: 97-98, 1952 [non Wallich in de Candolle, Prodr., 5:625, 1836].

Decumbent to erect herb, to 1 m tall, rooting at nodes when decumbent; leaves elliptic to ovate, to 8 cm long, obtuse to subacute, glabrous, petiolate; peduncles slender, 1-12 cm long, terminal or usually in upper axils or occasionally pseudoaxillary; heads fairly numerous, small, to 5 mm long, elongating in age to 10 mm, globose to ovoid or conic; rays about 5, not greatly exceeding the involucre, 1-3 mm long, elliptic or ovate, disk florets very small, about 1 mm long; achenes 1-1.5 mm long, margins ciliate or not; pappus bristles 1-2.

Known in Micronesia from the Carolines (Ponape) and the Marshalls (Jaluit).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

CAROLINE ISLANDS.—Ponape: *Hatusima 10952* (FU); Anapang-pa, *Takamatsu 766* (BISH, Fo); Auak, roadside ditch, *Glassman 2906* (US, BISH); 1 mi S of Panpinshap, 2 mi SE of Kolonia, *Fosberg 58508* (US, BISH).

MARSHALL ISLANDS.—Jaluit: Mackenzie sight record (cited by Fosberg and Sachet 1962:37).

Synedrella Gaertner

Synedrella Gaertner, Fruct. 2:456, t. 171, 1791 [nom. cons.].

Herbs with opposite branches and leaves, said to be annual; heads radiate, terminal and axillary, shortly pedunculate or the axillary ones mostly sessile, few-flowered; ray florets pistillate, disk florets bisexual; involucre narrow, of few phyllaries, outer two foliaceous, inner stramineous, stiff, receptacular bracts similar, phyllaries and receptacular bracts all subtending florets; ray florets with short, broad yellow ligules, 2-4 dentate at apex; marginal achenes dorsiventrally compressed, oblong, margins with broad lacinate or toothed wings, 2 strong spines at apex, disk achenes narrower, linear-oblong or narrowly cuneate, subtrigonal, with 2-3 spine-like awns at summit.

A rather small pantropical, especially African, genus with one ubiquitous weedy species, very common in Micronesia.

Synedrella nodiflora (L.) Gaertner

Synedrella nodiflora (L.) Gaertner, Fruct., 2:456, 1791.—Volken, Bot. Jahrb., 31:477, 1901; Notizbl., 4:91, 1903.—Safford, Contr. U.S. Nat. Herb., 9:380, 1905.—Merrill, Phil. Jour. Sci. Bot., 9:154, 1914.—Koidzumi, Bot. Mag. Tokyo, 29:255, 1915.—Kanehira, Enum. Micr. Pl. 430, 1935.—Hosokawa, Bull. Biogeogr. Soc. Japan, 7:202, 1937.—Okabe, Jour. Anthropol. Soc. Nippon, 56:271, 1914.—Kitamura, Act. Phyt. Geobot. 10:72, 1941.—Glassman, Bishop Mus. Bull., 209:98, 1952.—Guillaumin, Bull. Soc. Bot. France, 99:22, 1952.—Catala, Atoll Res. Bull., 59:108, 1957.—Takeuchi, Handb. Marshall Pl. Names: 5, 1959.—Stone, Pac. Sci., 13:104, 1959.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.—Otobed, Guide List Plants Palau Is., 23, 1971.—Stone, Micronesica, 6: 585, 1971.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot. 22:43, 1975.

Verbesina nodiflora L., Cent. Pl., 1:28, 1755—Safford, Contr. U.S. Nat. Herb., 9:396, 1905.

Erect herb, stems lightly strigose, terminating after 4-6 (-8-10) nodes in 1 or even 2 shortly pedunculate heads, 1 or usually 2 branches from terminal and often lower nodes, these again terminating in a shortly pedunculate head and 2 branches, this repeated several times in well-developed plants, the branches at a node frequently unequal; leaves opposite, ovate with acute or slightly acuminate apex and serrate to subentire margins, petiole much shorter than blade, blades glabrous or sparsely hispid-strigose above, slightly strigose on midrib beneath, or the whole blade strigose beneath; 1 or more subsessile or very shortly pedunculate heads and in addition frequently a branch in each leaf axil, peduncles short, 1 cm or less, strigose, heads frequently almost sessile; involucre cylindrical, consisting of 2 oblong strigose phyllaries with short foliose tips, and 4 inner chafflike phyllaries identical with 8 chaffy receptacular bracts, these lance-oblong, hyaline, with acute or obtusish or blunt erose tips, somewhat concave, outer 6 bracts or phyllaries subtending ray-florets, producing broad, somewhat concave, elliptic achenes with 2 erect spine-like pappus awns, and a hyaline margin or wing

cut into several upward directed spine-like processes, the 8 sterile or fertile inner achenes, linear-oblong, slightly wider above, pubescent, with 2 strong divergent spinescent slightly hooked papus awns.

In Micronesia known from the Marianas (Agrigan, Pagan, Alamagan, Sarigan, Saipan, Rota, Guam), Carolines (Palau, Yap, Woleai, Namonuito, Truk, Ponape, Kusaie), Marshalls (Kwajalein, Majuro, Jaluit), Gilberts (Butaritari, Tarawa).

USES.—Good for cattle grazing (Guam: *Evans 1742*). The leaves are used for cleaning teeth (Yap: *Cushing 463*).

VERNACULAR NAMES.—

saigon (Guam: *Fosberg 25422*, *Bryan 1055*, *Evans 1742*, *Stone, 1971*).

gobothuth (Yap: *Volkens, 1901*)

lamër ne pan ni pomoon (Yap: *Wong 334*)

malai (Yap: *Cushing 463*)

habulibul (Woleai: *Evans 470*)

appwöneppwya (Truk: *Wong 242*)

kinoj (Marshalls: *Takeuchi, 1959*)

bwilibwilikaj (Majuro: *Stone 953*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: Village, *Fosberg 31434* (US, BISH, Fo).

Pagan: *Kanehira 2215* (NY, FU).

Alamagan: Vicinity of Asongsong village, 3–15 m, *Fosberg 31749* (US).

Sarigan: NW coast, 150 ft [45 m], *Falanruw 1721* (US); 200 ft [60 m], *Falanruw 1768* (US); near village, 10–100 m, *Evans 2363* (US).

Saipan: *Kanehira 933* (FU); *Kamiya 73* (TI); *Momose* in 1930 (TI). N of Agingan Pt., 1–3 m, *Fosberg 25235* (US, BISH, Fo, NY, L); Kagman Peninsula, 120 m, *Fosberg 50538* (US, BISH).

Rota: s.l., *Necker R83* (US); slopes W of As Malote, S side of island, 150 m, *Fosberg 31905* (US, BISH); 250 m, *Fosberg 25102* (US, BISH, Fo, NY).

Guam: Merrill, 1914:154 (citing Mrs. Clemens s.n.); *G.E.S. 149* (US, BISH, NY); *Nelson 53* (BISH); *Agaña, Safford & Seale 1032* (US); 2 mi [3.2 km] SW of *Agaña, Moore 112* (US); 1 km S

of Talofof village, 105 m, *Necker 223* (US); Merizo, 1–5 m, *Fosberg 25422* (US, BISH); Oca Pt., *Glassman 87* (Fo), *28* (Fo); Andersen Air Force Base, *Moran 4410* (UC, Fo, BISH); Atangtano, Piti-Sumay road, sea level, *Bryan 1055* (BISH); college campus, Mangilao, *Stone 4666* (GUAM), *3907* (GUAM); Mt. Santa Rosa, 240 m, *Evans 1742* (US).

CAROLINE ISLANDS.—Palau: s.l., *Koidzumi* in 1915 (TI); *Yamada* in 1925 (TI). Kayangl: Ngmak, *Salsedo 413* (US). Babeldaob: Ngaraard, *Otobed PW-10168* (US), Ngial (Ngiwal), 50 ft [15 m], *Hosaka 3397* (US, BISH, Fo, NY); Kaiguru (Goikul), *Takamatsu 1606* (BISH). Koror: *Kanehira & Okuya 37* (FU); *Kanehira 211* (FU). Malakal: 15 m, *Fosberg 47582* (US, BISH, Fo, NY, L, P). Peliliu: Akalokul, 2 m, *Fosberg 47621* (US, BISH). Angaur: *Umeno* in 1939 (TI); *Kanehira 586* (FU); inside depression on hill on NW corner of island, 25 m, *Fosberg 25911* (US, BISH).

Yap: *Volkens 1901:477* (citing *Volkens 61*); *Kamiya 170* (TI); *Kanehira & Hatusima 4338* (FU); 120 ft [35 m], *Wong 334* (US, BISH); Balabat, *Takamatsu 1889* (BISH); in oppido Dogol, *Tuyama* in 1939 (TI); between Catholic mission and Mt. Matade, 10 m, *Cushing 463* (US).

Woleai: Falalop I., *Evans 470* (Fo).

Namonuito: Ulul I., sight record, *Stone, 1959: 104*.

Truk: *Kanehira 610* (FU, TI); *Koidzumi* in 1915 (TI); edge of grasslands, 125 ft [40 m], *Wong 242* (US, BISH). Dublon: *Kanehira 1935:430–431*; *Hosokawa 1937:202*.

Nukuoro: Nukuoro I., 1–2 m, *Fosberg 26224* (US, BISH, Fo, NY, L).

Ponape: s.l., *Ledermann 13878* (K); *Koidzumi* in 1915 (TI); *Kanehira 722* (BISH, KYO); Sabtic-to, *Hosokawa 6123* (Fo); Ronkiti, Kiti Dist., *Glassman 2799* (US, BISH); *Nakao* in 1941 (KYO); Mt. Tolotom, on the plain, *Takamatsu 1051* (BISH); Parkier, *Kanehira 622* (FU).

Kusaie: Valley S of Lela Harbor, 1–5 m, *Fosberg 26638* (US, BISH). Lele I., *Glassman 2704* (US, BISH); *Takamatsu 338* (BISH).

MARSHALL ISLANDS.—Kwajalein: Kwajalein I., *Fosberg 34120* (US).

Majuro: Uliga I., *Stone 953* (BISH).

Jaluit: Volkens, 1903:91; *Koidzumi* in 1915 (TI);
Jaluit I., Jabor, *Fosberg 39477* (US).

NAURU ISLAND.—Lake Buada, *Fosberg 58648*
(US, BISH).

GILBERT ISLANDS.—Butaritari: *Catala 74* (P);
Butaritari I., village, *Herbst & Allerton 2721* (US).

Tarawa: Bikenibeu I., *Herbst & Allerton 2647*
(US). Betio, *Adair 46* (US); *90* (US).

Tagetes L.

Tagetes L., Gen. Pl. ed. 5, 378, 1754 [1753].

Erect herbs, strongly aromatic, often disagreeably so, leaves opposite or alternate, often compound or pinnately parted, with numerous glandular spots or cavities, also on involucre; heads usually radiate, terminal, solitary or corymbosely arranged; involucre cylindrical or campanulate, of a single series of connate phyllaries, glandular; ray flowers in one series (reduplicate in some cultivated forms), pistillate; disk flowers bisexual, disk corollas 5-lobed; style branches filiform, subobtuse at apex, tips pubescent; achenes linear, black, pappus paleae linear.

A medium-sized tropical American genus with some species cultivated as "African" or "French" marigolds, at least one species rather widespread as a weed. Several forms cultivated in Micronesia as garden flowers. These may be members of a hybrid complex involving a number of original species, highly selected in cultivation.

Tagetes erecta L.

Tagetes erecta L., Sp. Pl., 887, 1753.—Stone, *Micronesica*, 6: 582, 1971.

Erect branched herbs, stems glabrous or puberulent; leaves alternate to opposite or subopposite on same plant, odd-pinnately parted with about 4–5 pairs of elliptic-lanceolate pinnae and several reduced pairs of irregularly lacerate ones below, including ones at the petiole base simulating stipules, pinnae acute at both ends, apex often with a long hairlike tip, margins sharply serrate, some of distal teeth also with hairlike tips, just inside each margin a well-spaced row of round

glands between the serrations; peduncles terminal on branches, up to 15 cm long, the upper third gradually dilated and fistulose, involucre cylindrical-campanulate, of one series of 5–10 (–12?) connate phyllaries with free acute tips, externally beset with conspicuous elliptic to lanceolate glands, ray flowers with limb broadly obovate or spatulate, subtruncate with undulate margin, disk corollas narrowly funnel-form, limb deeply cut into 5 oblong-ovate lobes, in many plants some or all disk corollas variously modified into ligules; style branches filiform and glabrous to flattened and densely ciliate; achenes linear, 10–12 mm long, fertile ones black, sterile ones gray, glabrous to strigose, pappus scales of 2 sorts, 1 or 2 stiff lanceolate long-awned ones, awns antrorsely barbellate, these 10–12 mm or more long, several much shorter thin hyaline scales linear-oblong or narrowly linear, apex acute, obtuse, subtruncate or variously aristate or biaristate, or fimbriate.

Cultivated material assigned to this species belongs to a diverse series of cultivars, possibly involving hybridization with related species. Plants assigned here have long (8–12 mm) achenes, 1 or 2 long subulate pappus scales and several short acute, obtuse, or subtruncate ones. They vary greatly in color, size of head, modification of florets, and shape of smaller pappus scales. Some specimens here referred to *Tagetes erecta* have earlier been identified as *Tagetes patula* L. and *Tagetes tenuifolia* Cavanilles, but seem in essential characters closer to *T. erecta*.

Planted rather generally in gardens but seldom collected. Definitely known from the Marshall and Caroline atolls and Palau.

USES.—Ornamental.

VERNACULAR NAMES.—

marigold (English)

puarang (Lamotrek: *Fosberg & Evans 46754*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam: *Nelson 553* (BISH).

CAROLINE ISLANDS.—Palau: Koror I., Ngesaol, *Hardy 102* (US).

Ulithi: Asor I., cult., *Fosberg 46477* (US).

Faraulap: Piz I., cult., *Fosberg 47295* (US).

Lamotrek: Lamotrek I., cult., *Fosberg & Evans 46754* (US).

Satawan: Satawan I., cult., *Anderson 1081* (US, BISH, Fo, NY); Kutu I., cult., *Anderson 1214* (US, BISH, Fo).

MARSHALL ISLANDS.—Ailinglapalap: Bikajle I., cult., in gardens, 2 m, *Fosberg 26861* (US, BISH).

Jaluit: Majurirek I., seen by Fosberg.

Tithonia Desfontaines

Tithonia Desfontaines, Ann. Mus. Nat. Hist. Naturelle, 1:49–51, 1802.

Large herbs or shrubs with alternate, trinerved leaves; heads large, usually partially terminal on long, inflated peduncles, radiate; receptacle convex, bracteate; involucre of 2–4 series of phyllaries, indurate below, herbaceous distally, recurved, receptacular bracts carinate, folded around florets, acuminate, becoming stiff, enclosing achenes; ray flowers sterile, in 1 series, ligule showy, 2–3 toothed at apex, disk florets bisexual, 5-lobed, anthers sagittate at base, obtuse, style branches acute, pubescent; achenes oblong, usually 2-angled, somewhat compressed, pappus stiff, cuplike, cut into several small scales and 2 awns with broadened bases.

A small Mexican genus with several species occasionally cultivated as ornamentals, one of them widely naturalized in wet tropical areas, including Micronesia.

Tithonia diversifolia (Hemsley) A. Gray

Tithonia diversifolia (Hemsley) A. Gray, Proc. Amer. Acad., 19:5, 1883.—Stone, Micronesica, 6:586, 1971.

Mirasolia diversifolia Hemsley, Biol. Centr.-Am. Bot., 2:168, 1881.

Shrub to 3–4 m tall, stems tending to be zigzag, pubescent when young, loosely branching; leaves alternate, up to 15 × 7–8 cm, 5-lobed but upward on stem 3-lobed or unlobed, lobes acuminate, base truncate to acute, strongly decurrent on petiole, 3 main veins from near base of blade, upper surface scaberulous, lower surface appressed puberulent, petiole 3–5 (–6) cm long;

heads pedunculate, terminal on branches or subpaniculate, peduncles swollen and fistulose above, slightly contracted at summit; heads in bud subglobose, 1.5–2 cm long, when expanded 15 cm across, receptacle low conic, bracteate, involucre broadly campanulate, phyllaries in 3 series subfoliaceous, ovate, longer inward, inner series concave but becoming reflexed, greatly exceeding tightly appressed outer 2 series, acute to obtusish, inner series 8–9, sparsely tomentulose to puberulent or subglabrous; ray flowers about 13, bright yellow, 3–4 × 1 cm, spreading tips recurved, plicate with 2 main folds, narrowly elliptic, apex rounded to acute, entire or bidentate, tube very short, style none, disk yellow, flat at first, becoming convex, florets enfolded in lanceolate acuminate receptacular bracts; corolla tubular, 5-lobed, lobes lanceolate-ovate, slightly incurved and connivent, tube scabridulous below; anther tube narrow, mostly exserted, dark brown; style branches laterally flattened, acuminate, becoming recurved, then tightly coiled, deep yellow; achenes oblong-cuneate, flattened, brown, sericeous; pappus a stiff chafflike cup, bearing 2 unequal rigid awns, the margin otherwise irregularly erose-fimbriate and cut to the base or not into a varying number, from 0 to 6, of squamellae or segments of differing lengths and widths.

In Micronesia, it is known from the Marianas (Guam), Carolines (Ifaluk, Ponape).

USE.—Ornamental.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS.—Guam: Fonte (Commarians Hill) N of upper Fonte River, 150 m, *Fosberg 35587* (US, BISH, Fo, NY); behind Tumon Bay, *Conover 594* (BISH); Mangilao, cult., *Stone 4928* (GUAM).

CAROLINE ISLANDS: Ifaluk: identified on a Kodachrome taken by Don Abbott, 1953.

Ponape: Anapeng-pa, cult., *Takamatsu 706* (BISH).

Tridax L.

Tridax L., Gen. Pl. ed. 5, 382, 1754 [1753]. Powell, Brittonia 17:47–96, 1965.

Herbs of various habit, usually pubescent; leaves opposite, rarely alternate above, simple to

lobed or divided; heads solitary on long peduncles or cymosely paniculate, radiate or discoid, involucre 2–5 seriate, subequal to strongly unequal, herbaceous, inner ones scarious-margined; receptacle conical, convex or almost flat, bracteate; ray flowers when present few, with usually trilobed or tridentate yellow, white or purplish ligules, pistillate and fertile, disk flowers with short tube and long, narrowly cylindrical to funnelform, 5-lobed limb; style branches slender, recurved, apices subulate; achenes broadly or narrowly turbinate to subcylindrical, terete or prismatic or angled; pappus of 10–45, usually about 20 narrow scales or bristles, fimbriate or plumose.

A tropical American genus of about 26 species, one of which has become an ubiquitous pantropical weed, common in Micronesia.

Tridax procumbens L.

Tridax procumbens L., Sp. Pl., 900, 1753.—Burges, ms., ca. 1935.—Hosokawa, Trans. Nat. Hist. Soc. Formosa, 32 no. 220:20, 1942.—Guillaumin, Bull. Soc. Bot. France, 99:22, 1952.—Catala, Atoll Res. Bull., 59:110, 1957.—Stone, Micronesica, 6:586, 1971.—Otobed, Guide List Plants Palau Is., 23, 1971.—Falanruw & Payne, Life on Guam, 71, 1976.

Decumbent herbs, branched, brittle, somewhat pilose, several stems from root crown; leaves opposite, ovate, hastately lobed, margins coarsely serrate, teeth uneven, smaller toward apex, blade 3–3.5 × 2–2.5 cm, somewhat pilose, very sparsely so above, more so on veins beneath, apex acute, base obtuse, main veins 3, petiole short; heads solitary on long peduncles arising terminally, subtended by 2 lateral branches; involucre broadly cylindrical, phyllaries in 2 series, ovate, outer slightly shorter, strongly pilose, green, bluntly mucronate-tipped, inner ones thinner, purplish, more acute, less pilose; receptacular bracts lanceolate, strongly acuminate or cuspidate, hyaline with purple tips; ray flowers pappose, pistillate, ligule small, broad, pale yellow or cream white, strongly 3-toothed; disk flowers light yellow, tubular, with 5 oblong-ovate lobes; style branches pale yellow, recurved, tips weakly acuminate; achenes about 2 mm long, shortly prismatic,

slightly obconic, notably appressed hirsute, hairs at base shorter and strongly spreading, summit flat, crowned with a spreading circle of about 20 plumose bristles. At maturity the involucre is reflexed, and the chaffy receptacular bracts form a globose pale mass, conspicuous from a distance.

In Micronesia it is known from the Marianas (Saipan, Tinian, Rota, Guam), Carolines (Palau, Yap, Ulithi), Marshalls (Kwajalein), Nauru, Gilberts (Butaritari, Tarawa).

VERNACULAR NAMES.—
coat buttons (English)
wild daisy (English)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: S of Puntan Magpi, NW coast, 30 m, *Fosberg 31328* (US, BISH, Fo); Marpi, open field, *Courage 49* (US).

Tinian: N field, *Kondo 21* (BISH).

Rota: Near Mochon, *Kondo s.n.* (BISH); West Dock, 5–10 m, *Evans 1955* (US, BISH, Fo, NY, L).

Guam: Andersen Air Force Base, *Moran 4420* (BISH, Fo, UC); Mangilao, college campus, *Stone 3796* (GUAM); *Pedrus 64* (US); Guam Memorial Hospital, 30 m, *Evans 224* (US, BISH, Fo, NY, L, P, A, DUKE, K).

CAROLINE ISLANDS.—Palau: Babeldaob: Gasupan, (Ngaspan), *Hosokawa 9703* (A). Peliliu: *Salcedo 140* (US). Angaur: S edge of boat basin, 2 m, *Canfield 417* (US).

Yap: *Kusano* in 1919 (TI).

Ulithi: Asor I., 1–2 m, *Fosberg & Evans 46389* (Fo).

MARSHALL ISLANDS.—Eniwetok: Enewetak I., *Lamberson* in 1975 (Mi). Kwajalein: Kwajalein I., *Fosberg 31165* (US, BISH, Fo, NY, L).

NAURU ISLAND.—Burges, ms. ca. 1935; Meneng, *Fosberg 58657* (US, BISH).

BANABA (OCEAN I.).—Catala 1957:110.

GILBERT ISLANDS.—Butaritari: Butaritari I., *Herbst & Allerton 2696* (US).

Tarawa: Betio I., *Catala 54* (P), *Adair 26* (US), *137* (US, BISH). Bairiki I., *Sachet 1407* (US), *1408* (US).

Vernonia Schreber

Vernonia Schreber, Gen. Pl. 2:541, 1791 [nom. cons.].

Cyanopsis Blume in Blume & Fischer, Fl. Jav. p. VI, 1828.

Herbs, shrubs, woody scramblers, or trees; leaves alternate, simple; heads in terminal, often scorpioid cymes or cymose panicles; the heads discoid, usually purple or white; involucre of several series of closely imbricate bracts, outer

ones gradually shorter; receptacle flat, ebracteate; corollas tubular with campanulate or funnelliform 5-lobed limb; style branches subulate; achenes prismatic, subfusiform, cylindric or turbinate, summit truncate; pappus of 2 series of scabrous bristles, outer series shorter, rarely paleaceous.

A vast genus of the tropics and subtropics, a few species in temperate areas, 3 species known from Micronesia, all possibly introduced, or possibly indigenous in some islands.

Key to Micronesian Species of *Vernonia*

1. Woody vines or scramblers, pappus dull orange or tan *Vernonia cuneata*
1. Erect or depressed herbs, pappus white 2
 2. Involucres hemispheric, about 1 cm across, containing 75–100 florets *Vernonia patula*
 2. Involucres campanulate, about 5 mm across or less, containing 20–25 flowers *Vernonia cinerea*

Vernonia cinerea (L.) Lessing

Vernonia cinerea (L.) Lessing, Linnaea, 4:291, 1829.—Volkens, Bot. Jahrb., 31:477, 1901; Notizbl., 4:91, 1903.—Safford, Contr. U.S. Nat. Herb., 9:396, 1905.—Merrill, Phil. Jour. Sci. Bot., 9:154, 1914.—Koidzumi, Bot. Mag. Tokyo, 29:255, 1915.—Kanehira, Enum. Micr. Pl., 431, 1935.—Burges, ms., ca. 1935.—Hosokawa, Bull. Biogeogr. Soc. Japan, 7:202, 1937.—Okabe, Jour. Jap. Forestry Soc., 23(5):271, 1941.—Guillaumin, Bull. Soc. Bot. France, 99:22, 1952.—Glassman, Bishop Mus. Bull., 209:98, 1952; Pac. Sci., 7:296, 301, 304, 308, 1953.—Luomala, Bishop Mus. Bull., 213:23, 47, 109, 1953.—Catala, Atoll Res. Bull. 59:111, 1957.—Stone, Pac. Sci., 13:104, 1959.—Niering, Atoll Res. Bull., 76:3, 1961.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.—Otobed, Guide List Plants Palau Is., 24, 1971.—Stone, Micronesica, 6:593–594, 1971.—Fosberg, Falanruw & Sachet, Smithsonian Contr. Bot., 22:43, 1975.

Conyza cinerea L., Sp. Pl. 862, 1753.

Vernonia parviflora Reinwardt ex Blume, Fl. Ned. Ind., 893, 1826.—Safford, Contr. U.S. Nat. Herb., 9:396, 1905.—Kitamura, Act. Phyt. Geobot., 10:73, 1941.—Hosokawa ms., n.d.

Vernonia cinerea var. *parviflora* (Reinwardt ex Blume) de Candolle, Prodr. 5:24, 1836.—Koster, Blumea, 1:414, 1935.

Vernonia cinerea var. *typica* Koster, Blumea, 1:408–412, 1935.

One to several erect, striate stems from base, sparingly branched, to at least 75 cm, finely appressed pubescent, minutely glandular, often

with scattered erect hairs or subglabrous below; leaves with oval to ovate or lance-ovate blades, abundantly punctate glandular and papillate-puberulent, obtuse to acute at apex, bluntly serrate, abruptly or gradually narrowed, acute and decurrent to various levels on petioles that about equal blades in larger lower leaves, becoming smaller and less petiolate upward, reduced to irregular bracts just below and at lower ramifications of the loosely cymose inflorescences; these terminal on branches, the whole upper part of well-developed plants appearing cymose-paniculate; heads cylindric-campanulate; phyllaries unequal, imbricate, erect, with dark purple, sharply mucronate tips; corollas purple, lobes short blunt, just exceeding the pappus; achenes weakly to not at all angled, with strongly appressed pubescence; pappus white and capillary, becoming conspicuously exerted, spreading, forming a broad crown when achenes mature.

ABNORMALITIES.—An occasional abnormal form of this species, known from Palau and Samoa, has a condensed habit, very leafy stems with short internodes, small leaves, and very few heads. That it is certainly an abnormality is shown by a Samoan specimen (*Christophersen & Hume 1939*

(BISH)) that has several branches of this sort on an otherwise normal plant. An abnormal plant from Eniwetok (*St. John 23710* (BISH)) with the stem much thickened is not the same and may be the result of exposure to radioactivity.

In Micronesia known from the Marianas (Maug, Asuncion, Agrigan, Pagan, Alamagan, Guguan, Sarigan, Anatahan, Saipan, Tinian, Guam), Carolines (Palau, Sonsorol, Pulu Anna, Tobi, Yap, Ulithi, Fais, Woleai, Ifaluk, Lamotrek, Satawal, Puluwat, Namonuito, Truk, Nama, Lukunor, Satawan, Kapingamarangi, Ant, Ponape, Mokil, Pingelap, Kusaie), Marshalls (Eniwetok, Kwajalein, Likiep, Ailinglapalap, Majuro, Arno, Jaluit, Ebon), Nauru, Gilberts (Butaritari, Tarawa, Tabiteuea, Onotoa).

If varieties are distinguished in this species, the Micronesian material would belong in var. *parviflora*, as the heads are mostly rather short. However, the varieties merge into each other to the extent that it does not seem worthwhile to maintain var. *parviflora*—at least for the Micronesian populations.

USES.—The young leaves are used for food (Jaluit; Okabe, 1941:271).

VERNACULAR NAMES.—

papago (Agrigan: *Falanruw 2161*)
 chaguan Santa Maria (Guam: *Fosberg 25377*; Stone, 1971)
 edngeong (Palau: *Otobed PW-10104*)
 etngeong (Palau: *Otobed PW-10104*)
 gasngeong (Palau: Hosokawa ms.)
 mami (Yap: *Fosberg 46551*)
 manginarö (Yap: *Wong 382*)
 chor aniti wai (Lamotrek: *Fosberg & Evans 46823*)
 opusar (Satawal: *Fosberg 46880*)
 anachuko (Truk: Glassman, 1953)
 enencuko (Truk: *Wong 145*)
 ennentuku (Truk: *Fosberg 24423*)
 ennetoku (Truk: Glassman, 1953)
 (koboasu) (Truk: Hosokawa, 1937)
 nencuko (Truk: *Wong 145*)
 troboasu (Truk: Hosokawa, 1937; Glassman, 1953)
 lipoising (Lukunor: *Anderson 2069*)
 lupoisng (Satawan: *Anderson 1086*)
 lüpūanalō (Satawan: *Anderson 978*)
 keinga (Kapingamarangi: *Niering 500*)
 mussen-buel (Mokil: *Glassman 2623*)
 musenibuil (Pingelap: *Glassman 2656*)
 janailin nōnailiñ (Arno: *Stone 1050*)
 janailiñ nōñailiñ (Arno: *Anderson 3619*)
 roti (Tabiteuea: Luomala, 1953)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Maug: S central East I., 100 ft [30 m], *Falanruw 2249* (US).

Asuncion: SW slope, 250 ft [75 m], *Falanruw 2270* (US); S slope of summit, 830 m, *Falanruw 3062* (US).

Agrigan: Village, *Fosberg 31430* (US, BISH, Fo); SW coast below 300 ft [90 m], *Falanruw 2161* (US).

Pagan: Isthmus, 6–10 m, *Anderson 569* (US, BISH, Fo, NY, L); Mt. Pagan, *Moore 380* (US); Fresh Water Lake, *Fosberg 31400* (US).

Alamagan: 450 ft [135 m], *Falanruw 1896* (US); landing area, *Falanruw 1949* (US); Partido village, *Fosberg 31649* (US).

Guguan: SW coast, 5 m, *Falanruw 3112* (US).

Sarigan: Near anchorage, 100 ft [30 m], *Falanruw 1718* (US); near village, 10–100 m, *Evans 2362* (US, BISH, Fo, NY).

Anatahan: s.l., *Hosokawa 7856* (Fo); NW corner of island, 300 ft [90 m], *Falanruw 1623* (US).

Saipan: *Stephens 53* (Fo); *Kamiya 51* (TI); *Momose* in 1930 (TI); 100 ft [30 m], *Kanehira 13* (FU); N of Agingan Pt., 1–3 m, *Fosberg 25250* (US, BISH, Fo); S side of Kagman Peninsula, W of Kagman Pt., 30 m, *Fosberg 31299* (US).

Tinian: *Okatani 74* (FU); terrace NE Carolinas (Lalo) Pt., 60–80 m, *Fosberg 24820* (US, BISH, Fo, NY, L).

Guam: Merrill, 1914:154; *G.E.S. 70* (US, BISH, NY); Mt. Tenjo, 320 m, *Bryan* in 1936 (BISH); 1000 ft [305 m], *Necker 73* (BISH); Andersen Air Force Base, *Moran 4413* (UC, Fo, BISH); at Air Base, *Walker 7411* (US); Malojloj Beach, *Evans 1465* (US); Lujuna, *Evans 1604* (US); Atangtano, between Piti and Sumay, sea level, *Bryan 1058* (BISH); Tumon Bay, *Rodin 513* (US); Ypao Pt., *Necker 108* (US); Agfayan Bay, *Necker 175* (US); N of Northwest Field, 500 ft [150 m], *Steere 4* (US); 1 mi [1.6 km] SE of Agat, 5–50 ft [1.5–15 m], *Moore 255* (US); Merizo, 1–5 m, *Fosberg 25377* (US, BISH); Mangilao, college campus, *Pedrus 65* (US, GUAM); Pati Pt., *Necker 333* (A).

CAROLINE ISLANDS.—Palau: *Yamada* in 1925 (TI); *Nakao* in 1941 (KYO). Babeldaob: *Kaiguru, Takamatsu 1608* (BISH); *Arekelong, Tuyama* in 1939 (TI); *Melegeok, Tuyama* in 1939 (TI); *Ime-*

liik, *Otobed PW-10104* (US). Koror: *Salsedo 292* (US); *Blackburn E 13* (US); *Kanehira 204* (BISH, FU); Arakamai, *Kanehira & Nisida 24* (FU). Peli-liu: *Tuyama* in 1937 (TI). Angaur: *Fosberg 25981* (US, BISH); *Kanehira 587* (FU).

Sonsorol: Along old railroad, *Hardy 127* (US).

Pulu Anna: *Salsedo 377* (US).

Tobi: *Salsedo 380* (US); *Hardy 140* (US, BISH).

Yap: Volkens, 1901:477; Dogol, *Tuyama* in 1939 (TI); near Catholic Mission, *Blackburn 245* (US); Lamer village, *Cushing 491* (US); Dalipebinaw Dist., *Fosberg 46551* (US); Gagil, near beach, *Wong 382* (US, BISH); Tadiol, *Takamatsu 1819* (BISH).

Ulithi: Fasserai I., around village, 2-4 m, *Fosberg & Wong 25440* (US, BISH). Mogmog I., in village 1-2 m, *Fosberg & Evans 46378* (Fo); 2-4 m, *Fosberg & Wong 25511* (US, BISH, Fo, NY, L).

Fais: 15 m, *Fosberg 46700* (US); Lechochey, 5 m, *Evans 344* (US, BISH, Fo).

Woleai: Wottagai (Utagal) I., 1-2 m, *Fosberg 47066* (US, BISH, Fo).

Ifaluk: Ifaluk I., 1-2 m, *Fosberg 47185* (US). Falalap I., *Abbott & Bates 103* (US, BISH). Falarik I., *Abbott & Bates 50* (US, BISH).

Lamotrek: Lamotrek I., 1 m, *Fosberg & Evans 46823* (US).

Satawal: Satawal I., northside, 2 m, *Fosberg 46880* (US).

Puluwat: Puluwat I., sight record, Niering 1961:3.

Namonuito: Ulul I., observed, Stone, 1959:104.

Truk: Ulalu, 3 ft [1 m], *Wong 145* (US, BISH); *Koidzumi* in 1915 (TI). Moen: New site of Mechetiu village on NE coast SE of Bou Bay, 0 m, *Fosberg 24423* (US, BISH). Uoala (Uola) I., *Moore 119* (US). Dublon (Natsushima): *Takamatsu 153* (BISH). Tol: Hosokawa, 1937:202. Pis: 1-2 m, *Fosberg 24668* (US).

Nama: Center of island, 3-5 m, *Evans 1310* (US).

Lukunor: Lukunor I., *Anderson 2129* (US, BISH, Fo, NY, L). Oneap I., *Anderson 2069* (US, BISH).

Satawan: Moch I., *Anderson 978* (US, BISH, Fo, NY, L). Satawan I., *Anderson 1086* (US, BISH, Fo).

Kapingamarangi: Taringa I., *Niering 500* (US).

Ant: Glassman, 1953:304, observed.

Ponape: *Kanehira 684* (TI); Net Dist., *Nakao* in 1941 (KYO); Kiti Dist., Ron Kiti, *Nakao* in 1941 (KYO); vicinity of Colonia, 50 ft [15 m], *Glassman 2583a* (US); *Kanehira 684* (FU); Anapeng-pa, *Takamatsu 694* (BISH); Nanmatol I., on temple platform, 1-3 m, *Fosberg 26375* (US, BISH, Fo).

Mokil: Kalap I., *Glassman 2623* (US).

Pingelap: Pingelap I., *Glassman 2656* (US, BISH).

Kusaie: Kusaie I., *Rainey 34* (US). Lele I., *Takamatsu 339* (BISH).

MARSHALL ISLANDS.—Eniwetok: Eniwetok I., *St. John 23710* (US, BISH); 1-4 m, *Fosberg 24368* (US, BISH, Fo, NY, L). Engebi I., 1-5 m, *Fosberg 24382* (US, BISH, Fo, NY, L).

Kwajalein: Ebeye I., *Fosberg 31209* (US, BISH). Kwajalein I., *Bryan s.n.* in 1944.

Likiep: Likiep I., 1-2 m, *Fosberg 26990* (US, BISH, Fo, NY, L).

Ailinglapalap: Airik, *Fosberg 26897* (US, BISH).

Majuro: Uliga I., near Mieco landing, *Stone 958* (BISH).

Arno: Ine I., *Stone 1050* (Fo); *Anderson 3619* (US).

Jaluit: *Koidzumi* in 1915 (TI); *St. John 21700* (BISH). Jaluit I., Jabor, *Fosberg 39484* (US). Imruj I., in village, *Fosberg 26750* (US, BISH, Fo).

Ebon: Wedan-To I., *Stone 1007* (BISH).

NAURU ISLAND—Burgess, ms. Meneng, *Fosberg 58611* (US, BISH).

GILBERT ISLANDS.—Butaritari: Butaritari I., *Herbst & Allerton 2706* (US).

Tarawa: Teaoraereke, *Catala 52* (P); Abaokoro, *Adair 121* (BISH, US); Betio, *Adair 9* (US). Bikenibeu I., *Herbst & Allerton 2646* (US).

Tabiteuea: Utiroa village, *Luomala 4* (BISH).

Onotoa: S of village of Aiaki, *Moul 8193* (US, BISH, Fo).

***Vernonia cuneata* Lessing**

Vernonia cuneata Lessing, *Linnaea* 6:644, 1831.—Kitamura, *Act. Phyt. Geobot.*, 10:73, 1941.

Vernonia pyrhopappa sensu Kanehira, *Enum. Micr. Pl.*, 431, 1935 [non Schultz-Bipontinus ex Klatt, *Flora*, 68:203, 1885 (as *Vernomia*)].

Scandent shrub, subglabrous to puberulent, stems terete, somewhat striate, leaves and branch-

ing alternate; leaves simple, thin, broadly elliptic-obovate, abruptly and sharply acuminate, base cuneate-contracted, blade about $6 \times 3-3.5$ cm, venation not prominent, petiole 1 cm or less; distal parts loosely and irregularly paniculate, heads in clusters of several in axils of upper leaves, which become smaller distally, whole inflorescence elongate pyramidal, branches widely divaricate; heads of 5-7 florets; involucre broadly campanulate, of 3-4 series of phyllaries spirally imbricate, the phyllaries 1-1.5 mm wide, oblong, inner ones 5-6 mm long, outer series gradually shorter, glandular puberulent on outer surface, acute; corolla tubular below, funnellform above, deeply 5-lobed, lobes lanceolate, acute; achenes subprismatic, about 4 mm long, gradually narrowed to base, light to medium brown, weakly 5-angled, with shallow furrows between angles, strongly granulate-glandular, crowned with a spreading ring of 25-30 dull orange or tan pappus bristles 7-8 mm long.

An uncommon Malaysian-Philippine species with Palau as the Pacific limit of its distribution. Originally described from Rawak on the basis of a Gaudichaud specimen, now possibly in Leiden.

The Palau plant does not fit exactly any of the species to which it has been referred, but comes closest to *Vernonia cuneata* except for its acuminate leaf apices.

CAROLINE ISLANDS.—Palau: Babeldaob: Aimi-riik, *Kanehira 2315* (US, NY, FU); Kamiangaru Nekken, *Hosokawa 9710* (A); Airai Colony, *Nishida* in 1939 (TI); Galdok, *Hatushima 5008* (FU).

Vernonia patula (Dryander) Merrill

Vernonia patula (Dryander) Merrill, Phil. Jour. Sci. Bot., 3: 439, 1908; 9:154, 1914.—Koster, Blumea, 1:433, 1935.—Stone, Micronesica, 1:129, 1964; 6:594, 1971.—Fosberg & Sachet, Smiths. Contr. Bot., 45:30, 1980.

Conyza patula Dryander in Aiton, Hort. Kew., 3:184, 1789.

Vernonia chinensis sensu Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835.—Schumann & Lauterbach, Fl. Süds., 595, 1901 [non(L.) Lessing, Linnaea, 6:105, 1831].

Cyanopsis pubescens de Candolle, Prodr., 5:69, 1836.—Safford, Contr. U.S. Nat. Herb. 9:252, 1905 [as *Cyanopsis*].

Vernonia villosa (Blume) Wight in Safford, Contr. U.S. Nat. Herb., 9:396, 1905.—Stone, Micronesica 1:129, 1964.

Vernonia patula var. *pubescens* (Blume) Koster, Blumea, 1:430-435, 1935.

Erect to somewhat depressed herb to 4 dm tall, stems thinly to sparsely arachnoid tomentose, striate, paniculately branched above; leaves alternate, rhombic to elliptic or obovate, to 4×2 cm, acute to somewhat obtuse at apex, acute to attenuate at base, upper surface very sparsely sericeous to papillate-puberulent, green, under surface appressed sericeous-tomentose or thinly arachnoid-tomentose, petiole to 1 cm, usually shorter; heads purple, in upper axils and terminal in cymose clusters of 3-several, shortly pedunculate, peduncles to 1 cm or somewhat more; involucre hemispheric, about 1 cm wide, of about 4 series of spirally imbricate lanceolate phyllaries, the inner longest, obtusish or acute at apex, the rest spinulose-tipped, firm, outer tending to be somewhat squarrose, sparsely pilosulous, inner ones purple distally; florets numerous, little exceeding involucre, limb funnellform-campanulate, prismatic in bud, tip glandular, lobes 5, lanceolate, anther tube white; style-branches not greatly exceeding corolla, hirtellous, pointed; achenes about 1.5 mm long, prismatic, pale to dark tan, glabrous with sessile glands or resin droplets near base or the full length in the intervals, inner 4-angled, outer tending to be curved with 4 ribs on curved side, two inner faces at an angle, 2 closely parallel ribs on inner angle, pappus of 8-10 stiff white caducous bristles.

An eastern Asiatic-Malaysian species extending to New Guinea, probably introduced into Guam, as it is known nowhere else in Micronesia except for a casual reference by Koster (1935:433) to the Carolines.

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—s.l., de Candolle, 1836:69 (citing Haenke).

Guam: s.l., de Candolle, 1839:69 (citing Chamisso); Endlicher, 1835:168 (citing Chamisso); Merrill, 1914:154 (citing G.E.S. 456); *Astrolabe 52* (GH), *1628* (GH); *G.E.S. 69* (US, BISH, NY); *Guerrero 748* (BISH); *Marche 75* (P, Fo); *Hombron* in 1841 (P, Fo); *Le Guillou 1* (P), 22 (P); Agaña, *Seale* in 1900 (BISH); 2 km S of Piti, *Necker 180* (US); Piti, *Swezey* in 1936 (BISH); Dan Dan (Martinez Pasture), 110 m, *Fosberg 35552* (US,

BISH, Fo, NY); Umatac, along strand, 1 m, *Fosberg 35413* (US, BISH, Fo, NY, L); old fort, *Stone 4910* (GUAM); Pago Bay, *Falanruw 1350* (US); Cella Bay, *Cushing & Falanruw 721* (US); Mangilao, *Schmull 57* (GUAM).

CAROLINE ISLANDS.—s.l., Koster, 1935:433.

Wedelia Jacquin

Wedelia Jacquin, Enum. Pl. Carib., 8, 28, 1760 [nom. cons.].

Herbs or shrubs, leaves opposite, trinerved; heads radiate, on peduncles usually terminal subtended by two branches; involucre of 2–3 series of phyllaries, outer foliaceous, inner paleaceous; receptacular bracts enclosing achenes; ray florets in one outer series, pistillate, fertile, ligules yellow; disk florets bisexual, corolla tubular campanulate, 5-lobed; ray achenes triangular in cross section, disk achenes clavate, slightly compressed when fertile, constricted above into a narrow neck, prismatic when sterile, pappus often of small scales, sometimes with 2 awns.

A mostly American genus of few or many species, depending on the circumscription adopted, here accepted in a narrow sense; only 1 introduced species known in Micronesia.

Wedelia trilobata (L.) Hitchcock

Wedelia trilobata (L.) Hitchcock, Missouri Bot. Gard. Ann. Rept. 4:99, 1893.
Silphium trilobatum L., Syst. ed. 10, 576, 1759.

Prostrate or decumbent, mat-forming extensively creeping herb, rooting at nodes, terete stems pilose with antrorsely appressed hairs; leaves opposite, very variable in outline, obovate to oblong, when oblong, strongly trilobed at about middle, below lobes blade forms what appears to be a broadly winged petiole, wings abruptly contracted to a truncate or auriculate base, apical lobe obtuse to acute, upper margins coarsely serrate, strongly triplinerved, upper and lower surfaces very sparsely appressed hispid, lower surface gland-dotted, free part of petiole thick, 2–3 mm long and wide, sheathing at extreme base; peduncles solitary, terminal, more rarely axillary or perhaps pseudoaxillary, 2–6 cm long, rather thick,

antrorsely pilose; involucre campanulate, of 2 series of ovate-oblong foliaceous phyllaries, subequal to somewhat unequal, the inner somewhat shorter, 4–5 in each series; receptacular bracts scarious, obovate or oblanceolate to lanceolate, apex acute, upper margin erose-ciliate, partly enfolding ovaries; ray florets pistillate, ligules yellow, about 10 × 5 mm, with 3 teeth apically; disk corollas yellow, narrowly campanulate, 4–5 mm long, tube much shorter than subcylindric limb, teeth 5, triangular; anther tube black, scarcely exerted or only tardily so, about 2 mm long; style branches yellow, linear, grooved on inner side, acute, puberulent, erect becoming recurved; achenes puberulent above, those of ray flowers triangular in cross section, swollen, outer face somewhat convex, somewhat rugose, angles rounded, disk achenes when fertile clavate, terete, summit contracted to a neck, somewhat stipitate below, when sterile subprismatic to slightly compressed; few achenes maturing in cultivated clone in Pacific; pappus a crown of short fimbriate scales.

In Micronesia it is known from the Marianas (Guam, Carolines (Palau), Marshalls (Eniwetok, Kwajalein, Majuro), Nauru, where it is cultivated. On Guam it has increased enormously, planted as a ground-cover in place of lawns around hotels, parks, etc. It is very vigorous and flowers abundantly.

USES.—Ornamental.

VERNACULAR NAME.—Ngesil ra ngebard (Palau: Otobed, 1977:32)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Guam, Tumon Bay, *Fosberg 58195* (US).

CAROLINE ISLANDS.—Palau, Otobed, 1977:32.

MARSHALL ISLANDS.—Eniwetok, *Lamberson 29* (Mi); Kwajalein: Kwajalein I., 0–4 m, planted, *Fosberg 48067* (US); Majuro, sight record, Fosberg in 1978.

NAURU ISLAND.—Meneng, planted, *Fosberg 58609* (US).

Wollastonia de Candolle ex Decaisne

Wollastonia de Candolle ex Decaisne, Nouv. Ann. Mus. Paris, 3:414, 1834; Prodr., 5:546–549, 1836.

Wedelia sensu auct. plur. pro parte [non Jacquin, Enum. Pl. Carib., 8, 28, 1760].

Stemmodontia sensu auct. Micr. [non Cassini, Bull. Soc. Philom. Paris, 11, 1817].

Weak shrubs, suffrutescent herbs, and herbs with a resinous odor, leaves opposite, tending to be trinerved, estipulate; inflorescences very open, terminal with 3–5 or more pedunculate radiate heads, sometimes associated in open corymbiform panicles, or heads solitary; involucre of one principal whorl with a few smaller phyllaries at base; receptacular bracts strongly nerved, limb obtuse, sometimes apiculate, pubescent, enfolding achenes; outer whorl of florets ligulate yellow, ligules more or less toothed at apex, disk corollas yellow or greenish yellow, 5-lobed; achenes thick 3 (–4)-angled, those of ray flowers convex on outer face, all or mostly well developed, underdeveloped ones scattered, summit of achenes blunt, strongly hirtellous, with a circle of setulae, lower part glabrous; pappus of 1 short awn or this absent.

A small genus of a few Asiatic-Pacific species, usually referred to *Wedelia*, but closer to *Melanthera*, and close to, if not actually including, the Hawaiian *Lipochaeta* de Candolle (Fosberg and Sachet, 1980).

This genus badly needs revision. The Micronesian plants are usually regarded as a single species with two varieties.

Wollastonia biflora (L.) de Candolle

Wollastonia biflora (L.) de Candolle, Prodr. 5:546, 1836.—Fosberg & Sachet, Smithsonian Contr. Bot., 45:32, 1980.

Verbesina biflora L., Sp. Pl. ed. 2, 1272, 1763.

Verbesina strigulosa Gaudichaud, Bot. Voy. Uranie 463, 1826 [1829].

Wollastonia strigulosa (Gaudichaud) de Candolle ex Decaisne, N. Ann. Mus. Hist. Nat., 3:414, 1834.

Wollastonia scabriuscula de Candolle ex Decaisne, Ann. Mus. Hist. Nat. 3:414, 1834 [nom superfl. illegit. = *Wollastonia biflora* (L.) de Candolle].

Wedelia strigulosa (de Candolle) Schumann, Bot. Jahrb., 9: 223, 1888 [preprint 1887?] [parenthetical author wrongly cited].—Schumann & Lauterbach, Fl. Süds., 600, 1901.—Volkens, Notizbl., 4:91, 1903.—Luomala, Bishop Mus. Bull., 213:87, 1953.

Wedelia aristata Lessing, Linnaea, 6:160, 1831.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835.—Guillaumin,

Bull. Soc. Bot. France, 99:22, 1952.

Wedelia biflora (L.) de Candolle in Wight, Contrib. Bot. Ind., 18, 1834.—Engler, Notizbl., 1:226, 1897.—Volkens, Bot. Jahrb., 31:477, 1901.—Schumann & Lauterbach, Fl. Süds., 600, 1901.—Volkens, Notizbl., 4:91, 1903.—von Prowazek, Deutsch. Marianen, 121, 1913.—Koidzumi, Bot. Mag. Tokyo, 29:255, 1915.—Kanehira, Enum. Pl. Micr., 431, 1935.—Krämer, in Thilenius, Erg. Süds. Exp., IIB 10, 1:298, 389, 426, 1937.—Hosokawa, Bull. Biogeogr. Soc. Jap., 7:202, 1937.—Kitamura, Act. Phyt. Geobot., 10:73, 1941.—Okabe, Jour. Anthrop. Soc. Nippon, 56: 420, 422, 1941; Jour. Jap. For. Soc., 23:271, 1941; Nankyo, 2:14, 20, 31, 32, 39, 48, 1943.—St. John, Pac. Sci. 2:104, 112, 1948.—Taylor, Pl. Bikini, 203, 1950.—St. John, Pac. Sci., 5:286, 1951.—Glassman, Bishop Mus. Bull., 209:98, 1952; Pac. Sci., 7:296, 304, 308, 1953.—Catala, Atoll Res. Bull., 59:111, 1957.—Stone, Pac. Sci., 13:104, 1959.—Niering, Atoll Res. Bull., 76:3, 1961.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.—Stone, Micronesica, 1:128, 1964.—Otobed, ms. 1967; Guide List Plants Palau Is., 24, 1971.—Alkire, Micronesica, 10:1974.—Hosokawa, ms., n.d.

Stemmodontia biflora (L.) W. F. Wight in Safford, Contr. U.S. Nat. Herb., 9:377, 1905.—Stone, Micronesica, 1:128, 1964.

Large sprawling, tangled, or even loosely mat-forming herbs, or plants slightly woody below, stems glabrous to hispidulous or shortly sparsely hirsute, irregularly sulcate when dry, strongly resinous; leaves opposite, ovate to broadly ovate, bases acute to obtuse or subcordate, slightly decurrent, apices acuminate, margins serrate, teeth tending to be uneven, main veins few, 3–5 plinerved, usually appearing palmately 3-nerved from just above base of blade, both surfaces finely strigose, especially on veins, upper less so, general appearance green or grayish, petioles long, rather slender, leaves of sterile shoots often much larger and subcordate to cordate; heads in loose irregularly corymbiform panicles of several to 20 or more, about 2 cm across; phyllaries in 2 series, ovate or ovate-lanceolate, outer subfoliaceous; rays fertile, 6–10 or more, ligules yellow, subentire or slightly toothed at apex, disk corollas with short tube, limb funnellform-campanulate to prismatic-campanulate, lobes deltoid; disk becoming globose at maturity; achenes 2.5–4 mm long, those of the ray flowers 3-angled, depressed in the center of the top, those of the disk cuneoid, 4-angled.

Key to Micronesian Varieties of *Wollastonia biflora*

- Achenes 2.5–4 mm long, plants usually green ***Wollastonia biflora* var. *biflora***
 Achenes 1.5–2(-3) mm long, plants usually rather grayish or grayish green ***Wollastonia biflora* var. *canescens***

Wollastonia biflora* (L.) de Candolle var. *biflora

Known in Micronesia from the Carolines (Palau, Sonsorol, Yap, Ulithi, Fais, Eauripik, Woleai, Faraulap, Ifaluk, Lamotrek, Satawal, Puluwat, Namonuito, Murilo, Nomwin, Truk, Nama, Losap, Namoluk, Etal, Lukunor, Satawan, Nukuoro, Kapingamarangi, Ant, Ponape, Mokil, Pingelap, Kusaie), Marshalls (Eniwetok, Bikini, Ailinginae, Rongelap, Ujelang, Ujae, Wotho, Lae, Kwajalein, Ailuk, Likiep, Aur, Ailinglapalap, Majuro, Arno, Namorik, Jaluit), Gilberts (Abaiang).

USES.—A handful of the young leaves mixed with the young leaves of *Piper betle* are eaten for gonorrhoea (Palau: Okabe, 1941; 1943). "The leaves are pounded, then mixed with coconut juices and taken internally for stomach upset. The vine is also pounded, and the juices are applied to a cut or bite caused by dogs" (Sonsorol: *Berry* 21). Juice of leaves and stems used for wounds; juice of stem squeezed out together with copra, taken once a day for stomachaches; bark of root with young leaves of *Jussiaea erecta* crushed together, sap taken with coconut milk 3 times a day, for gonorrhoea (Yap: Okabe, 1943). Flowers used in treatment of boils, leaves and flowers used medicinally (Eauripik: *Fosberg & Evans* 47113); "for illness caused by spirit" (Woleai: *Alkire* 9); "used for maremars" (Nomwin: *Evans* 1136); used in magic to assure that a canoe will not break apart; leaves are used as mulch (Namoluk: *Marshall* 33). Said to be eaten by cattle (Kusaie: *Fosberg* 26653). Used as medicine after confinement (Kusaie: Okabe, 1941). Flowers used in garlands, leaves in compost (Abaiang: *Catala*, 1957).

VERNACULAR NAMES.—

gesil (Palau: Okabe, 1943)
 lesil (Palau: *Emmons* 93)

ngasil (Palau: Hosokawa ms.)
 ngesil (Palau: Okabe, 1941; Otobed, 1971)
 hassih (Sonsorol: *Berry* 21)
 suh (Yap: Okabe, 1943)
 thu (Yap: *Takamatsu* 1920; *Wong* 306; Hosokawa, ms.)
 eatheuth (Ulithi: *Lessa* 84)
 yat yut (Ulithi: *Fosberg & Evans* 46408)
 yath yuth (Ulithi: *Fosberg* 25456)
 ëthiath (Fais: Krämer, 1937)
 wal (Eauripik: *Fosberg & Evans* 47113)
 vān (Woleai: Krämer, 1937)
 waadi (Woleai: *Wong* 42)
 al (Woleai: *Evans* 452; *Alkire* 9, *Alkire*, 1974)
 atiot (Faraulap: *Fosberg & Evans* 47312)
 atiot (Ifaluk: *Fosberg* 47209)
 iatuiat (Ifaluk: *Abbott & Bates* 3)
 yatuyet (Ifaluk: *Abbott & Bates* 3)
 atiot (Lamotrek: *Fosberg & Evans* 46788)
 atiat (Satawal: *Fosberg & Evans* 46920)
 adiat (Namonuito: Stone, 1959)
 atugat (Namonuito: *Stone* 2092)
 aduat (Nomwin: *Evans* 1078, 1136)
 atuat (Nomwin: *Fosberg* 24581)
 adudud (Truk: Hosokawa, 1937; Glassman, 1953)
 aduut (Truk: *Anderson* 737)
 atiwöt (Truk: St. John, 1948)
 atuat (Truk: *Pelzer* 31, 32; Krämer, 1937; St. John, 1948; Glassman, 1953)
 atuet (Truk: *Anderson* 737)
 atuot (Truk: *Fosberg* 24641; St. John, 1948)
 atuut (Truk: *Anderson* 764)
 atuwat (Truk: Hosokawa, 1937)
 eadiat (Truk: Glassman, 1953)
 ëadiat (Truk: St. John, 1948)
 ötöjöt (Truk: *Wong* 115)
 etiet (Namoluk: *Marshall* 33)
 atūüt (Lukunor: *Anderson* 2151)
 atiut (Satawan: *Anderson* 946)
 atiwüt (Satawan: *Anderson* 946)
 atuat (Satawan: *Anderson* 1016)
 atuöt (Satawan: *Anderson* 1016)
 aigimea (Nukuoro: *Carroll* 15, 18)
 siritai (Kapingamarangi: *Niering* 537, 631)
 ti ritai (Kapingamarangi: *Fosberg* 26083)
 ahtu-guaht (Ant: Glassman, 1953)
 ingkah (Ponape: Glassman, 1952, 1953)
 ngkar (Ponape: *Fosberg* 26329)

ngkau (Ponape: St. John, 1948)
 ñkau (Ponape: *Bascom 138*)
 unkaau (Ponape: Hosokawa ms.)
 unka (Ponape: *Hosaka 3510*)
 unkehr (Ponape: *Glassman 2399*; Glassman, 1952, 1953)
 morishish (Mokil: Glassman, 1953, *Glassman 2593*)
 kisuwell (Pingelap: *St. John 21483*, Glassman, 1953)
 kīsuwēll (Pingelap: St. John, 1948)
 agaia (Kusaie: St. John, 1948; Glassman, 1953)
 eekeh (Kusaie: Glassman, 1953)
 ekeh (Kusaie: St. John, 1948)
 ikya (Kusaie: Hosokawa, ms.)
 builibuilikāth (Marshall Is.: St. John, 1948)
 marajej (Marshall: St. John, 1948)
 margiwewe (Marshall Is.: St. John, 1948)
 margkiwewe (Marshall Is.: St. John, 1948)
 margrewe (Marshall Is.: von Prowazek, 1913)
 marijetch (Marshall Is.: St. John, 1948)
 marjatch (Marshall Is.: St. John, 1948)
 markeue (Marshall Is.: St. John, 1948)
 markibuebue (Marshall Is.: St. John, 1948)
 morigides (Marshall Is.: St. John, 1948)
 morijetch (Marshall Is.: St. John, 1948)
 mojej (Ujelang: *Fosberg 34171*)
 marguegue (Lae: *Fosberg 34061*)
 margueue (Lae: *Fosberg 34061*)
 norojes (Kwajalein: *Bryan in 1944*)
 marajej (Likiep: *Fosberg 27003*)
 marijetch (Aur: *St. John 21396*)
 markueue (Ailinglapalap: *Fosberg 26820*)
 marijatch (Majuro: St. John, 1948)
 markebwebwe (Majuro: *Stone 954*)
 marjej (Arno: *Anderson 3663*; *Stone 1059*)
 markūbwebwe (Arno: *Anderson 3663*)
 markebuebue (Jaluit: *Fosberg & Sacht, 1962*; Volkens 1903
 citing Schwabe, Schnee)
 markuwewe (Jaluit: *Fosberg & Sacht, 1962*)
 merguebit (Jaluit: *Fosberg & Sacht, 1962*)
 mērgwēbīt (Jaluit: Volkens, 1903 citing Schwabe & Schnee)
 mergwēbit (Jaluit: Schumann & Lauterbach, 1901)
 mērgwēbīt (Jaluit: Engler, 1897)
 mer kueue (Jaluit: *Fosberg 26693*)
 mōrēdjēt (Jaluit: Volkens, 1903 citing Schwabe, Schnee)
 moredjit (Jaluit: *Fosberg & Sacht, 1962*)
 kaura (Gilbert Is.: Luomala, 1953)
 te kaura ni banaba (Gilbert Is.: *Catala 76*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

CAROLINE ISLANDS.—s.l., *Moore 81* (US).

Palau: s.l., *Ledermann 14179* (K); *Richardson 108* (US). Kayangl: Ngajangel I., *Gressitt 30* (US). Babeldaob: Aimion, Monte Ngarua, *Tuyama in 1937* (TI). Koror: *Tuyama in 1939* (TI); *Kanehira 199* (FU); *Kanehira & Okuya s.n.* (FU); Arkamai, *Kanehira & Nisida 25* (FU); Ngermid, *Cheatham 59*

(US); road to Airai Ferry dock, *Fosberg 50619* (US). Ngarakabesang: *Hardy 103* (US, BISH); Ngerksong, reservoir trail, *Hardy 32* (US). Aulupse'el: Risong, Maruker Bay, 10–15 m, *Fosberg 47559a* (US). Ngeanges: Yoo Passage, 1 m, *Fosberg 25812* (US, BISH). Peliliu: *Emmons 93* (US, BISH); Angaur: S side of island, 2–5 m, *Fosberg 21976* (US, BISH, Fo, NY, L); E side of island, 3–5 m, *Fosberg 31992* (US, BISH, Fo).

Sonsorol: Beach, *Salsedo 395* (US); *Berry 21* (US).

Yap: Volkens 1901:477 (citing Volkens 57); near seashore, *Wong 306* (US, BISH); Kanif, *Takamatsu 1920* (BISH); E ridge of Mt. Matade, above Yap Town, 20–40 m, *Fosberg 25575* (US, BISH); oppido Dogol, *Tuyama in 1939* (TI); N of Nimar, 170 m, *Fosberg 46544* (US).

Ulithi: Mogmog I., *Lessa 84* (BISH); 2–4 m, *Fosberg & Wong 25475* (US, BISH, Fo, NY, L); eastern Mogmog, *Knox 834* (US). Asor I., 1–2 m, *Fosberg & Evans 46408* (US). Sorlen I., 0–5 m, *Evans 396* (US, BISH). Pontangeras I., 5 ft [2 m], *Hosaka 3242* (US, BISH). Fasserai I., 2–4 m, *Fosberg 25456* (US, BISH, Fo, NY).

Fais: Yldow, 1 m, *Fosberg 46724* (US).

Eauripik: Eauripik I., 1–2 m, *Fosberg & Evans 47113* (US).

Woleai: Utagal I., 1–2 m, *Wong 42* (US, BISH). Falalis I., 1–2 m, *Fosberg 47005* (US); *Alkire 9* (US). Falalop I., 0–5 m, *Evans 452* (US, Fo).

Faraulap: Faraulap I., 1 m, *Fosberg & Evans 47312* (US).

Ifaluk: *Abbott & Bates 3* (US); Ifaluk I., 2 m, *Fosberg 47209* (US).

Lamotrek: Lamotrek I., 1–3 m, *Fosberg & Evans 46788* (US).

Satawal: 2 m, *Fosberg & Evans 46920* (US).

Puluwat: Puluwat I., Niering 1961:3.

Namonuito: Magur I., Magur village, *Evans 918* (US). Piseras I., 0–3 m, *Evans 897* (US). Ono I., 0–3 m, *Evans 1023* (US). Onari I., 0–3 m, *Evans 961* (US).

Murilo: Ruo I., 3–5 m, *Evans 1184* (US); Murilo I., 0–3 m, *Evans 1226* (US).

Nomwin: Nomwin I., 1–2 m, *Fosberg 24581* (US, BISH); 0–3 m, *Evans 1078* (US). Fananu I., 3–5 m, *Evans 1136* (US).

Truk: s.l., *Pelzer 31* (US), *32* (US); *Koidzumi in*

1915 (TI); *Kamiya* 16 (TI); *Le Guillou* 22 (P) (Archipel d'Hogoleu ou de Roug); mangroves, *Hosokawa* 6499 (A); near seashore, *Wong* 115 (US, BISH). Ile Shix, *Hombron* in 1841 (P, Fo). Moen: *Niering* 792 (US); 3 m, *Fosberg* 24698 (US, BISH); hillside, 600 ft [185 m], *Hosaka* 2699 (US, BISH); vicinity of Moen village, *Anderson* 737 (US, BISH, Fo, NY); 764 (US, BISH, Fo, NY); saddle between Sabuk Peninsula and main part of island, *Fosberg* 24425 (US, BISH). Dublon: (Natsushima) *Takamatsu* 285 (BISH). Eten: *Hallier* 96 in 1903 (HBG, US). Pis: 1-2 m, *Fosberg* 24641 (US, BISH); 3-5 m, *Evans* 847 (US). Romonum: *Stone* 5296 (BISH).

Nama: Anderson, seen in 1950 but not collected.

Losap: Anderson, seen in 1950 but not collected. Losap I., 3-5 m, *Evans* 1344 (US).

Namoluk: Namoluk I., *Anderson* 918 (US, BISH, Fo, NY, L); *Marshall* 33 (US, BISH).

Etal: Anderson, seen in 1950 but not collected.

Lukunor: Lukunor I., *Anderson* 2151 (US, BISH, Fo, NY, L).

Satawan: Moch I., *Anderson* 946 (US, BISH, Fo, NY, L). Ta I., *Anderson* 1016 (US, BISH, Fo, NY, L).

Nukuoro: Nukuoro I., *Dagamanga*, *Carroll* 15 (US), 18 (US).

Kapingamarangi: *Niering* 537 (US). Hare I., 5 ft [2 m], *Hosaka* 3432 (US, BISH); 1 m, *Fosberg* 26083 (US, BISH). Werua I., *Niering* 631 (US).

Ant: Glassman 1953:304, 308.

Ponape: s.l., *Ledermann* 13922 (K); *Bascom* 138 (?) (US); Colonia, *Kanehira* 674 (BISH, FU); Taman, *Takamatsu* 880 (BISH); Langar I., *Glassman* 2399 (US); Jokaj, 300 ft [90 m], *Hosaka* 3510 (US, BISH); S base of Tolenot Peak, peninsula E of mouth of Tawenjakola R., 3 m, *Fosberg* 26329 (US, BISH).

Mokil: Kalap I., *Glassman* 2593 (US, BISH).

Pingelap: *St. John* 21483 (US, BISH).

Kusaie: s.l., *Kanehira* 1317 (NY, FU). Kusaie I., *Rainey* 27 (US); *Moore* 81 (US); Matuutik, *Clarke Ku-10* (US); lower slopes around head of valley S of Lela Harbor, 50-150 m, *Fosberg* 26653 (US, BISH). Lela I., Lela Harbor, 15 m, *Wong* 73 (US, BISH).

MARSHALL ISLANDS.—On all southern islands,

von Prowazek 1913:121. Radack chain: Lessing, 1831:160 (citing Chamisso); Endlicher, 1835:168 (citing Chamisso); Schumann & Lauterbach 1901:600 (citing Chamisso); Volkens 1903:91 (citing Chamisso); s. coll. s.n. (MO); *Chamisso* (K).

Eniwetok: Engebi I., 1-5 m, *Fosberg* 24391 (US, BISH).

Ailinginae: Sifo I., *Fosberg* 36694 (US, BISH, Fo).

Rongelap: Rongelap I., *Taylor* 46-1469 (US, BISH); *Taylor* in 1946 (A).

Ujelang: Ujelang I., *Fosberg* 34171 (US).

Ujae: Ujae I., *Fosberg* 34301 (US).

Wotho: Wotho I., *Fosberg* 34252 (US).

Lae: Lae I., *Fosberg* 34061 (US).

Kwajalein: 2-3 m, *Cameron* 7 (BISH); *Wagner* 3378 (US). Bigej I. (Bennett), 1-3 m, *Fosberg* 26508 (US, BISH). Kwajalein I., 1 m, *Fosberg* 26476 (US, BISH). Torrutj I., *Bryan* in 1944 (BISH).

Ailuk: Marib I., *Fosberg* 33983 (US).

Likiep: Lado I., *Fosberg* 33819 (US); Likiep I., 1-2 m, *Fosberg* 27003 (US, BISH).

Aur: Tabal I., *St. John* 21396 (BISH).

Ailinglapalap: Bikajle I., 1-3 m, *Fosberg* 26820 (US, BISH).

Majuro: Majuro I., observed, St. John, 1951: 286. Uliga I., *Stone* 954 (BISH); islet W of Dalap Island, 1-2 m, *Fosberg* 26918 (US, BISH).

Arno: Ine I., *Anderson* 3663 (US, Fo); *Stone* 1059 (Fo); Mabolen, *Hatheway* 776 (US, BISH, Fo, NY).

Namorik: Jeeruk I., *Stone* 993 (BISH).

Jaluit: Engler, 1897:226; Schumann & Lauterbach, 1901:600; Volkens, 1903:91; s.l., *Koidzumi* in 1915 (TI); *Nakao* in 1941 (KYO); *St. John* 21675 (BISH); Jaluit I., Sydney Pier area, S of Jabor, 1-2 m, *Fosberg* 26693 (US, BISH).

BANABA (OCEAN) I.—Catala, 1957:111.

GILBERT ISLANDS.—Abaiang: *Catala* 76 (P); *Adair* 183 (US).

***Wollastonia biflora* var. *canescens*
(Gaudichaud) Fosberg**

Wollastonia biflora var. *canescens* (Gaudichaud) Fosberg, Smithsonian Contr. Bot. 45, 33, 1980.

Verbesina canescens Gaudichaud, Bot. Voy. Uranie, 463, 1826 [1829].—Safford, Contr. U.S. Nat. Herb., 9:395, 1905.

- Verbesina biflora* sensu Safford, Contr. U.S. Nat. Herb., 9:395, 1905 [non L., Sp. Pl., ed. 2, 1272, 1763].
- Verbesina argentea* Gaudichaud, Bot. Voy. Uranie, 463, 1826 [1829].—Endlicher, Ann. Wien, Mus. Naturgesch., 1:169, 1835.—Schumann & Lauterbach, Fl. Süds., 601, 1901.—Safford, Contr. U.S. Nat. Herb., 9:395, 1905.—Kanehira, Fl. Micron., 468, 1933.
- Wedelia chamissonis* Lessing, Linnaea 6:161, 1831.—Endlicher, Ann. Wien. Mus. Naturgesch., 1:168, 1835.—Schumann & Lauterbach, Fl. Süds., 600, 1901.—Safford, Contr. U.S. Nat. Herb., 9:398, 1905.
- Wedelia biflora* sensu Safford, Contr. U.S. Nat. Herb., 9:398, 1905.—von Prowazek, Deutsch. Marianen, 121, 1913.—Merrill, Phil. Jour. Sci. Bot., 9:154, 1914.—Walker & Rodin, Contr. U.S. Nat. Herb., 30:467, 1949.—Stone, Micronesica, 1:128, 1964; Micronesica, 6:587, 1971. [Non (L.) de Candolle in Wight, Contrib. Bot. Ind., 18, 1834.]
- Wollastonia biflora* sensu Safford, Contr. U.S. Nat. Herb., 9:399, 1905 [non (L.) de Candolle, Prodr. 5:546, 1836].
- Wollastonia scabriuscula* de Candolle ex Decaisne, Nouv. Ann. Mus. Paris, 3:414, 1834 [in part]; Prodr., 5:547, 1836.—Safford, Contr. U.S. Nat. Herb., 9:399, 1905.
- Wollastonia canescens* (Gaudichaud) de Candolle, Prodr., 5:547, 1836.—Safford, Contr. U.S. Nat. Herb., 9:399, 1905.
- Stemmodontia canescens* (Gaudichaud) W. F. Wight in Safford, Contr. U.S. Nat. Herb., 9:377, 1905.—Stone, Micronesica, 1:128, 1964.
- Wedelia canescens* (Gaudichaud) Merrill, Phil. Jour. Sci. Bot., 9:155, 1914.—Safford, Contr. U.S. Nat. Herb., 9:398, 1905 [in synonymy].—Mattfeld, Bot. Jahrb., 62:434, 1929.—Kanehira, Fl. Micron., 468, 1933.—Hosokawa, Trans. Nat. Hist. Soc. Formosa, 24(132):205, 1934.—Kanehira, Enum. Micr. Pl., 431, 1935.—Kitamura, Act. Phyt. Geobot., 10:73-74, 1941.
- Wedelia argentea* (Gaudichaud) Merrill, Phil. Jour. Sci. Bot., 9:155, 1914.—Kanehira, Fl. Micron., 468, 1933.—Hosokawa, Trans. Nat. Hist. Soc. Formosa, 24(132):205, 1934.—Kanehira, Enum. Micr. Pl., 431, 1935.
- Wedelia biflora* var. *canescens* (Gaudichaud) Fosberg, Phytologia 5:291, 1955.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:43, 1975.

Differs from var. *biflora* in being vegetatively much more densely strigose and in its shorter, 1.5-2(-3) mm long, achenes. The density of the pubescence varies considerably.

Known in Micronesia from the Marianas (Maug, Agrigan, Pagan, Alamagan, Guguan, Sarigan, Anatahan, Medinilla, Saipan, Tinian, Rota, Guam); Carolines (Palau).

USES.—It is sometimes used medicinally (Guam: *Fosberg 25338*, *Safford & Seale 1034*). The leaves and roots are boiled and drunk for tuberculosis (Guam: *Evans 723*).

VERNACULAR NAMES.—

- masiksik (Pagan: *Anderson 551, 588*).
- akangkang tasi (Guam: *Evans 723*).
- masigsic (Guam: *Safford & Seale 1034*)
- masigsig (Guam: *Safford, 1905*; von Prowazek, 1913; Stone, 1971; *Fosberg 25338*)
- masigsig chungge (Guam: *Safford, 1905*; Stone, 1971)
- masigsig chunggi (Guam: *Safford & Seale 1019*)
- ngesil (Palau: *Fosberg & Otobed, ms.*)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Gaudichaud, 1829:463; Endlicher, 1835:169; de Candolle, 1836:547; s.l., *Haenke 807* (NY); *Gaudichaud s.n.* (P).

Maug: S central East I., 50 ft [15 m], *Falanruw 2247* (US); East I., *Dickinson & Mersereau 18* (US).

Agrigan: Trail around S end of island, 10-20 m, *Fosberg 31613* (US, BISH, Fo, NY, L); SW coast below 300 ft [90 m], *Falanruw 2170* (US).

Pagan: *Fosberg 31418* (US, BISH, Fo); isthmus, 1 m, *Anderson 551* (US, BISH, Fo, NY); 1 mi [1.6 km] S of pier, W side of island, *Anderson 588* (US, BISH, Fo, NY, L); Tulagi Beach, *Moore 345* (US); Lagona, *Villagomez JV-04* (US).

Alamagan: Vicinity of Asongsong village, 3-15 m, *Fosberg 31708* (US, BISH, Fo); SSW coast, sea level to 200 ft [60 m], *Falanruw 1957* (US).

Guguan: W coast, 200-225 ft [60-70 m], *Falanruw 1823* (US).

Sarigan: *Kanehira 2165* (NY, FU); NW coast, 0-75 ft [20 m], *Falanruw 1791* (US); above village, 150-250 m, *Evans 2395* (US, BISH, Fo, NY, BISH).

Anatahan: NW tip of island, 0-10 m, *Evans 2446* (US, BISH, Fo, NY); beach area, *Falanruw 1659* (US).

Medinilla: *Swedberg, MS 1974*.

Saipan: *Stephens 40* (Fo); *Momose* in 1930 (TI); *Tuyama* in 1937 (TI); *Kanehira 1023* (NY, FU); *Kanehira & Hatusima 4285* (GH, FU); summit of mountain, 1500 ft [460 m], *Kanehira 35* (NY, FU); Maniagassa I., *Holt 51* (US, BISH, Fo); N of Agingan Pt., 1-3 m, *Fosberg 25242* (US, BISH); sea cliffs on Tsukimi Bay, E of Mt. Petosukara, 75 m, *Fosberg 25199* (US, BISH); Bird (Sukimi) I. Beach, *Evans 2330* (US).

Tinian: *Hosokawa 7738* (A); *Okatani 72* (FU); terrace on SE coast, NE of Carolinas (Lalo) Pt.,

60–80 m, *Fosberg 24834* (US, BISH); “yellow Beach” E of Mt. Lasso, 1–10 m, *Fosberg 24911* (US, BISH).

Rota: s.l., *Necker R37* (US); SW side of island, 0–5 m, *Evans 1904* (US); Môtuyon, *Hosokawa 7685* (BISH, A); Sabana, Zyōden, Hanare-koti, *Tuyama 418* (TI); NW coast between Sonson and Tatacho Pt., 2 m, *Fosberg 25135* (US, BISH, Fo, NY).

Guam: Lessing, 1831:161 (citing Chamisso); Decaisne, 1834:414 (citing Haenke); Endlicher, 1835:168 (citing Chamisso and Gaudichaud); de Candolle 1836:547 (citing Haenke); Merrill 1914: 154, 155; s.l., *Safford & Seale 1019* (US); *McGregor 504* (US, BISH, NY, BM); *G.E.S. 456* (US, BISH, NY, BM); *G.E.S. 351* (US, BISH, K); *Nelson 386* (BISH, NY); *Marche 98* (P, Fo); sea cliffs below Yona, *Rodin 582* (US); Tantapalao Pt., 30 m, *Bryan 1216* (BISH); Orote Pt., 65 m, *Bryan 1088* (BISH); Tagachan Beach, *Pedrus 5* (GUAM), *Stone 3988* (GUAM); Agaña, seashore, *Safford & Seale 1034* (US); Mt. Tenjo, *Rodin 541* (US); 1000 ft [305 m], *Johnson, Markley, & Necker 80* (US); 320 m, *Bryan 1112* (BISH); Reconnaissance area, 900 ft [275 m], *Moore 93* (US); coast E of Barrigada, 10–20 ft [3–7 m], *Steere 125* (US, A, BISH); Pati Pt., 160 m, *Necker 354* (US); Facpi Pt., near beach, *Necker 340* (US); Ritidian Pt., 400 ft [120 m], *Hosaka 3109* (US, BISH); Ypao Pt., 100 ft [30 m], *Johnson* in 1945 (US); near shore, *Necker 42* (US); Agfayan Bay, within 100 m of shore, *Necker 132* (US); E coast between Togcha and Talofofu Bays, *Moore 336* (US); Togcha Bay, 1–2 m, *Fosberg 25338* (US); *Moran 4364* (BISH, Fo, UC); Mt. Alutom, E of Sumay 350 m, *Fosberg 25284* (US, BISH); above Anao Pt., *Moran 4549* (US, UC, BISH, Fo); Chalandao Mt., 1 km SE of Jumujong Manglo Mt., 320 m, *Fosberg 35369* (US); just N of Campanaya (Sanagun) Pt., 10 m, *Fosberg 35473* (US, BISH, Fo, NY, L); Tarague Beach, 1–2 m, *Fosberg 35462* (US, BISH); *Anderson 254* (US, BISH, Fo, NY); 0–25 m, *Evans 723* (US); summit of Mt. Lamlam, 400 m, *Anderson 139* (US, BISH, Fo, NY); Tumon Bay, 0–5 m, *Evans 221* (US); Lujuna, 0–10 m, *Evans 1614* (US).

CAROLINE ISLANDS.—Palau: Babeldaob: Arukoron-sogen, *Hosokawa 7026* (BISH). Angaur: NW coast, 30 m, *Fosberg 25917* (US, BISH).

Youngia Cassini

Youngia Cassini, Ann. Sci. Nat., ser. 1, 23:88, 1831.—Babcock & Stebbins, Washington, 1–106, 1937.

Annual, biennial, or perennial herbs, stems often much-branched, or condensed and unbranched; leaves alternate or mostly basal, usually pinnately lobed or parted, base often clasping; inflorescence cymose-paniculate, or glomerate; heads small, involucre narrow, cylindrical to somewhat campanulate, with a single principal series of phyllaries and a series of smaller ones at base; florets yellow, 5–30 all ligulate, ligules truncate, 5-toothed at apex; style branches slender; achenes oblong-linear, slightly beaked, unequally ribbed, slightly compressed; pappus of many capillary bristles in one series.

A small or medium-sized Asiatic (Australian?) genus, with 1 very widely distributed weedy species, which has become well established in the southern Marianas.

Youngia japonica (L.) de Candolle

Youngia japonica (L.) de Candolle, Prodr., 7:194, 1838.—Kitamura, Acta Phytotax. et Geobot., 10(1):74, 1941.—Stone, Micronesica, 2:141, 1967; Micronesica, 6:579, 1971. *Prenanthes japonica* L., Mant., 107, 1767. *Crepis japonica* (L.) Benth., Fl. Hongkong, 194, 1861.—Hosokawa, Jour. Soc. Trop. Agric., 6:669, 1934.

Scapose or subscapose herb with condensed woolly caudex; leaves 5–10, forming a rosette, blades obovate, thin, rounded at apex, narrowed and lyrate-lobed toward base, glabrous above except a few hairs on lower part of midrib, under surface sparsely pilose or tomentulose near base and on midrib, narrowed into a somewhat pilose petiole shorter than or subequal with blade; scapes 1-several, erect, nearly glabrous 2–4 (–10) dm tall, with 1, or rarely more, reduced cauline leaves, similar to basal but smaller, less lobed; stem sparingly paniculately branched above middle, heads glomerate at ends of branches, on short peduncles; involucre glabrous, about 4–5 mm long, of about 8 principal phyllaries, 4–5 reduced ones at base, about 1 mm long, acute or obtuse, scarious margined, erect, spreading at anthesis; corollas 4–6 mm long; achenes lanceolate, reddish brown, about 2 mm long, unequally 10–12

ribbed, hispidulous, apex truncate; pappus white or yellowish white, capillary, scaberulous, caducous, 3–4 mm long.

A pantropical weedy species found in disturbed moist habitats.

It is known in Micronesia from the Marianas (Saipan, Rota, and Guam).

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Saipan: s.l., *Kanehira* 3576 (FU); Tapôtyo-santyô hugin, *Hosokawa* 6727 (BISH, Fo); Charan-Taroho, 700 ft [215 m], *Hosaka* 2999 (US, BISH, Fo, NY); Army Hill, *Courage* 11 (US, Fo); ridge N of Tapotchau peak, 350 m, *Fosberg* 31772 (US, BISH, Fo, NY, L).

Rota: Road to Sabana area, 200–400 m, *Sachet* 1802 (US); 500 m, *Evans* 2114 (US).

Guam: Harmon village, *Stone* 4070 (GUAM); Lujuna, 180 m, *Evans* 1581 (US).

Zinnia L.

Zinnia L., Syst. ed. 10, 1221, 1759 [nom. cons.].

Herbs and small shrubs; leaves opposite, entire; heads radiate, solitary, terminal on branches, involucre of several series of broad scarious-margined phyllaries; receptacle with chaffy bracts; ray flowers pistillate, corollas persistent and falling with achenes; disk flowers perfect; style branches elongate; achenes subtruncate or obtuse, angulate; pappus of 2 awns or teeth, or lacking.

A small American genus, one species of which is a cosmopolitan garden ornamental introduced in Micronesia.

Zinnia elegans Jacquin

Zinnia elegans Jacquin, Coll., 5:152, 1796 [1797].—Luomala, Bishop Mus. Bull., 213:114, 1953.—Fosberg & Sachet, Atoll Res. Bull., 92:37, 1962.—Stone, Micronesica, 6:587, 1971.—Fosberg, Falanruw, & Sachet, Smithsonian Contr. Bot., 22:43, 1975.

Coarse erect herbs to 0.8 m tall, stems striate, especially above, hirsute, sparingly branched; leaves opposite, sessile, ovate to ovate-triangular,

elliptic, or rarely oblong, apex bluntly acute, base cordate, somewhat amplexicaul, palmately 3- to 5-nerved, margins notably scabrous, surfaces slightly so; heads solitary, terminal, peduncles exceeding leaves, notably striate and tending to be swollen or somewhat inflated; involucre broad, bowl-shaped, of 3–4 series of spirally imbricate broad, almost orbicular, obscurely many-nerved phyllaries, their margins black, hispid ciliolate; receptacular bracts with fimbriate appendages; ray florets with showy spatulate ligules, these many nerved, appressed hirtellous, distally glandular, variously colored, rounded to slightly emarginate at apex, disk flowers 5-lobed; achenes flattened, subtrigonous, inner flat, pappus reduced to 2 teeth or lacking.

Native of Mexico, but variously selected and hybridized in cultivation, producing a multitude of color forms and cultivars. Sparingly planted in gardens in Micronesia, not known to be naturalized.

Known in Micronesia from the Marianas (Agri-gan, Guam), Carolines (Ulithi), Marshalls (Kwajalein, Majuro, Jaluit), Gilberts.

USES.—Ornamental.

VERNACULAR NAMES.—

zinnia (English)
mochingel spaïol (Ulithi: *Lessa* 102)
tinia (Gilberts: Luomala, 1953)

GEOGRAPHIC RECORDS AND SPECIMENS EXAMINED

MARIANAS ISLANDS.—Agrigan: Village, 10–20 m, *Fosberg* 31560 (US).

Guam: Stone, 1971:587.

CAROLINE ISLANDS.—Ulithi: Mogmog I., *Lessa* 101 (BISH), 102 (BISH).

MARSHALL ISLANDS.—Kwajalein: Seen growing in pot by Fosberg, 1956, 1958.

Majuro: Seen by Fosberg in 1978.

Jaluit: Jabor I., Fosberg & Sachet, 1962:37.

GILBERT ISLANDS.—Luomala, 1953:114.

Synonyms and Misapplied Names

Adenostemma fastigiatum sensu auct. Micr. See *Adenostemma lanceolatum* Miquel
Adenostemma lavenia sensu auct. Micr. See *Adenostemma lanceolatum* Miquel and *Adenostemma viscosum* Forster pro minore parte

- Adenostemma parviflorum* sensu Kitamura. See *Adenostemma lanceolatum* Miquel
- Adenostemma viscosum* sensu auct. Micr. pro parte. See *Adenostemma lanceolatum* Miquel
- Bidens leucantha* (L.) Willdenow. See *Bidens alba* (L.) de Candolle
- Bidens meyenianus* Walpers. See *Glossogyne tenuifolia* (Labillardière) Cassini ex Lessing
- Bidens pilosa* var. *radiata* Schultz-Bipontinus. See *Bidens alba* (L.) de Candolle
- Bidens tenuifolia* Labillardière. See *Glossogyne tenuifolia* (Labillardière) Cassini ex Lessing
- Blumea laciniata* (Roxburgh) de Candolle. See *Blumea sinuata* (Loureiro) Merrill
- Blumea mollis* sensu auct. Micr. See *Blumea sinuata* (Loureiro) Merrill
- Blumea sericans* sensu Kitamura. See *Blumea hieraciifolia* (D. Don) de Candolle
- Chrysanthemum indicum* sensu auct. Micr. See *Chrysanthemum × morifolium* Ramatuelle
- Coreopsis drummondii* (D. Don) Torrey & Gray. See *Coreopsis basalis* (Dietrich) Blake
- Crassocephalum rubens* sensu Tuyama. See *Crassocephalum crepidioides* (Benth) S. Moore
- Cyanopsis* Blume. See *Vernonia* Schreber at least for Micronesian records
- Cyanopsis pubescens* (Blume) de Candolle. See *Vernonia patula* (Dryander) Merrill
- Cynara cardunculus* var. *scolymus* (L.) Hegi ex Stone see *Cynara scolymus* L.
- Distreptus* Cassini. See *Pseudo-Elephantopus* Rohr
- Distreptus spicatus* (B. Jussieu) Cassini. See *Pseudo-Elephantopus spicatus* (B. Jussieu) Vahl
- Eclipta erecta* L. See *Eclipta alba* (L.) Hasskarl
- Eclipta prostrata* sensu Safford, Stone. See *Eclipta alba* (L.) Hasskarl
- Elephantopus carolinianus* sensu auct. See *Elephantopus mollis* Humboldt, Bonpland, & Kunth for Guam record
- Elephantopus scaber* sensu auct. Micr. See *Elephantopus mollis* Humboldt, Bonpland, & Kunth
- Elephantopus spicatus* B. Jussieu in Aublet. See *Pseudo-Elephantopus spicatus* (B. Jussieu) Vahl
- Elephantopus tomentosus* sensu Kitamura, Koster. See *Elephantopus mollis* Humboldt, Bonpland, & Kunth
- Emilia javanica* sensu auct. Micr. See *Emilia fosbergii* Nicolson
- Erechtites missionum* sensu Tuyama. See *Crassocephalum crepidioides* (Benth) S. Moore
- Erigeron albidus* (Willdenow ex Sprengel) Gray. See *Conyza bonariensis* (L.) Cronquist
- Gaillardia lanceolata* sensu Bryan. See *Gaillardia pulchella* Fougereux
- Gynura* Cassini. See *Crassocephalum* Moench for widespread weedy species
- Matricaria chamomilla* sensu Blanco, Safford. See *Chrysanthemum × morifolium* Ramatuelle
- Mikania micrantha* Humboldt, Bonpland, & Kunth. See *Mikania scandens* (L.) Willdenow
- Pluchea carolinensis* sensu Moore et al. See *Pluchea symphytifolia* (Miller) Gillis
- Pluchea odorata* sensu auct. Micr. See *Pluchea symphytifolia* (Miller) Gillis
- Pluchea purpurascens* de Candolle. See *Pluchea indica* (L.) Lessing
- Pyrethrum* Zinn. See *Chrysanthemum* L.
- Pyrethrum indicum* sensu Safford. See *Chrysanthemum × morifolium* Ramatuelle
- Pyrethrum sinense* sensu Safford. See *Chrysanthemum × morifolium* Ramatuelle
- Senecio* L. See *Pseudogynoxys* (Greenman) Cabrera for Micronesian species
- Senecio chenopodioides* Humboldt, Bonpland, & Kunth. See *Pseudogynoxys chenopodioides* (Humboldt, Bonpland, & Kunth) Cabrera
- Senecio confusus* Britten. See *Pseudogynoxys chenopodioides* (Humboldt, Bonpland, & Kunth) Cabrera
- Spilanthes acmella* sensu auct. plur. See *Spilanthes iabadicensis* A. H. Moore
- Spilanthes paniculata* sensu Glassman. See *Spilanthes iabadicensis* A. H. Moore
- Stemmodontia* Cassini. See *Wollastonia* de Candolle ex Decaisne for Micronesian species
- Stemmodontia biflora* (L.) W. F. Wight. See *Wollastonia biflora* (L.) de Candolle
- Stemmodontia canescens* (Gaudichaud) W. F. Wight. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Verbesina* L. See *Wollastonia*, *Eclipta*, and *Synedrella* for Micronesian records
- Verbesina argentea* Gaudichaud. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Verbesina biflora* L. See *Wollastonia biflora* (L.) de Candolle
- Verbesina biflora* sensu Safford. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Verbesina canescens* Gaudichaud. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Verbesina nodiflora* L. See *Synedrella nodiflora* (L.) Gaertner
- Verbesina strigulosa* Gaudichaud. See *Wollastonia biflora* (L.) de Candolle
- Vernonia chinensis* sensu Endlicher, Schumann, & Lauterbach. See *Vernonia patula* (Dryander) Merrill
- Vernonia cinerea* var. *parviflora* (Reinwardt ex Blume) de Candolle. See *Vernonia cinerea* (L.) Lessing
- Vernonia parviflora* Reinwardt ex Blume. See *Vernonia cinerea* (L.) Lessing
- Vernonia pyrropappi* sensu Kanehira. See *Vernonia cuneata* Lessing
- Vernonia villosa* (Blume) Wight in Safford. See *Vernonia patula* (Dryander) Merrill
- Wedelia* Jacquin. See *Wollastonia* de Candolle ex Decaisne for most Micronesian plants
- Wedelia argentea* (Gaudichaud) Merrill. See *Wollastonia biflora*

- var. *canescens* (Gaudichaud) Fosberg
- Wedelia aristata* Lessing. See *Wollastonia biflora* (L.) de Candolle
- Wedelia biflora* (L.) de Candolle. See *Wollastonia biflora* (L.) de Candolle
- Wedelia biflora* sensu Safford. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wedelia biflora* var. *canescens* (Gaudichaud) Fosberg. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wedelia canescens* (Gaudichaud) Merrill. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wedelia chamissonis* Lessing. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg for Guam records
- Wedelia strigulosa* (de Candolle) K. Schumann. See *Wollastonia biflora* (L.) de Candolle
- Wollastonia biflora* sensu Safford. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wollastonia canescens* (Gaudichaud) de Candolle. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wollastonia scabriuscula* de Candolle. See *Wollastonia biflora* (L.) de Candolle
- Wollastonia scabriuscula* sensu Safford. See *Wollastonia biflora* var. *canescens* (Gaudichaud) Fosberg
- Wollastonia strigulosa* (Gaudichaud) de Candolle. See *Wollastonia biflora* (L.) de Candolle

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Corrigenda

In *Smithsonian Contributions to Botany*, number 45, issued 13 June 1980, on page 26, the first head ***Callicarpa lamii* Hosokawa** should read ***Callicarpa elegans* Hayek**.