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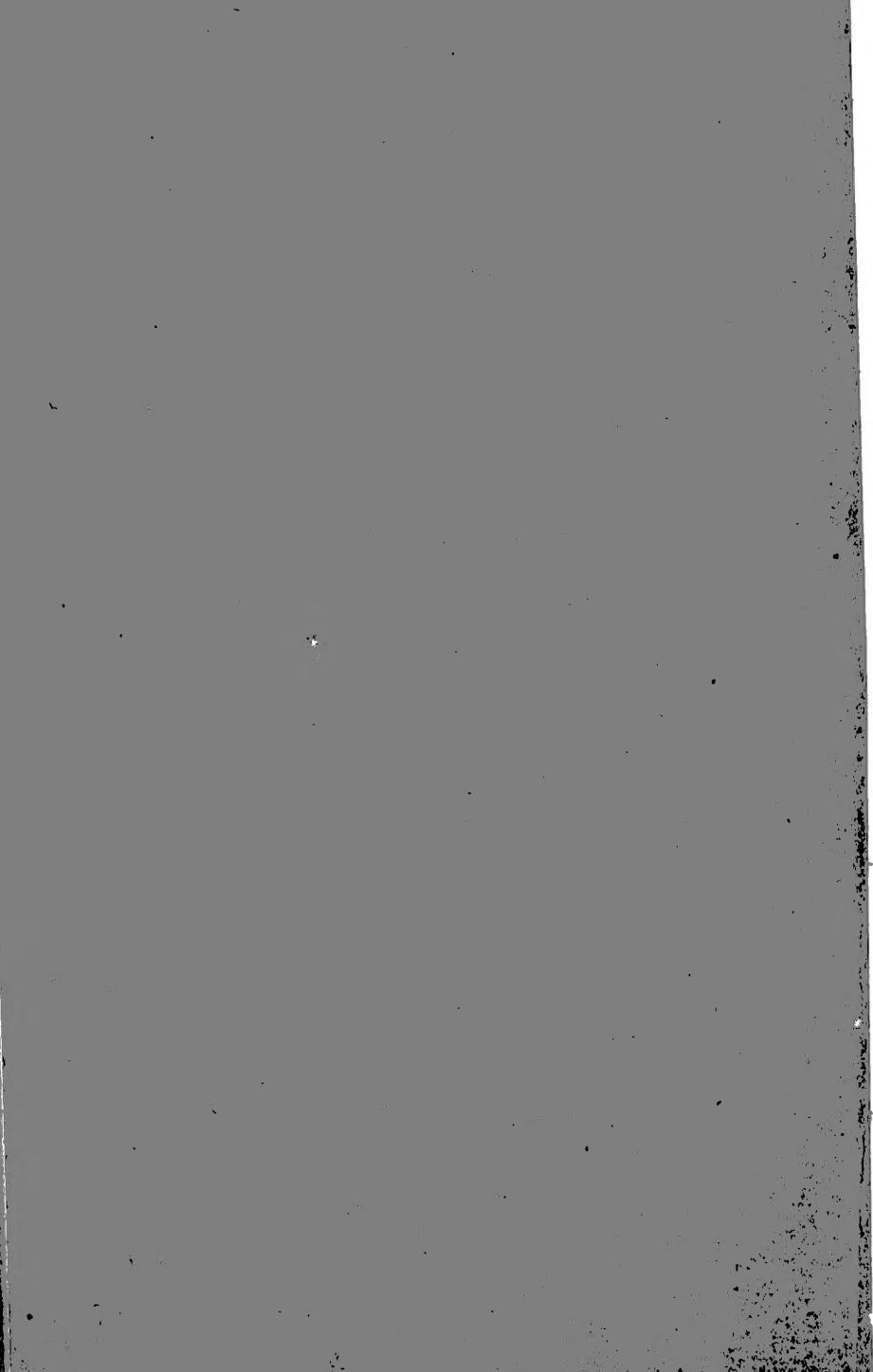
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REGIONAL VEGETATION LITERATURE. I. CONNECTICUT

Frank E. Egler

Introduction

Vegetation, popularly referred to as the plant carpet of the world, has been the source of folklore, legend, and common knowledge ever since man first distinguished between forest and grassland. The scientific study of this vegetation, however, is of very recent date, and cannot yet be regarded as organized into a distinct and independent branch of science. The dichotomous division of botany into the study of flora and vegetation, respectively, was formulated only a century ago by Thurmann ('49) who thus called attention to the vegetational aspects of general plant geography. Subsequently, several schools of plant sociology developed in continental Europe. In England, the recognition of vegetation as a field of study is now well accepted by the plant scientists, as expressed by Tansley and Chipp ('26) and others. In North America, although botanical descriptions of the vegetation date from at least 1899 (Cowles, '99), a clearcut delineation of the differences between flora and vegetation remained unexpressed, perhaps until as late as 1914 (Harper, '14). Even then, the differences between these concepts went almost unheeded in the welter of research designed to prove the assumptions and postulates of an environmental determinism. In the opinion of the author, the resulting science of ecology has done more perhaps to erase than to demarcate the distinctions between flora and vegetation. Whether or not this erasure is desirable will be decided more by future developments than by present attitudes. Since the middle 1930's, modern forestry, range management, wildlife management, soil conservation, and watershed management have come into existence. As applied sciences, they have recognized the need for accurate, detailed, and practicable inventories of regional vegetation, and are developing new techniques and methods of their own. The vegetation science of the future may point to its diverse origins from these many fields of study.

The annotated bibliography which follows covers the selected field of vegetation study as indicated above; it is not believed to be coextensive with American plant ecology (Egler, '42). The purpose of the bibliography is to assemble the principal contributions concerning local regional vegetation, and to indicate the extent and coverage of the modern scientific literature. It is not to be considered as a guide to

papers in floristics and plant taxonomy, but to studies of plant communities and of the mosaics of plant communities which constitute vegetation. The annotations refer primarily to matters of geographic vegetational interest, and not to other information which may be present. Subsequent publications in this series will deal with additional political or regional units. In this connection, I cordially invite communications from others who may be interested in preparing units of this bibliography, which will ultimately cover at least the entire United States.

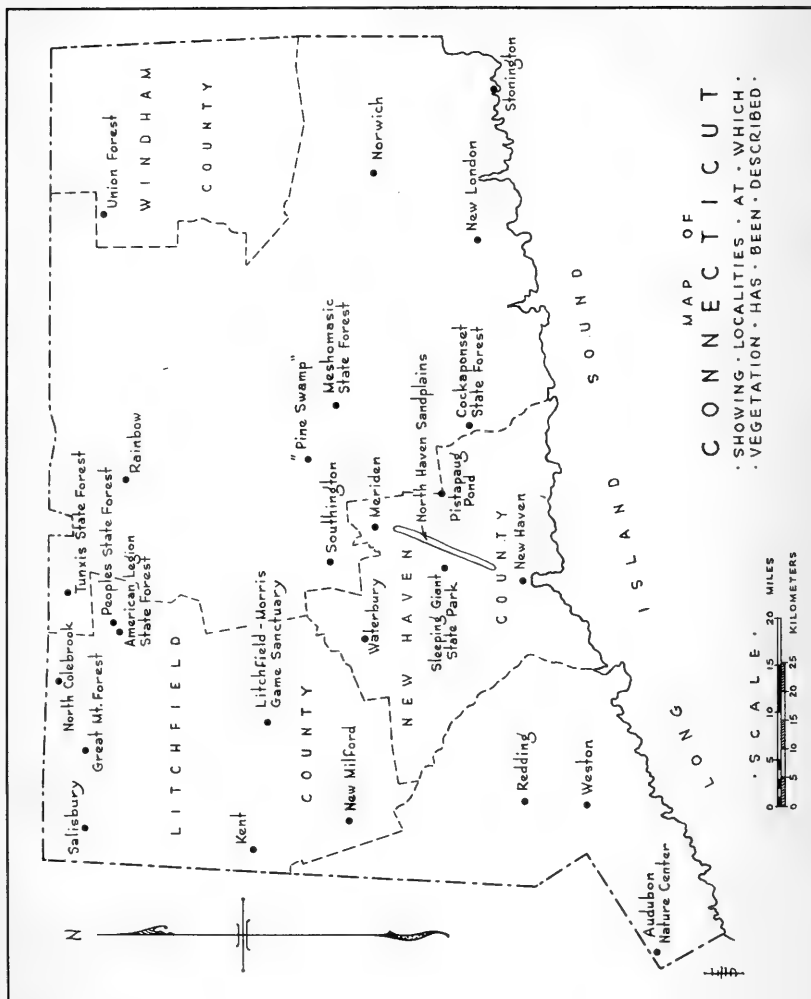
No claim is made for bibliographic completeness, and considerable restriction is exercised in the choice of references for inclusion. Recent investigations on the nature and structure of plant communities and on their floristic and successional relationships are given preference. Papers are referred to a local area on the basis of included data, even though the authors may have generalized from such data to cover wider territory. Annotated floristic lists for small tracts may be included if such annotations serve as a description of the local vegetation. Purely taxonomic studies are not entered, except insofar as these may serve as handbooks or references for the vegetation scientist, such as state floras. State lists of algae and fungi are not included, for although these plants are components of the vegetation, they are not conventionally included in such research as this bibliography covers. Sketchy descriptive accounts by travelers and naturalists are not included, unless these are of historical interest, or are the only information available for their regions. County soil surveys of the federal government are not listed, since their vegetation descriptions are generally abstracted from other sources. Soil Conservation Service land-use reports are not considered unless they contain original descriptions of the natural vegetation. General botanical papers which cover several states or other large areas, and the data of which cannot be localized, are usually not entered. Treatments of edible, medicinal, poisonous, and otherwise useful plants do not come under the category of vegetation studies. Purely agricultural, horticultural, nursery, and forest-plantation studies fall outside the scope of this bibliography, unless they report investigations of semi-natural wild societies and naturally invading shrub and tree populations. For regional taxonomic studies, one may consult the excellent bibliography of S. F. Blake and A. C. Atwood ('42). Although that Guide contains many publications of vegetational importance, the annotations are written primarily from a floristic point of view. The following bibliography includes the majority of citations in that Guide, with annotations for the student of vegetation; it may not include the purely taxonomic

publications, especially if they are old unannotated lists, or have been superseded by more recent studies.

The arrangement of materials for each state includes the following sections: (1) a map of the state, showing localities at which vegetation has been described; (2) botanical bibliographies, if existing; (3) state floras for lichens, bryophytes, pteridophytes, and spermatophytes; (4) local vegetation literature, arranged by localities; and (5) local vegetation literature, arranged by authors, in simplified form, with cross-references to the previous section. The fourth section lists first those studies of general state-wide scope, arranged chronologically by date; then the local papers. The local papers are listed alphabetically by the localities shown on the map. Each locality (except for counties) is followed by a citation placing that locality on the standard topographic map of the U. S. Geologic Survey (scale 1/62,500; the 15-min. series). The citation consists of the name of the quadrangle, and the number of the sub-quadrangle. Each sheet normally contains nine sub-quadrangles, here numbered from left to right, and from top row to bottom row. Under each locality, the vegetation references are arranged chronologically by years.

Literature Cited in Introduction

- Blake, S. F., and A. C. Atwood. 1942. Geographical Guide to floras of the world. U. S. Dept. Agric. Misc. Publ. 401.
- Cowles, H. C. 1899. The ecological relations of the vegetation on the sand dunes of Lake Michigan. Bot. Gaz. 27:95-116, 167-202, 281-308, 361-391.
- Egler, F. E. 1942. Vegetation as an object of study. Philosophy of Science 9:245-260.
- Harper, R. M. 1914. Geography and vegetation of northern Florida. Pp. 163-437 in Fla. State Geol. Surv. 6th Ann. Rept.
- Tansley, A. G., and T. F. Chipp. 1926. Aims and methods in the study of vegetation. London.
- Thurmann, J. 1849. Essai de phytostatique appliqué à la chaîne du Jura. 2 vols. Berne.



I. CONNECTICUT

Our knowledge of the vegetation of Connecticut is still in its early stages of scientific description. Despite the long period of human settlement of this state, its long botanical history, the high development of its forestry research, and the intensity of recreational development, it cannot be said that the vegetation of any local area has been completely and monographically described according to the scientific techniques now available. The vegetational knowledge that we possess, as portrayed in the literature listed below, is derived largely from two sources: (1) from various floristic studies by the taxonomic botanist, and (2) from specific ecologic problems investigated by the foresters. Only four publications are immediately concerned with the vegetation: (1) Nichols' (1913-1920) work on the vegetation of Connecticut, based on original field investigations; and the papers of his associates (2) Steiner's 1934 study of the East Haven tidal-marshes, (3) Olmsted's 1937 investigation of the North Haven sandplains, and (4) Egler's 1940 study of the Berkshire Plateau of Massachusetts and Litchfield County, Connecticut. This meager background indicates the great need for adequate monographic studies that will serve not only the vegetation scientist, but also the forester, wildlife manager, soil conservationist and recreationist.

The author is especially indebted to the following for important comments on the manuscript of this paper: J. R. Hansbrough (U. S. Dept. Agric., New Haven), R. P. Hunter and J. S. Bishop (Conn. Bd. of Fisheries and Game), R. Kienholz (Conn. Forestry Dept.), H. A. Lunt (Conn. Agric. Exp. Sta.), H. J. Lutz (Yale Sch. of Forestry), H. R. Raup (Harvard Univ.), and G. S. Torrey (Univ. of Conn.). The map of Connecticut was drawn by L. E. Partelow, Weedsport, N.Y.

State Floras

LICHENES

1926. Evans, A. W., and R. Meyrowitz. Catalogue of the lichens of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 37. 49 pp.

An annotated list of 301 plants. No keys.

BRYOPHYTA

1908. Evans, A. W., and G. E. Nichols. The bryophytes of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 11. 203 pp. An annotated list of 387 plants. With keys. A bibliography of 81 titles.

PTERIDOPHYTA AND SPERMATOPHYTA

1910. Graves, C. B., E. H. Eames, C. H. Bissell, L. Andrews, E. B. Harger, and C. A. Weatherby. Catalogue of the flowering plants and ferns of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 14. 569 pp.
An annotated list of 2228 plants. No keys.
1929. Mattoon, W. R., and A. F. Hawes. Forest trees of Connecticut. Conn. State Park and Forest Comm. 56 pp.
A dendrologic handbook. No keys. Replaces earlier eds.
1930. Harger, E. B., C. B. Graves, E. H. Eames, C. A. Weatherby, R. W. Woodward, and G. H. Bartlett. Additions to the flora of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 48. 94 pp.
An annotated list, increasing the number of plants to 2511. No keys.
1931. Eames, E. H. Further additions to the Connecticut flora. Rhodora 33:167-170.
A supplement to Harger et al. 1930.

Vegetation Literature Arranged by Localities

GENERAL

1905. Spring, S.N. The natural replacement of white pine on old fields in New England. U. S. Dept. Agric. Bull. 63. 32pp. Origin and distribution of old-field white-pine stands, with folded map.
1906. Hawes, A. F. Chestnut in Connecticut and the improvement of the woodlot. Conn. Agric. Exp. Sta. Bull. 154. 41pp. Includes data on role of chestnut in Connecticut vegetation on growth of chestnut, and on density of species in chestnut stands. Of historical interest.

1907. Schwartz, G. F. The sprout forests of the Housatonic Valley of Connecticut. Forestry Quarterly 5:121-153.
Sample-plot data for lower, middle, and upper slopes; western Connecticut. Chestnut data historically interesting.
1907. Hawley, R. C. Treatment of hardwood lands in southwestern Connecticut. Forestry Quarterly 5:283-295.
Includes tables showing composition of typical stands.
1912. Frothingham, E. H. Second growth hardwoods in Connecticut. U. S. Dept. Agric. For. Serv. Bull. 96. 70 pp.
Includes discussions of forest types, yield tables involving chestnut, and effects of thinnings.
1913. Nichols, G. E. Summer evaporation intensity as a determining factor in the distribution of vegetation in Connecticut. Bot. Gaz. 56:143-152.
A correlation of summer evaporation rates with vegetation regions.
1913. Nichols, G. E. The vegetation of Connecticut. I. Phytogeographical aspects. Torrey 13:89-112.
Floristic-geographic aspects. The first of seven articles, together comprising the best available state-wide survey.
For article II, see North Colebrook.
1914. Nichols, G. E. The vegetation of Connecticut. III. Plant societies on uplands. Torrey 14:167-194.
A general treatment, with emphasis on succession.
1915. Nichols, G. E. The vegetation of Connecticut. IV. Plant societies in lowlands. Bull. Torrey Bot. Club. 42: 169-217.
A general treatment, with emphasis on succession.
1916. Moss, A. E. A forest survey of Connecticut. 39th Rept. Conn. Agric. Exp. Sta., for 1915:197-232.
General notes on common upland vegetation types.
1916. Nichols, G. E. The vegetation of Connecticut. V. Plant societies along rivers and streams. Bull. Torrey Bot. Club 43:235-264.
A general treatment of various habitat types.
1920. Nichols, G. E. The vegetation of Connecticut. VI. The plant associations of eroding areas along the sea coast. Bull. Torrey Bot. Club 47: 89-117.
A general treatment of various habitat types.

1920. Nichols, G. E. The vegetation of Connecticut. VII. The plant associations of depositing areas along the sea coast. Bull. Torrey Bot. Club 47: 511-548.
A general treatment of stony, sandy, and muddy habitats.
1924. Merrill, P.H., and R. C. Hawley. Hemlock; its place in the silviculture of the southern New England forest. Yale Univ. Sch. For. Bull. 12. 68 pp.
Includes discussion of hemlock in oak-hickory region; silvicultural, fire, and grazing effects; map of sprout-hardwood region in Connecticut and adjacent states.
1926. Nichols, G. E. Connecticut (Natural Areas and Regions). Pp. 326-330 in Naturalist's Guide to the Americas, V. E. Shelford, ed., Baltimore, Williams & Wilkins.
Brief description, with conspectus of 23 areas of notable vegetation, 11 of which are in state parks.
1927. Forbush, E. H. Birds of Massachusetts and other New England states. Mass. Dept. Agric. 3 vols., 461 pp.
Containing "The faunal areas of New England", vol. II, pp. xviii-xxiii, with map of Canadian, Transition, and Carolinian life zones.
1932. Lunt, H. A. Profile characteristics of New England forest soils. Conn. Agric. Exp. Sta. Bull. 342. 55th Rept. Conn. Agric. Exp. Sta., for 1931:739-836.
Analyses of 44 soils from specific localities in Connecticut and New Hampshire, and correlations with forest types.
1933. Hawes, A. F. The present condition of Connecticut forests. Hartford: State Forester. 78 pp.
General information on current conditions, including types and age classes. Analysis of trees mentioned in original Salisbury Proprietor's Records, by D. J. Warner, p. 25. Folded colored maps of Litchfield and Windham counties, dated 1931.
1934. Matthies, K. compiler. Trees of note in Connecticut. Conn. D. A. R., Inc. 34 pp.
Separate discussions of individual historic trees; several, part of original vegetation; with map showing locations.
1935. Bromley, S. W. The original forest types of southern New England. Ecological Monog. 5:61-89.
Interpretations of pre-colonial forests, emphasizing frequent fires. With maps of principal forest regions and certain forest types.

1935. Goodwin, G. G. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53. 221 pp.
Includes discussion and map of life zones of the state.
1937. Raup, H. M. Recent changes of climate and vegetation in southern New England and adjacent New York. Jour. Arnold Arboretum 18:79-117.
Interpretations of pre-colonial oak-chestnut-hickory forests, by earlier warmer and drier climate.
1938. Kienholz, R., and C. B. Bidwell. A survey of diseases and defects in Connecticut forests. Conn. Agric. Exp. Sta. Bull. 412: paged as 489-559.
Disease incidence, based on sample-plot data of 1256 plots in 12 state forests, which included 98,000 trees.
1939. Hawes, A. F. Hurricane damaged forests still an important state asset. (Conn. Forest Rehabilitation Committee.) 24 pp.
With discussion of 1938 hurricane, and damage to species and types in various parts of the state.
1939. Lunt, H. A. Soil characteristics, topography and lesser vegetation in relation to site quality of second-growth oak stands in Connecticut. Jour. Agric. Res. 59:407-428.
Second-growth oak communities at 76 localities, and associated conditions of floristic composition and site.
1939. Moss, A. E. When it rained salt water. American Forests 45:414,432.
Effects of salt spray from 1938 hurricane on coniferous species, to distances of 45 miles inland.
1940. Raup, H. M. Old field forests of southeastern New England. Jour. Arnold Arboretum 21:266-273.
Traces division between southern old-field red-cedar gray-birch community and northern old-field white-pine, and their corresponding general-upland forests.
1944. Meyer, W. H., and R. Kienholz. Volume tables for Connecticut hardwoods. Yale Univ. Sch. For. Bull. 54. 58 pp.
Detailed study of tree volume, based on data from 3868 trees of 26 species.
1946. Bishop, J. S. and G. P. Spinner. Quantities of weed seed produced in Connecticut cornfields. Jour. Wildlife Management 10:300-303.
Includes data on occurrence of eight weeds, based on 20 plots in 20 fields located throughout the state.

1946. Conn. Forest and Park Assoc. Connecticut Walk Book, 3 ed. Conn. Forest and Park Assoc. Publ. 36. 149 pp.
With descriptions of all trails, and 19 trail maps, including maps of many state forests. An indispensable adjunct.

AUDUBON NATURE CENTER (Stamford Quadr. 4)

- n.d. (rec'd 1946). National Audubon Society of Greenwich. Audubon Nature Center. National Audubon Society of Greenwich. Folder.
General information, with maps showing trails. The area a 280-acre tract used for nature study education, and site of vegetation studies in progress.

COCKAPONSET STATE FOREST (Guilford Quadr. 3,6; Saybrook Quadr. 1,4)

1931. Hicock, H. W., M. F. Morgan, H. J. Lutz, H. Bull, and H. A. Lunt. The relation of forest composition and rate of growth to certain soil characters. Conn. Agric. Exp. Sta. Bull. 330. 54th Rept. Conn. Agric. Exp. Sta. for 1930:671-750.
Soil and vegetation analysis of four tracts, and correlations between vegetation and ten soil types.

1941. Conn. Forestry Dept. Cockaponset State Forest. Conn. Forestry Dept. Folder.
Map, with insets, and notes on roads and trails.

GRANBY (Granby Quadr. 3; east of Tunxis Forest)

- n.d. (pre-1901). Holcomb, I. Native trees, shrubs, and woody vines growing in the vicinity of Granby, Conn. Granby: the author. One leaf.
An unannotated list of 144 plants.

GREAT MT. FOREST (Sheffield Q.9; Cornwall Q.3). See also NORFOLK.

1944. Lutz, H. J., and H. H. Chapman. Injuries to young tree trunks from antler rubbing by deer. Jour. Wildlife Management 8:80-81.
Data from 500 quarter-acre plots. The Forest is a privately owned 5500-acre tract, used by Yale Forest School.

KENT (New Milford Quadr. 1)

1900. Averill, C.K. The distribution of certain trees and shrubs in western Connecticut. Rhodora 2: 34-38.
Species distributions in the Housatonic Valley, mainly at New Milford and Kent.

LITCHFIELD (Waterbury Q. 1; no. of Litchfield-Morris Sanctuary)

1822. Brace, J. P. List of plants growing spontaneously in Litchfield and in its vicinity. Amer. Jour. Sci. 4: 69-86, 292-309.
A list, with comments on occurrences.

LITCHFIELD COUNTY

1884. Underwood, L. M. The Pteridophyta of Litchfield Co., Ct. Bull. Torrey Bot. Club 11:7-8.
An unannotated list of 43 plants.
1909. Hawes, A. F., and R. C. Hawley. Forest survey of Litchfield and New Haven counties. Conn. Agric. Exp. Sta. Bull. 162. 47 pp.
Recognizes three forest types, and includes town-by-town summary of forest conditions.
1933. See map in General. 1933. Hawes.
1940. Egler, F. E. Berkshire Plateau vegetation, Massachusetts. Ecological Monog. 10:145-192.
Includes mapping and description of northern vegetation in Litchfield County.

LITCHFIELD-MORRIS GAME SANCTUARY (Waterbury Quad. 1). See also

LITCHFIELD.

1942. Garin, G. I. Distribution of roots of certain tree species in two Connecticut soils. Conn. Agric. Exp. Bull. 454: paged as 97-167.
Conditions in two soil types, for five species, in plantations, at Peoples State Forest and Litchfield-Morris G.S.
- n.d. (1946, fide Dwyer). Dwyer, J. D. Check list of the ferns and flowering plants of the Litchfield-Morris Game Sanctuary, Litchfield, Connecticut. St. Bd. Fisheries & Game. 56, 20 pp.
Modern annotated list of 800 plants. Area of 4000 acres owned and administered by White Memorial Foundation for multiple purposes, and used as a game sanctuary by the state. The paper is mimeographed.

MERIDEN (Meriden Quadr. 9)

1885. Leonard, E. J. Catalogue of the phaenogamous and vascular cryptogamous plants found growing in Meriden, Connecticut. Trans. Sci. Assoc. Meriden 1:1-40.

An unannotated list of 749 plants; no keys.

1887. Kendrick, E. B. Additional plants found growing in Meriden, Conn., since issue of Catalogue in 1885. Trans. Sci. Assoc. Meriden 2:54-57.

An unannotated supplement to Leonard 1885; no keys.

1889. Davis, C. H. S. A list of the forest trees and shrubs to be found in Meriden, Connecticut. Trans. Sci. Assoc. Meriden 3:46-78.

An unannotated list of 143 plants; supplement to Leonard 1885 and Kendrick 1887; no keys.

1900. Andrews L. A list of the flowering plants and higher cryptogams growing upon the summit of Meriden Mountain, Connecticut. Southington: the author. 16 pp.

A list of 287 plants, with vegetation notes. Meriden Mt. now called West Peak (Meriden Quadr. 8).

1901. Andrews L. Flowering plants and higher cryptogams growing upon the summit of Meriden Mountain. Pp. 349-357 in Rept. Board Educ. State Conn., for 1901.

A republication of Andrews 1900.

MESHOMASIC STATE FOREST (Middletown Quadr. 6)

1914. Filley, W. O., and A. E. Moss. A preliminary working plan for the Portland (Meshomasic) State Forest. Pp. 393-419 in Conn. Agric. Exp. Sta. Ann. Rept. for 1913.

Includes brief descriptions of five forest types, with topographic maps.

1917. Haasis, F. W. Dying of young trees in circles about anthills. Jour. For. 15:763-769.

Dying correlated with fungous infections in the trees.

1927. Korstian, C. F., and P. W. Stickel. The natural replacement of blight-killed chestnut in the hardwood forests of the northeast. Jour. Agric. Res. 34:631-648.

Changes in density and basal area at specific localities in Connecticut, New York, and New Jersey.

1931. Hicock, H. W., M. F. Morgan, H. J. Lutz, H. Bull, and H. A. Lunt. The relation of forest composition and rate of growth to certain soil characters. Conn. Agric. Exp. Sta. Bull. 330. 54th Rept. Conn. Agric. Exp. Sta., for 1930: 671-750.

Soil and vegetation analysis of four tracts, and correlations between vegetation and ten soil types.

1944. Lunt, H. A., and H. G. M. Jacobson. The chemical composition of earthworm casts. Soil Science 58:367-375.

Chemical analyses from five areas in Connecticut, including a mixed hardwood forest at Meshomasic State Forest.

NEW HAVEN (New Haven Quadr. 7,8)

1831. (Tully, W., et al.) Catalogue of the phaenogamous plants and the ferns growing without cultivation, within five miles of Yale College, Ct. Extracted from the appendix to Mr. E. Baldwin's History of Yale College. New Haven. 38pp.
An unannotated list. No keys.

1909. Mattoon, W. R. The origin and early development of chestnut sprouts. Forestry Quarterly 7:34-47.

Of historical interest. At Maltby tract, 5 miles west of New Haven.

1920. Hawley, R. C. Guide to the Maltby tract of the New Haven Water Company. New Haven: the author. 17 pp.
With general comments on the vegetation, and descriptions of critical compartments. Area, 5 miles west of New Haven. Forest lands of New Haven Water Co. now known as the Eli Whitney Forest.

1922. Durland, W. D. Results of an experiment in reproducing hardwood stands under the shelterwood method. Jour. For. 20: 869-871.

Volume and reproduction data from four sample plots of upland hardwood, Maltby tract.

1924. Hawley, R. C. Early development of white and red pine plantations. Jour. For. 22:275-281.

Sample plot data, New Haven Water Co. land near New Haven.

1925. Leffelman, L. S., and R. C. Hawley. Studies of Connecticut. The treatment of advance growth arising as a result of thinnings and shelterwood cuttings. Yale Univ. Sch. For. Bull. 15. 52 pp.

Composition and analysis of understory and reproduction, upland hardwood type after cutting. "Near New Haven."

1926. Hawley, R. C., and R. G. Wheaton. Studies of Connecticut hardwoods. The form of hardwoods and volume tables on a form quotient basis. Yale Univ. Sch. For. Bull. 17. 41 pp. Formand volume tables of 22 hardwood species, based mainly on trees "in vicinity of New Haven."
1927. Korstian, C. F., and P. W. Stickel. The natural replacement of blight-killed chestnut in the hardwood forests of the northeast. Jour. Agric. Res. 34:631-648.
Changes in density and basal area at specific localities in Connecticut, New York, and New Jersey.
1929. MacKinney, A. L. Effects of forest litter on soil temperature and soil freezing in autumn and winter. Ecology 10:312-321.
Data from five soil levels, for 1926-27 season.
1933. Stickel, P. W. Drought injury in hemlock-hardwood stands in Connecticut. Jour. For. 31:573-577.
Describes dead and dying hemlock on trap-rock ridges, Saltonstall and North Branford divisions of Eli Whitney For.
1934. Maule, W. L. Comparative values of certain forest cover types in accumulating and retaining snowfall. Jour. For. 32:760-765.
Snow studies in six forest types, including plantations.
1934. Knight, J. B. A salt-marsh study. Amer. Jour. Sci. 28:161-181.
A geologic study of the origin and development of a tidal marsh at Killam's Point, with comments on the vegetation.
1941. Lunt, H. A. Forest lysimeter studies under hardwoods. Conn. Agric. Exp. Sta. Bull. 449: paged as 517-572.
Two-year infiltration studies. Maltby division, Eli Whitney Forest.

NEW HAVEN COUNTY

1878. Berzelius Society. A catalogue of the flowering plants and higher cryptogams growing without cultivation within thirty miles of Yale College. New Haven: Berzelius Society. 71 pp.

A list, including bryophytes; some annotations. With a map of the region.

1909. Hawes, A. F., and R. C. Hawley. Forest survey of Litchfield and New Haven counties. Conn. Agric. Exp. Sta. Bull. 162. 47 pp.
Recognizes three forest types, and includes town-by-town summary of forest conditions.
1913. Hawley, R. C. A working plan for the woodlands of the New Haven Water Company. Yale Univ. Sch. For. Bull. 3. 30 pp.
With brief descriptions of forest types, and map of the holdings of 8000 acres.
1928. Lutz, H. J. Trends and silvicultural significance of upland forest successions in southern New England. Yale Univ. Sch. For. Bull. 22. 68 pp.
Includes descriptions of red-cedar-gray-birch, hardwood, and hemlock-hardwood communities.
1929. Averill, J. L. Factors affecting the reproduction of hardwood forests in southern Connecticut. Jour. For. 27: 55-61.
Discussion of natural and silvicultural factors. Eli Whitney Forest.
1929. Haig, I. T. Colloidal content and related soil factors as indicators of site quality. Yale Univ. Sch. For. Bull. 24. 29 pp.
A correlation study, between soil characteristics and site qualities, from 95 soil pits, in red pine plantations, Eli Whitney Forest.
1930. Hawley, R. C., and W. Maugham. The Eli Whitney Forest. Yale Univ. Sch. For. Bull. 27. 150 pp.
Includes a list of tree species, brief descriptions of six forest types, map of company holdings, cover-type maps in color of Maltby and Saltonstall divisions, and 56 full-page plates.
1934. Bidwell, C. B., and W. C. Bramble. The Strumella disease in southern Connecticut. Jour. For. 32:15-32.
Includes data on frequency of infection, especially on red and black oaks, Eli Whitney Forest.
1934. Steiner, M. Zur Okologie der Salzmarschen der nordöstlichen Vereinigten Staaten von Nordamerika. Jahrbücher für wissenschaftliche Botanik 81:94-202.

A monographic study of the tidal-marshes from Lighthouse Point east for 1.5 miles to South End (East Haven township). Primarily soil and cell-sap analyses.

1935. Lunt, H. A. Forest lysimeter studies under pine. Amer. Soil Survey Assoc. Bull. 16:86-92.
Moisture percolation and nitrogen recovery from lysimeters; red pine plantation, Eli Whitney Forest, near Lake Dawson. For final report, see Lunt 1937.
1937. Lunt, H. A. Forest lysimeter studies under red pine. Conn. Agric. Exp. Sta. Bull. 394: paged as 219-268.
Two- and three-year leaching studies, red pine plantations, Eli Whitney Forest.
1939. Deevey, E. S. Studies on Connecticut lake sediments. Amer. Jour. Sci. 237:691-724.
Pollen analyses, five lakes and bogs within 30 miles of New Haven, with map showing locations.
1943. Hawley, R. C., and H. J. Lutz. Establishment, development, and management of conifer plantations in the Eli Whitney Forest, New Haven, Connecticut. Yale Univ. Sch. For. Bull. 53. 81 pp.
Includes discussion of conifers used for plantations, and of their development stages as vegetation communities.

NEW LONDON (New London Quadr. 5)

1935. Graves, C. B. The nucleus of the arboretum. Pp. 11-16
The Connecticut Arboretum at Connecticut College Bull. 2.
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1934. Lunt, H. A. Distribution of soil moisture under isolated forest trees. Jour. Agric. Res. 49:695-703.

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REDDING (Danbury Quadr. 5,7,8,9)

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SALISBURY (Cornwall Quadr. 1,2)

1903. Bissell, C. H. A botanical trip to Salisbury, Connecticut. Rhodora 5:32-35.

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1903. Phelps, O. P. An hour in a Connecticut swamp. Rhodora 5:196-197.

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Ring studies from 18 trees, and correlations with other New England data.

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Full description of 7,858-acre tract, known as the Union Forest, used for forestry research, education, and practice. Type descriptions, age-class distributions, and growth data. Colored folded map, showing six cover types.

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A NEW ANTHURIUM FROM ARGENTINA

Alex D. Hawkes

Included in a collection of plants recently received from the Argentine for identification and study at The New York Botanical Garden were three members of the Araceae: the cosmopolitan *Pistia stratiotes* L., *Synandropadix vermitoxicus* (Griseb.) Engl., and a dwarf species of *Anthurium* which is evidently undescribed.

We take great pleasure in naming this interesting little plant for its discoverer, Dr. America del Pilar Rodrigo, of La Plata, Argentina.

ANTHURIUM RODRIGOI Hawkes, sp. nov.

Herba terrestris, erecta, parva; rhizoma abbreviata; caudiculo brevi; foliorum lamina elliptico-oblonga usque ad elliptica, acuta vel leviter acuminata, coriacea; petiolo brevi, terete vel leviter conduplicato, crasse ad basin; nervis prominis, adscendentis; pedunculorum foliae aequante vel excedente, erecto, terete; spatha erecta, coriacea sagittato-lanceolata, margine undulato, ad apicem obtuso et conduplicato; spadice erecto, cylindrico, ad apicem attenuato; floribus quadratis.

Terrestrial, erect herb, small for the genus. Rhizome very abbreviated, obscured by numerous fleshy slightly villos roots up to 5 mm in diameter. Stem ca. 2 cm high. Leaves 14.5-19 cm long, rather coriaceous, elliptic-oblong to elliptic, acute to slightly acuminate, 5-6 cm wide near middle, with very undulate margins; petiole very short (1-1.5 cm long and 3-5 mm thick), apparently terete or slightly conduplicate, with a small thickening at the base of the blade; base of leaf equal on each side, very slightly cordate, rounded; median vein strongly raised in the back, 3 mm broad at base, with secondary veins arcuate and ascending and mostly 8 in number. Peduncle erect, terete, equalling or exceeding the leaves, 17.5-19 cm high, 5-6 mm thick near base, narrowing to 2.5 mm at base of spathe, longitudinally furrowed when dry. Spathe erect, ca. 4.5-6.5 cm long, 2 cm wide at base, evidently coriaceous, slightly embracing the peduncle about 3 mm below the base of the spadix, sagittate-lanceolate, undulate on the margins, somewhat plicate when dry, the apex curled, obtuse, and slightly conduplicate. Spadix rigidly erect, more than 4.5 cm long, 6-9 mm in diameter near base, cylindrical, narrowing slightly toward the tip, reddish-brown when dry, truncate at apex. Flowers quadrate, 1 mm in diameter.

TYPE, A.P.Rodrigo 2690, in the herbarium of the New York Botanical Garden, collected at Enrique Urien, in the Departamento de Tapanaga, of the Argentine Chaco, in November 1940.

MICONIA ESPINOSANA SP. NOV.

H. A. Gleason

Miconia Espinosana Gleason, sp. nov. Sect. Amblyarrhena. Caules juniores glabri, leviter 4-sulcati. Petioli glabri, 1--2 cm. longi. Laminae lanceolatae, acuminatae, integrae, basi obtusae, utrinque glabrae vel juniores leviter furfuraceae, 3-nerviae. Panicula late ramosa pyramidalis; flores 5-meri verisimiliter longe pedicellati, pedicellis propriis 1 mm. longis. Hypanthium carnosum poculiforme, ad torum 4.7 mm. longum, glabrum. Calycis tubus 0.8 mm. productus; lobi late oblongo-ovati, rotundati, a toro 2.8 mm. longi; dentes exteriores adpressi, triangulari-acuminati, lobos fere aequantes. Petala valde inequilatera, obovata, 8.5 mm. longa, alba. Stamina isomorpha; filamenta glabra, 4.3 mm. longa; antherae oblongae, 4.3 mm. longae, 4-loculares, poro ventro-terminali dehiscentes; connectivum simplex. Ovarium semi-inferum; stylus 11 mm. longus, minutissime puberulus; stigma paullo dilatatum, truncatum.

Type, Espinosa 2147, collected between Chilla and Guanaezán, northern Zaruma, Ecuador, at an altitude of 2400 m., and deposited in the herbarium of the New York Botanical Garden. The open panicle, with comparatively few and large flowers on long pedicels jointed near the summit, and the pubescent style at once suggest a kinship with a group of fifteen other species of the northern Andes. Ten of these have been described recently; M. floribunda, grandiflora, majalis, maerantha, and sanguinea appear in Cogniaux's Monograph. Among these fifteen, M. inanis Cogn. & Gl. most nearly approaches M. Espinosana, but differs in considerably smaller flowers, much shorter calyx-lobes, and glandular filaments.

NOTES ON THE MORACEAE - I

Alex D. Hawkes

While checking over the American members of the Moraceae in the herbarium of the New York Botanical Garden, several specimens were found which are apparently not referable to previously published concepts. These new species are described below; they occur in the genera Coussapoa Aublet and Helicostylis Trécul. A discussion of the identity of a confused Ficus from Bolivia is also given.

1. ADDITIONS TO THE GENUS COUSSAPOA

The moraceous genus Coussapoa consists, as now delimited, of some thirty species of generally large trees native in tropical America. It occurs in considerable variety in continental South America, and the Central American region also supports a fair number of species.

Coussapoa is, like most groups of this family, still insufficiently known, and there are evidently many more species still to be described. The trees resemble certain Ficus in that they are often epiphytic stranglers in a juvenile condition, but are seemingly not as aggressive as their congeners in the former group. Further, they are usually not as frequent nor as gregarious in a wild state as are the various Ficus species, the individual specimens being widely scattered and few in numbers over a given area of forest.

The genus was originally established in 1775 by Jean Aublet, in his HISTOIRE DES PLANTES DE LA GUIANE FRANÇOISE, where two species, Coussapoa latifolia and C. angustifolia, were described and figured. Aublet gives the derivation of the generic name from the Galibi Indian vernacular, coussapoui, and the type locality as the Sinemari River region of French Guiana.

In the course of checking over the collections of Coussapoa at the New York Botanical Garden, the writer encountered two specimens which do not appear referable to any known concepts. One of these is from the original country of the genus; it is proposed below as Coussapoa cayennensis. The second novelty is an addition from Panama, where the aggregation is thus far very poorly represented; this is described as Coussapoa chagresiana.

COUSSAPOA CAYENNENSIS Hawkes, sp.nov.

Arbor parva; foliis variabilibus, oblongo-ellipticis usque ad subrotundis, emarginatis, leviter undulatis, puberulis, nerva media prominente; floribus femineis in capitulae reniformae et lobulatae aggregatis.

"Small tree." Bark grey-brown on branches, very roughened and scarred by fallen leaf-bases. Leaves variable in size, from 9-9.5 cm long and 6.5-7 cm wide near apex of stem, to 11.5-13.5 cm long and 10-13 cm wide farther down, oblong-elliptic to almost rotund, more or less deeply emarginate, slightly undulate on margins, minutely and roughly puberulous above, stronger and roughly so below, with a prominent median vein, depressed on front and protruding behind, with two almost equally large veins extending from it at the base, and 5-6 prominent veins toward the apex, the latter often almost opposite; petiole cylindrical or slightly flattened on front surface, with an indented V-shaped area there, which extends almost to base of the organ, 22-30 mm long, 1.5-4 mm broad, often somewhat twisted or attached at a slight angle. Male flowers unknown. Female flowers immature, borne in dense reniform, lobed heads ca 5 mm long and 2 mm thick, several produced on curving branched peduncles up to 1 cm long and 1 mm in basal diameter.

Type: W.E.Broadway 880, collected on July 17, 1921, in the vicinity of Cayenne, French Guiana. The collector's notes state, "Small tree. Leaves rough." The type sheet is deposited in the herbarium of the New York Botanical Garden.

COUSSAPOA CHAGRESIANA Hawkes, sp.nov.

Arbor; foliis magnis, coriaceis, supra subglabris, subtus asperatis, undulatis, oblongo-ovatis, emarginatis, ad basin cordatis; petiolo glabro; inflorescentia terminale; capitulis masculis usque ad 8, aggregatis, bi- usque ad trilobatis, ovoideis vel globosis; capitulis femineis solitariis, leviter lobulatis, segmentis numerosis rotundatis compositis.

Tree, of unknown dimensions. Leaves very large, in maturity up to 33 cm long (including the petiole) and 17 cm wide, somewhat coriaceous, almost completely glabrous on upper surface, minutely asperate below, undulate on the margins, somewhat irregularly scalloped, oblong-ovate, emarginate, rather deeply cordate at base; petiole relatively glabrous, woody, 10.5 cm long and 4 mm wide in our specimen, expanding slightly at base. Inflorescences terminal; male clusters up to eight in number on each spike, mostly somewhat aggregate, up to 7 mm long and 4 mm thick, often deeply bi- or trilobate, ovoid to globose; female clusters apparently solitary, up to 4.5 cm long and 3.5 cm across and 2 cm thick, irregular and obscurely lobed, composed of numerous vaguely rotund segments

about 1.5 mm in diameter, becoming brittle and woody when dried.

Type: Sutton Hayes 354, collected on January 22, 1860, "on the old fort at Chagres" in Panama. The type sheet is in the herbarium of the New York Botanical Garden.

2. A NEW HELICOSTYLIS FROM BRAZIL

The history of the small genus Helicostylis dates back to 1847, when Auguste Trécul established it in ANNALES DES SCIENCES NATURELLES, ser.3, vol. 8, page 134. He based his new group on the old Olmedia tomentosa Poeppig & Endlicher, and named his type species Helicostylis Poeppigiana. This concept is now referred to H. tomentosa (P. & E.) Macbride.

The novelty described below is named in honor of Dr. Adolfo Ducke, ardent student of the Brazilian flora, who collected the type specimen.

HELICOSTYLIS DUCKEI Hawkes, sp.nov.

Arbor mediocris; caudex leviter quadrangularis; folia alterna, supra leviter asperata, subtus nervis pubescentibus, oblonga usque ad oblongo-ovata, acuminata, leviter undulata, petiolo cylindrico; capituli feminei solitarii, depresso-globosi, segmentis numerosis pilosis angulosis compositis; pedunculo asperato; stylus in segmenta 2 filiformia tortilia divisus.

Medium-sized tree growing in dry-land forest. Bark of branches rough and slightly deciduous, greenish-brown. Stem (in our specimen) 2-5 mm thick, vaguely quadrangular when young, becoming rounder with maturity. Leaves alternate, minutely asperate on upper surface; blade oblong to oblong-ovate, short- to long-acuminate, the tip rather blunt, margins slightly undulate, 9-10.5 cm long, 4.5-5.5 cm wide at middle; veins and nerves very prominent below, the median vein and secondaries minutely pubescent; secondaries alternate, 8-10, curved toward margins of leaf and confluent there; petiole rough, cylindrical, 8-12 mm long, ca 2 mm broad, usually somewhat flattened on top surface. Male heads unknown. Female heads solitary, on minutely asperate peduncles 5-10 mm long and 1.5-2 mm thick which are produced from stem at base of petiole, green when fresh (fide Ducke), tawny-brown when dry, depressed-globose in shape, extending at an angle from the stem, divided into numerous velvety angular segments, 12-18 mm in diameter, 7-9 mm thick, with deep indentations between the segments. Style about 3 mm long, divided into two filiform sections which are tightly twisted toward the apex.

Type: Adolfo Ducke 1202, collected on March 12, 1942, at

Estrada do Aleixo, Manáos, in the state of Amazonas, Brazil. The type specimen reposes in the herbarium of the New York Botanical Garden.

3. A CONFUSED CONCEPT IN FICUS

FICUS KATHERINAE Hawkes, nom.nov.

Ficus oblanceolata Rusby in Bull. N.Y. Bot. Gard. 6 (1910) 498, non *F. oblanceolata* Rusby in l.c., 4 (1907) 446.

This nomen novum is necessary because of the duplicate use of the name *Ficus oblanceolata* by Rusby, first in 1907, and again in 1910, both diagnoses appearing in the BULLETIN OF THE NEW YORK BOTANICAL GARDEN.

Both plants are from Bolivia, the typical *Ficus oblanceolata* (1907) having been collected by Rusby (No. 2369) at Coroico, in the Yungas, and the second (1910), for which we here propose the nomen *Ficus Katherinae*, by R.S. Williams (No. 16-60) at New Brazil.

Ficus Katherinae is a striking species, with oblong-elliptic, long-acuminate leaves over 3.5 dm long and 10-11 cm wide. *Ficus oblanceolata* Rusby has small foliage of an obovate shape with a slightly acuminate or obtuse apex, the blades being found up to 11 cm long and 3.5 cm wide above the middle. No fruits are present on the type sheet of *F. Katherinae*, but those of *F. oblanceolata* are about 5 mm in diameter, globose, and yellow-green with darker spots.

THREE NEW SPECIES OF DRYPETES

Joseph V. Monachino

DRYPETES GENTRYII Monachino, sp. nov.

Arbor; ramulis dense puberulis, pilis brevibus patentibus; petiolis 5--12 mm. longis; laminis foliorum 4--7 cm. longis, 2--3 cm. latis; floribus foemineis axillaribus, per fasciculo 1--4; pedicello usque ad 6 mm. longo; sepalibus 5 tomentosis; disco pubescente; ovario 1-loculato tomentoso; stylo breve; stigmatibus 2 capitatis subdilatatis.

Slender tree with dark brown bark; branchlets densely grey puberulent with short spreading hairs; stipules small, deltoid; petioles 5--12 mm. long, puberulent; leaf-blades chartaceous or subcoriaceous, ovate to elliptic, 4--7 cm. long, 2--3 cm. broad, asymmetrical and obtuse at base, mostly short-acuminate

at apex, glabrescent, the reticulation subprominent, open; female flowers axillary, 1--4 in each fascicle; pedicels up to 6 mm. long in young fruit; sepals 5, tomentose; disk pubescent; ovary one-celled, tomentose; style very short; stigmas two, capitate, a little dilated.

Type, Howard Scott Gentry 5597, Mexico, Sinaloa, Capadero, Sierra Tacuichamona, 3500 feet, rocky canyon under basaltic rim, high Short-tree Forest, February 13, 1940, vernacular name: "Cortopico", deposited in the Britton Herbarium at the New York Botanical Garden.

This species has been distributed as D. lateriflora (Sw.) Krug & Urban, which it greatly resembles in habit. It can be easily distinguished, however, by the short spreading pubescence on its branchlets and petioles, and, particularly when comparative material is available, by the more open areolae of the less prominent reticulation in its leaves.

DRYPETES MAGUIREANA Monachino, sp. nov.

Species ad D. Spruceanae valde affinis, sed stipulis conspicuis ovatis usque ad lanceolatis foliaceis 5--10 mm. longis 2--5 mm. latis, pilis remulorum adpressis setaceis, et reticulo nervorum foliorum prominentior differt.

Small tree; branchlets minutely strigose; stipules ovate to lanceolate, foliaceous and nervose, deciduous, 5--10 mm. long, 2--5 mm. broad; petioles short, up to 5 mm. long; leaf-blades ovate, 6--12 cm. long, 3--6 cm. broad, rounded or obtuse at base, somewhat tapering to obtuse at apex, sparsely strigose on the midrib beneath, shining above, the reticulation prominent, rather open; male inflorescence axillary, many-flowered, densely glomerate, strigose; flowers sessile; sepals 5, closely imbricate, obtuse, minutely strigose on the exposed surfaces; stamens 10; anthers in two series, 5 being on a level above the other 5, glabrous; a manifest 8--10-lobed ring surrounding the stamens; rudimentary ovary large, pubescent.

Type, T. Lasser 1413, Venezuela, Bolivar, Alto Caroni, in forests on banks of a brook, April 25, 1946, deposited in the Britton Herbarium at the New York Botanical Garden.

Additional specimens examined: T. Lasser 1758, Venezuela, Bolivar, Kavanayan, in border of forest, 1300 m., May 27, 1946, tree about 7 m. high, flowers white. G. H. H. Tate, British Guiana, Mt. Roraima, Paulo, narrow strip of woods along Kukenam River at Roraima ford, alt. 4000 feet, November 4, 1927, tree with hard shining leaves. G. H. H. Tate 254, British Guiana, Mt. Roraima, Arabupu, slopes of Roraima, alt. 4200 feet, January 1, 1928. These three collections consist of staminate plants and are deposited at the New York Botanical Garden.

This species, as well as the following one, were compared with a fragment of the type of D. Spruceana, borrowed for the purpose from the Geneva Herbarium by Dr. Bassett Maguire. Only

because the Spruce type became available to me, which was made possible through the special efforts of Dr. Maguire, do I propose the present and the following new species.

DRYPETES KRUKOVII Monachino, sp. nov.

Arbor; ramulis puberulis, pilis brevibus patentibus; stipulis parvis caducis; petiolis 3--5 mm. longis; lamina foliorum ovatis usque ad ellipticis 5--9 cm. longis, 2.5--5 cm. latis, reticulo nervorum obscuro; inflorescentiis masculis axillaribus multifloris dense glomeratis; floribus sessilibus; sepalis 5 extus pubescentibus; staminibus 5 annulo breviglanduloso 3-piloso-lepidoso circumdatis, parte centrali floris 3-lepidosa, antheris isometris.

Tree about 18 m. high; branchlets grey puberulent with short spreading hairs (in the type); stipules small, caducous; petioles 3--5 mm. long, puberulent; leaf-blades ovate to elliptic, 5--9 cm. long, 2.5--5 cm. broad, rounded at base, rounded to short-tapering at apex, almost glabrous, somewhat shining above, pale beneath, nervature little raised, reticulation faint; male inflorescences axillary, many-flowered, densely glomerate; flowers closely sessile; sepals 5, closely imbricate, obtuse, pubescent on the exposed surface; stamens 5, anthers reaching the same height, sparsely short-pilose at the apex, a ring of short glands and three small lanceolate hairy scales surrounding the stamens; rudimentary ovary merely of three lanceolate hairy scales.

Type, B. A. Krukoff 6703, Brazil, Amazonas, Rio Madeira, municipality Humayta, near Livramento, on Rio Livramento, immediate shore of river, October 18, 1934, deposited in the Britton Herbarium at the New York Botanical Garden.

Additional specimens examined: The following fruiting specimens, deposited at the New York Botanical Garden, probably belong with this species - A. C. Smith 2692, British Guiana, Essequibo River, near mouth of Onoro Creek, lat. about 1°25' N., dense forest along river, December 15--24, 1937, tree 18 m. high; fruits 3-celled, almost sessile, spheroid, 6 cm. high, 10 cm. broad, faintly 6-lobulate, densely grey-pubescent; styles 3, stigmas broadly flabelliform; branchlets glabrous; leaf-blades 9--14 cm. long, 3.5--7 cm. broad.

With the above-described novelties, the number of species in the genus published for South America is raised from the two known in 1922 when Pax and Hoffmann treated the group in "Das Pflanzenreich" to six. The following is a tentative key to the South American species of *Drypetes*, based on staminate flowers:

1. Leaves clearly serrate; sepals slightly imbricate; filaments and anthers densely pubescent. (Southern Brazil).....
.....D. sessiliflora Fr. Allem.

1. Leaves entire or obscurely undulate-serrate; sepals strongly imbricate; filaments glabrous. (Northern Brazil and northward).....2
2. Ring of glands surrounding stamens; anthers glabrous or slightly pubescent at apex.....3
3. Anthers at two levels, one set of about 5 above the others; rudimentary ovary large.....4
4. Pubescence on branchlets of short spreading grey hairs; stipules small, inconspicuous.....D. Spruceana Muell. Arg. in DC.
4. Pubescence of appressed brownish bristles; stipules foliaceous, conspicuous.....D. Maguireana Monach.
3. Anthers at one level; rudimentary ovary of three small lanceolate scales.....D. Krukoffii Monach.
2. Ring of glands lacking, the central disk marked; anthers at one level; rudimentary ovary small or lacking.....5
5. Flowers 7--many in each fascicle; stamens 8--10; anthers minutely hairy. (Brazil).....D. amazonica Steyererm.
5. Flowers 1--3 in each fascicle; stamens 4--8; anthers glabrous. (Guianas).....D. variabilis Vitt.

It is quite likely that a careful examination of the South American specimens of Drypetes will uncover additional species. Of greater importance is to know the variation-habit in the group. For example, characters for a clear demarcation of D. amazonica and D. variabilis are needed. There is doubt about the proper position of Krukoff 6219 and 6418, from the Rio Madeira, distributed as D. variabilis but seeming closer to D. amazonica. In these specimens the leaves are much smaller and the inflorescences more sparsely flowered than in typical D. amazonica. Krukoff 5624, from Rio Purus, differs from typical D. amazonica in its very long pedicels, in the central disk being glabrous, and in the number of anthers being eleven instead of eight. Klug 3869 and 3880, from San Martín, Peru, named as a new species ined. by Standley, belong with the two above-mentioned species but their precise position is dubious.

NOTES ON NEW AND NOTEWORTHY PLANTS. VI

Harold N. Moldenke

ERIOCAULON REGNELLII Moldenke, sp. nov.

Herba nana; caulis perabbreviatis; foliis rosulatis paucis graminoides pellucidis fenestratis glabris longe attenuatis; vagina satis magna laxa glabra oblique fissa; pedunculis grac-

illimis stramineis 3-costatis glabris tortulosis; capitulis atrogriseis hemisphaericis.

Dwarf herb; stems very much abbreviated; leaves rosulate, few, very thin, grass-like, 10--18 mm. long, usually less than 1 mm. wide, pellucid, fenestrate, glabrous, long-attenuate at the apex; sheath comparatively large, equaling or slightly surpassing the leaves, 10--15 mm. long, loose, several-ribbed, glabrous, obliquely split at the apex, the blade erect, acute, the tip sometimes recurved; peduncles 1--4 or more per plant, very slender, stramineous, 3--5.5 cm. long, glabrous, 3-ribbed, slightly twisted; heads dark-gray, hemispheric, 3--5 mm. in diameter, smooth; involucrel bractlets elliptic or oblanceolate, grayish, about 2.1 mm. long, 1--1.3 mm. wide, obtuse at the apex, glabrous, easily splitting down the middle; staminate florets: sepals 3, separate, blackish, broadly elliptic or obovate, 0.8--1 mm. long, 0.4--0.5 mm. wide, rounded at the apex, glabrous or with a few short hairs at the apex on the back, not barbellate; petals 3, united into a hyaline tube about 1.3 mm. long, free at the apex; stamens 6, about 0.2 mm. long; pistillate florets: sepals 3, separate, elliptic or slightly obovate, navicular, blackish, 1.3--1.4 mm. long, 0.6--0.8 mm. wide, rounded and apiculate at the apex, glabrous except for a very few antrorse hairs near the apex on the back, not barbellate; petals 3, hyaline, erect, spatulate, separate, about 1.7 mm. long and 0.4 mm. wide, short-pilose at the apex, not barbellate, with a small black gland near the apex in the median portion; style about 0.2 mm. long, glabrous; stigmas 3, about 0.4 mm. long; ovary 3-sulcate, 3-celled, 3-ovulate.

The type of this species was collected by Anders Fredrik Regnell (no. III.1740) at Caldas, Minas Geraes, Brazil, on April 20, 1870, and is deposited in the United States National Herbarium at Washington.

JUNELLIA TRIPARTITA Moldenke, sp. nov.

Frutex; ramis ramulisque lignosis rigidis gracilibus, in statu juventute angulosis et laxe albido-pubescentibus, in statu senectute albido-puberulis et teretibus; foliis alternis sessilibus chartaceis profunde 3-partitis viridibus, lobis ellipticis vel anguste oblanceolatis argute acutis, ad basin longe attenuatis, utrinque irregulariter sparseque pilosulis.

Woody shrub; branches and branchlets woody, stiff, slender, rounded when old, angular when young, loosely whitish-pubescent when young, less so or even only whitish-puberulent in age; principal internodes much abbreviated, to 6 mm. long; leaves numerous, alternate, sessile, chartaceous, uniformly bright-green on both surfaces, not blackening in drying, 3-parted practically to the base, the 3 lobes mostly equal, but sometimes the 2 lateral ones reduced, elliptic or narrowly oblanceolate, 5--12 mm. long, 1--1.5 mm. wide, mostly sharply acute

at the apex, long-attenuate at the base, irregularly and rather sparsely pilosulous on both surfaces, often with a few scattered cilia-like hairs on the margins, one-nerved; veinlet reticulation not discernible; inflorescence terminal, spicate; peduncles abbreviated, about 5 mm. long, loosely pubescent like the rachis; spikes 1.5--5 cm. long, densely flowered, the flowers imbricate; bractlets lanceolate, about 4 mm. long and 1 mm. wide, irregularly ciliate-margined, minutely pilosulous on the back, attenuate-acute at the apex; calyx tubular, about 7 mm. long, 5-ribbed, rather unequally 5-toothed, loosely pilose or short-pubescent, the teeth long-apiculate; corolla-tube 9--10 mm. long, glabrous, blackening in drying, the limb to 5 mm. wide, blackening in drying.

The type of this very remarkable species was collected by A. Ruiz Leal (no. 7966) at Las Catitas, dept. Santa Rosa, Mendoza, Argentina, on April 4, 1942, and is deposited in the Britton Herbarium at the New York Botanical Garden. Its alternate leaves and general habit indicate its relationship to J. Eche-garayi (Hieron.) Moldenke, and perhaps both these species are closely related to the genus Dipyrena.

LANTANA ANGOLENSIS Moldenke, sp. nov.

Fruticulus; ramis ramulisque crassiusculis rigidis acute tetragonis vel 5-angulatis asperis, in statu juventute densiuscule albido-substrigosis, pilis bulbosis; foliis oppositis vel ternatis; petiollis densiuscule albido-strigosis; laminis firmis ovatis acutis serratis supra subbullatis, ad basin rotundatis vel subtruncatis, supra dense substrigoso-pubescentibus, subtus densissime albido- vel ochraceo-tomentosis.

Shrubby; branches and branchlets rather stout, stiff, acutely tetragonal or 5-angled, asperous, rather densely substrigose with whitish short hairs on the younger parts, less so in age, the hairs bulbous-based, the bulbous bases persistent on older parts of the stem; nodes not plainly annulate; principal internodes 3--7.5 cm. long; leaves decussate-opposite or ternate; petioles to about 9 mm. long, rather densely whitish-strigose; blades thick and firm, dark-green above, much lighter beneath, ovate, to about 4 cm. long and 2.5 cm. wide, acute at the apex, rounded or subtruncate at the base or varying to subcordate, uniformly serrate with rounded teeth from base to apex, subbullate above, densely substrigose-pubescent with short whitish hairs above, very densely tomentose with white or ochraceous hairs beneath; midrib deeply impressed above, very prominent beneath; secondaries slender, about 5 per side, deeply impressed above, prominent beneath; vein and veinlet reticulation very abundant and conspicuous, deeply impressed above and very prominent beneath; inflorescence axillary; spikes subcapitate in anthesis, elongating to 1 cm. after anthesis; peduncles stout, very short, about 1 cm. long, densely white-strigose; rachis

thick, densely white-strigose; flowers and fruit not seen.

The type of this species was collected by B. Fritzsche (no. 109) at Humpata, Mossamedes, Angola, in May, 1903, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

LANTANA RUGOSA var. *TOMENTOSA* Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum subtus densissime pubescentibus et non rugosis differt.

This variety differs from the typical form of the species in having its leaf-blades very densely pubescent beneath and not conspicuously rugose, the vein and veinlet reticulation plane or only subimpressed above and plane or only very inconspicuously prominulous beneath.

The type was collected by J. A. Wahlberg at Goda Happs-udden, Cape of Good Hope, Union of South Africa, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. Recent investigations have shown that the name *Lantana rugosa* Thunb. is the name which will have to be used for the species hitherto almost uniformly known as *L. salvifolia* Jacq.

LANTANA RUGULOSA f. *ALBIFLORA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by Gunnar Harling (no. 1728) along the side of a river, at an altitude of 20 m., at Esmeraldas, prov. Esmeraldas, Ecuador, on August 28, 1947, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

LANTANA VIBURNOIDES var. *SCHIMPERI* Moldenke, var. nov.

Haec varietas a forma typica speciei foliis inflorescentibusque oppositis vel ternatis, foliis usque ad 13 cm. longis et 4 cm. latis, et pilis crassis patento-hirsutis plerumque pustulatis differt.

This variety differs from the typical form of the species in having its leaves and inflorescences opposite or ternate, the leaves to 13 cm. long and 4 cm. wide, and the pubescence on the branchlets, petioles, leaf-blades, and peduncles coarse and spreading-hirsute, mostly pustulate-based on the branchlets and petioles and midrib beneath.

The type was collected by M. W. Schimper at Dewari, Abyssinia, on October 5, 1863, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

LIFIA AFRICANA var. *SCABERRIMA* Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum usque ad 10 cm. longis et 3.5 cm. latis, supra scaberrimis, pilis bulbosis, ep pilis ramorum ramulorumque pedunculorumque bract-

arumque calycisque bulbosis in inflorescentiae granulis resinosis interspersis differt.

This variety differs from the typical form of the species in its leaf-blades being to 10 cm. long and 3.5 or more cm. wide, very scabrous above with decidedly bulbous-based hairs, and the spreading-hirsute hairs on the branches, branchlets, peduncles, bractlets, and calyx also being bulbous-based and interspersed in the inflorescence with resinous granules.

The type was collected by P. Krook [Fenther 1765] along the Tsitsa River, Griqualand East, Union of South Africa, on January 22, 1895, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

PAEPALANTHUS CARDONAE Moldenke, sp. nov.

Herba nana; caulis erectis conspicuis dense foliosis longe pilosis; foliis graminoides chartaceis acutis vel subacutis utrinque glabris patentibus vel recurvatis; vaginis gracilibus arctusculis adpressis densiuscule pilosis oblique fissis, lamina ad basin ciliata, ad apicem saepe recurvata; pedunculis gracillimis 2-angulatis microscopicè puberulis vel subglabratiss; capitulis hemisphaericis albidis.

Dwarf herb; stems to 4.5 cm. long, erect, densely leafy, long-pilose; leaves closely imbricate at the base, grass-like, 2--3 cm. long, 2--2.5 mm. wide at the mid-point, chartaceous, acute or subacute at apex, glabrous on both surfaces, wide-spreading or the lowest ones slightly recurved; sheaths slender, rather closely appressed, 1--1.5 cm. long, rather densely pilosulous, obliquely split at the apex, the blade ciliate at the base, the apex often recurved; peduncles very slender, 4--6 cm. long, microscopically puberulous or subglabrate, 2-angled; heads hemispheric, about 5 mm. wide, whitish; involucre bractlets ovate to subrotund, about 1.8 mm. long and wide, rounded and apiculate at the apex, dark-brown throughout, glabrate throughout or very obscurely pilosulous at the apex; receptacle long-pilose; receptacular bractlets oblong-obovate or oblong, brownish or buff, 1.3--2 mm. long, 0.8--1 mm. wide, rounded or subtruncate at apex and there densely white-barbellate; staminate florets: sepals 3, separate, dark-brown on the upper half, gray below, oblanceolate, about 1.3 mm. long and 0.4 mm. wide, very densely white-barbellate at the subacute apex; petals 3, hyaline or light-stramineous, united into a slender tube about 1.3 mm. long, the tips free and triangular-acute; pistillate florets: sepals 3, separate, buff, spatulate, about 1 mm. long and 0.4 mm. wide, rounded at the apex, densely long-pilose on the back and very densely white-barbellate at the apex; petals 3, separate, buff, narrow-oblong or linear, about 0.8 mm. long and 0.4 mm. wide, obtuse or subacute at the apex, long-pilose on the back and margins with irregular wide-spreading hairs about as long as the petal; pistil very small; style-appendages

apparently inserted at the same level as the tiny stigmas.

The type of this species was collected by Felix Cardona (no. 2281) in sandy places in Cerro Acopan, altitude 2000 m., Caroní, Bolívar, Venezuela, in October, 1947, and is deposited in the United States National Herbarium at Washington.

PAEPALANTHUS CURURENSIS Moldenke, sp. nov.

Herba parva; caulibus gracilibus elongatis glabris foliosis; foliis membranaceis patentibus non imbricatis anguste lanceolatis vel lingulatis sensim angustatis utrinque glabratibus subtus prominente 4-costatis non fenestratis non vaginatis non scarioso-marginatis; pedunculis rectis gracillimis 3-costatis parce tortulosis glabris stramineis vel fuscis; capitulis hemisphaericis brunnescentibus.

Small herb; stem slender, elongate, to about 14 cm. long, glabrous, uniformly leafy throughout; leaves membranous, spreading at right angles from the stem, not at all imbricate, narrowly lanceolate or lingulate, not at all sheathing or scariously-margined at the base, of uniform texture throughout, gradually narrowed to the acute apex, about 4 mm. long and 0.5 mm. wide, glabrous on both surfaces, not fenestrate, prominently 4-ribbed beneath, the 2 central ribs somewhat larger than the 2 peripheral ones; inflorescence terminal; peduncles about 14 per plant, uniform, erect, very slender, 3.5--4.5 cm. long, 3-costate, slightly twisted, glabrous, stramineous or brownish; heads hemispheric, about 3 mm. broad, brownish; involucre bractlets few, brownish, broadly obovate, about 1.3 mm. long and wide, regularly rounded from the widest part to the apex, subcuneate from the widest part to the base, glabrous; receptacle glabrous; receptacular bractlets stipitate, brownish, the stipe about 0.5 mm. long and 0.2 mm. broad, the terminal blade broadly triangular, 1--1.4 mm. wide and 0.5 mm. high, the projecting sides involute around the flower, glabrous except for the very finely barbellate apex; staminate florets: sepals 3, separate, spatulate, pale-stramineous, about 0.8 mm. long and 0.3 mm. wide, rounded at the apex, very finely and minutely barbellate at the apex on the back, otherwise glabrous; petals 3, united into a pale-stramineous tube about 0.7 mm. long, free and short-lingulate at the apex; stamens 3, slightly surpassing the tube; anthers tiny, yellow; pistillate florets: sepals 3, separate, obovate, brownish, about 1.2 mm. long and 0.4 mm. wide, acute at the apex, very finely and minutely barbellate on the back at the apex, otherwise glabrate; petals 3, separate, scale-like, suborbicular, about 0.4 mm. long and wide, acute at the apex, glabrous, closely appressed to the ovary; ovary 3-celled, 3-sulcate, 3-ovulate, oblong and about 0.8 mm. long and 0.5 mm. wide when mature, glabrous.

The type of this remarkable species was collected in 5--10

cm. of water on the flooded campo adjacent to the banks of Rio Cururú at Porto da Missão Velha, Pará, Brazil, on April 25, 1942, by H. Sioli [Herb. Inst. Agron. do Norte 29159], and is deposited in the Britton Herbarium at the New York Botanical Garden. The insertion of the leaves on the stems and the shape of the receptacular bractlets, along with the scale-like petals in the pistillate florets, are remarkable features of this species.

POLIANTHES TUBEROSA f. *PLENA* Moldenke, f. nov.

Haec forma a forma typica speciei floribus plenis recedit.

This form differs from the typical form of the species in its "doubled" flowers.

The type was collected by H. N. Moldenke (no. 7338) from cultivated material at Watchung, Somerset County, New Jersey, on September 19, 1932, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS ACOPANENSIS Moldenke, sp. nov.

Herba; caulibus abbreviatis dense lanatis; foliis coriaceis circinato-recurvatis rosulatis graminoides obtusis utrinque glabris multicostatis; vaginis laxis glabris tortulosis multicostatis oblique fissis saepe profunde laciniato-lobatis; pedunculis gracillimis solitariis 3-costatis, in statu juventute densiuscule adpresso-pilosis (pilis longis albidis), in statu senectute obscure pilosis vel subglabris.

Herb; stems abbreviated, densely matted-woolly; leaves coriaceous, circinate recurved, uniformly bright-green on both surfaces, rosulate, grass-like, about 8 cm. long, quite uniformly 2 mm. in diameter throughout, blunt at apex, glabrous on both surfaces, many-ribbed; sheath loose, 4--7 cm. long, obliquely split and often deeply lacinate-lobed at apex, glabrous, somewhat twisted, many-ribbed; peduncles very slender, mostly one per plant, to 30 cm. long, 3-angled, rather densely appressed-pilose with long whitish hairs when young, less so or subglabrous in age or obscurely pilose only in the sulcations; heads hemispheric, 1--1.4 cm. wide; involucre bractlets numerous, dark-brown or blackish (the inner ones dark only on their upper exposed half), oblong, about 5 mm. long, 0.8--1 mm. wide, attenuate-acute at the apex, scarious-tipped, apparently ciliate-margined and pilose-barbellate at apex when young, completely glabrous in age; receptacle densely white-pilose or grayish; receptacular bractlets oblong, subhyaline or grayish, about 5 mm. long and 1 mm. wide, attenuate-acute at apex, densely barbellate-pilose at and just below the apex; staminate florets: sepals 3, separate, whitish except for 2 large vertically elongate black spots at the middle, narrow-elliptic, about 3 mm. long and 0.7 mm. wide, attenuate at the apex and densely barbellate there on the back; petals united into a hyaline gla-

brous tube about 3 mm. long, the uppermost 0.5 mm. free and triangular-acute, erect; stamens 3, equaling the corolla-tube; anthers yellow; pistillate florets: sepals 3, separate, hyaline, with 2 small vertically elongate black spots at about $2/3$ the height, oblong, about 4 mm. long and 1 mm. wide, attenuate-acute at the apex, somewhat navicular, with a heavier midrib, appressed-pilose above the middle and slightly barbellate at the apex; petals united into a hyaline tube about 4 mm. long and densely appressed long-pilose on the outside; style very short, glabrous, the appendages about 1.7 mm. long, inserted at about the same level as the 3 short stigmas; ovary large, 3-celled, 3-sulcate, 3-ovulate.

The type of this distinct species was collected by Felix Cardona (no. 2280) in shady places among sandstone rocks, Cerro Acopán, altitude 1900 m., Caroní, Bolívar, Venezuela, in October, 1947, and is deposited in the United States National Herbarium at Washington.

SYNGONANTHUS AKURIMENSIS var. *AMAZONICUS* Moldenke, var. nov.

Haec varietas a forma typica speciei differt foliis 2--2.5 cm. longis, usque ad 1.2 mm. latis, subtus valde prominente multicostratis, pedunculis usque ad 22, 14--20 cm. longis, et vaginis usque ad 2.4 cm. longis et dense patento-pubescentibus.

This variety differs from the typical form of the species in its leaves being 2--2.5 cm. long, to 1.2 mm. wide, and very prominently many-costate beneath; peduncles to 22 per plant, 14--20 cm. long; sheaths to 2.4 cm. long and densely spreading-pubescent like the leaves.

The type was collected by Ricardo de Lemos Fróes (no. 22433) in sandy soil along the bank of the river at Temendauhy on the Rio Negro, Amazonas, Brazil, on June 30, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS AMAZONICUS Moldenke, sp. nov.

Herba nana; caulibus valde abbreviatis; foliis rosulatis linearibus acutis utrinque glabris subtus obscure striatis non conspicue fenestratis; pedunculis solitariis 2-costatis tortuosis glabris; capitulis obconicis vel hemisphaericis albidis vel stramineis.

Dwarf herb; stems greatly abbreviated; leaves rosulate, linear, 1--1.5 cm. long, about 0.5 mm. wide, acute at the apex, glabrous on both surfaces, not plainly fenestrate, obscurely striate beneath; peduncle 1 per plant, 2--2.5 cm. long, 2-costate, slightly twisted, glabrous; heads obconic or hemispheric, whitish or stramineous; involucrel bractlets pale-stramineous, chaffy, lanceolate, 2--2.5 mm. long, 0.5--0.7 mm. wide, acute at the apex, glabrous on both surfaces, shiny; receptacle smooth; receptacular bractlets subhyaline, firm, oblong-oblanccolate, about 2.5 mm. long, slightly navicular, a-

cute at the apex, glabrous; florets apparently all hermaphroditic; sepals 2, separate, hyaline, firm-textured, oblong-lanceolate, slightly navicular, 1.5--2 mm. long, about 0.5 mm. wide, attenuate-acute at the apex, glabrous on both surfaces; petals 2, hyaline, about 1.5 mm. long, connate at the middle, free at apex and base, oblanceolate, glabrous; stamens 2; pistil 1--2 mm. long; ovary 2-celled, 2-sulcate, 2-ovulate, about 0.8 mm. long and brownish when mature.

The type of this curious species was collected by J. Murca Pires (no. 727) in rocky places at the foot of the mountains, Rio Issana, Amazonas, Brazil, on October 24, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS BLACKII Moldenke, sp. nov.

Herba nana; caulibus ut videtur elongatis longe pilosis uniforme foliosis; foliis tenuiter membranaceis graminoides utrinque parce irregulariterque longe pilosis vel in statu senectute glabrescentibus, non fenestratis non prominente costatis; inflorescentiis terminalibus; pedunculis numerosis filiformibus 2-costatis subtortulosis obscure pulverulento-puberulis vel glabrescentibus; vaginis cylindricis acute adpressis irregulariter pilosis oblique fissis; capitulis subglobosis griseis densissime pilosis.

Dwarf herb; stems apparently elongated, long-pilose, uniformly covered with leaves; leaves thin-membranous, grass-like, 1.5--2 cm. long, about 1 mm. wide, sparsely and very irregularly long-pilose on both surfaces or glabrescent in age, not fenestrate nor prominently costate; inflorescence terminal; peduncles 30 or more per plant, filiform, 2-costate, very obscurely pulverulent-puberulent or glabrescent, very slightly twisted, 5--6 cm. long; sheaths cylindrical, about 1 cm. long, closely appressed to the peduncle, irregularly pilose, obliquely split at the apex, the blade erect, attenuate, appressed; heads subglobose, gray, extremely densely pilose, about 4 mm. in diameter; involucreal bractlets rather few, hyaline or subhyaline, lanceolate, about 2 mm. long and 0.5 mm. wide, acute at the apex, glabrous on both surfaces; receptacle very densely long-pilose with white or gray hairs; receptacular bractlets numerous, hyaline, oblanceolate, about 1.6 mm. long and 0.4 mm. wide, acute at the apex, rather densely long-pilose on both surfaces above the middle; pistillate florets: sepals 3, separate, hyaline, oblanceolate, about 1.7 mm. long and 0.4 mm. wide, obtuse or subacute at the apex, glabrous on both surfaces; petals 3, hyaline, connate at the middle, free at base and apex, lanceolate, about 0.8 mm. long and 0.4 mm. wide, densely long-pilose at the apex with white erect hairs; pistil about 1.3 mm. long, glabrous; style-branches 3, about 0.4 mm. long, inserted at the same level as the stigmas which are only

half as long; staminate florets: sepals 3, separate, hyaline, oblong-ob lanceolate, about 2 mm. long and 0.5 mm. wide, densely long-pilose on the back above the middle; petals 3, hyaline, united into a slender tube about 1 mm. long, the free terminal tips also about 1 mm. long, pilose at the apex; stamens 3.

The type of this species was collected by G. A. Black (no. 47-1839) -- in whose honor it is named -- in a savannah at Belterra on the shores of Rio Tapajos, Pará, Brazil, on October 27, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA GLANDULIFERA Moldenke, sp. nov.

Herba procumbens; caulibus ramisque gracilibus obtuse tetragonis patentopubescentibus vel hirtellis, pilis brevioribus glanduliferis; petiolis marginatis; laminis chartaceis ovatis 3-lobatis vel 3-partitis, lobis lobulatis vel obtuse incisus revolutis acuminato-attenuatis supra strigosis subtus irregulariter patentopubescentibus, pilis brevioribus glanduliferis.

Procumbent herb; stems and branches rather slender, obtusely tetragonal, spreading-pubescent or hirtellous with hair of various lengths, the shorter hair glanduliferous; nodes annulate; principal internodes 1--1.5 cm. long or more abbreviated; leaves numerous, decussate-opposite; petioles 3--8 mm. long, margined; blades chartaceous, rather uniformly gray-green on both surfaces, ovate, 1--1.5 cm. long, 7--12 mm. wide, 3-lobed or 3-parted, each lobe again lobed or bluntly incised, revolute-margined, acuminate-attenuate, strigose above, irregularly spreading-pubescent beneath, the shorter hairs glanduliferous, acuminate-attenuate into the petiole at base; midrib very slender, deeply impressed above, very prominent beneath; secondaries and tertiaries very slender, deeply impressed above, very prominent beneath; inflorescence terminal, subcapitate at first, elongating later to about 4 cm.; peduncles 1--2.5 cm. long, spreading-pubescent or hirtellous with hair of various lengths, the shorter hair gland-tipped; bractlets lanceolate, about 5 mm. long, attenuate at apex, puberulent on the back, long-ciliate along the margins; calyx tubular, about 6 mm. long, irregularly pubescent with gland-tipped hairs, 5-costate, the rim 5-apiculate; corolla small, violet, its tube 8--9 mm. long, very minutely puberulous outside or subglabrate, its limb 5 mm. wide.

The type of this species was collected by Nérida S. Troncoso (no. 292) at Ascochinga, altitude 700 m., Córdoba, Argentina, on October 26, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is also known from Catamarca.

VERBENA ORIGENES var. *SEMPERI* Moldenke, var. nov.

Haec varietas a forma typica speciei foliis late ovatis 3-

partitis ca. 3 cm. longis et 2.5 cm. latis, lobis profunde lobulatis utrinque dense patentibus hirsutulis, lobulis rotundato-incisus revoluto-marginatis differt.

This variety differs from the typical form of the species in having broadly ovate 3-parted leaves about 3 cm. long and 2.5 cm. wide, each division deeply lobed with rounded incised lobes, densely spreading-hirsutulous on both surfaces, the margins conspicuously revolute.

The type was collected by J. Semper -- in whose honor it is named -- at Quebrada de las Vacas, altitude 2400 m., dept. Las Heras, Mendoza, Argentina, between March 2 and 20, 1938, and is no. 4937 in the Herbario Ruiz Leal, the type deposited in the Britton Herbarium at the New York Botanical Garden. The leaves are very similar to those of V. crithmifolia Gill. & Hook., but the inflorescence is that of V. origenes R. A. Phil. of Chile.

VERBENA TESSMANNII Moldenke, sp. nov.

Herba; caulibus ramisque argute tetragonis saepe submarginatis densiuscule patento-pubescentibus vel hirtellis; petioliis densiuscule hirtellis; laminis firme chartaceis lanceolatis acutis, ad basin acuminatis, irregulariter crasso-dentatis, supra scaberrimis adpresso-albo-strigosis, subtus irregulariter densiusculeque brevipubescentibus.

Herb; stems and branches elongate, sharply tetragonal, often slightly margined, rather densely spreading-pubescent or hirtellous, the hairs standing at right angles to the surface of the stem or branch; principal internodes 5--8 cm. long; nodes annulate; leaves decussate-opposite; petioles slender, 4--6 mm. long, rather densely hirtellous; blades firmly chartaceous, rather uniformly bright-green on both surfaces or somewhat lighter beneath, lanceolate, 2--4 cm. long, 7--15 mm. wide, acute at apex, acuminate at base, irregularly and coarsely toothed, the lowest teeth often lobe-like, very rough above with long closely appressed white strigose hairs which are bulbous-based, irregularly and rather densely short-pubescent beneath with the pubescence densest and most conspicuous on the larger venation; midrib very slender, impressed above, prominent beneath; secondaries very slender, about 4 per side, impressed above, prominulous beneath; tertiaries rather few and subimpressed above, more numerous and subprominulous beneath; inflorescence terminal, spicate; peduncle slender, scutely tetragonal, spreading-hirtellous like the branches, 1.7--5 cm. long; spikes elongating to 4.5 cm. in fruit, densely many-flowered, the calyxes closely imbricate; bractlets lanceolate, about 6 mm. long, 1 mm. wide, attenuate-subulate at the apex, long-ciliate on the margins (cilia white and antrorse), puberulent on the back; calyx tubular, about 13 mm. long, 5-costate, yellow-green with gray-carmine veins, rather irregularly short-pubescent or puberulent with whitish hairs, marked with scat-

tered black capitate glands, the rim 4-toothed, the teeth about 2 mm. long, narrow-lanceolate, subulate-tipped, widely divergent and often recurved during anthesis and fruiting; corolla lilac, its slender tube to 19 mm. long, irregularly pulverulent outside, the limb about 8 mm. wide.

The type of this species was collected by Günter Tessmann -- in whose honor it is named -- in clear campos at the edge of woods between shrubs and tall herbs at Fazenda Lagoa Dourada, near Vila Velha, altitude 830 m., 21 km. southeast of Ponta Grossa, Paraná, Brazil, on February 17, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ADDITIONAL NOTES ON THE GENUS AEGIPHILA. X

Harold N. Moldenke

AEGIPHILA SELLOWIANA Cham.

The species grows commonly in thickets, at edges of woods, and in river valleys. It has been collected at an altitude of 700 m.

Additional citations: BRAZIL: Goyaz: Fohl & Schott 936/4925 (F--869915). Minas Geraes: P. Clausen s.n. [Herb. Rio de Jan. 32229] (Ja); Heringer s.n. [Herb. Est. Exp. de Café 99; Herb. Dept. Bot. Est. S. Paulo 44981] (N); Mello Barreto 4012 (F--933075), 8723 (F--1009597); Mexia 4203 (F--877945, Gg--286132), 4500 (F--871875, Gg--285614), 5396 (F--877009, Gg--336133). Paraná: Dusén 2532 [Herb. Rio de Jan. 32265] (Ja), 15855 (F--668477), 16162 (Ca--501692), s.n. [Ponta Grossa, 10.12.1903] (Go); G. Jönassen 474a [Herb. Mus. Parana. 633] (Mp). Rio de Janeiro: Sellow s.n. [flowers] (F--976820--cotype), s.n. [fruit] (F--642157--photo of cotype). Rio Grande do Sul: Eugenio Leite 276 (N). Santa Catharina: Rambo 31530 (N). São Paulo: Cirino s.n. [Herb. Inst. Agron. Est. S. Paulo 3152; Herb. Dept. Bot. Est. S. Paulo 41086] (Sp); Heiner 348 (S); Mendes s.n. [Herb. Inst. Agron. Est. S. Paulo 4727; Herb. Dept. Bot. Est. S. Paulo 44310] (Sp); Pickel 4286 [Herb. Dept. Bot. Est. S. Paulo 39166] (Sp), s.n. [Herv. Serv. Florest. Est. S. Paulo 961] (W--1564388); A. P. Viégas s.n. [Herb. Inst. Agron. Est. S. Paulo 3816; Herb. Dept. Bot. Est. S. Paulo 42006] (Sp). State undetermined: Herb. Rio de Jan. 32251 (Ja). CULTIVATED: Brazil: São Paulo: F. C. Hoehne, pl. viv. 192 [Herb. Inst. Biol. 28666] (F--895338, F--895349).

AEGIPHILA SESSILIFLORA Moldenke

The species is described as a large tree, 15 m. tall, with

white flowers, the fruiting inflorescences capitate, fruiting peduncles incrassate, verruculose, to 1 cm. long, glabrate; fruiting-calyxes sessile, incrassate, verruculose, very closely appressed-strigillose with obscure hairs (visible only under a hand-lens), about 5 mm. long and 9 mm. wide, the rim irregularly split. It has been collected in anthesis in August, and in fruit in March and June, growing at altitudes of 1600--1820 m.

Additional citations: COLOMBIA: Cundinamarca: Cuatrecasas 9635 (N, N--photo, W--1795903, Z--photo), 13600 (W--1851414), 13610 (W--1851421); García y Barriga 12494 (N).

AEGIPHILA SKUTCHII Moldenke

The species is described by Skutch as a tree 50 feet tall, 20 inches in diameter at breast height, with white flowers, growing in forests, blooming in October. He says that "all specimen under this number [i.e. 1551] are from same tree, which has 2 forms of flowers". It has been confused with A. elata Sw. Matuda collected it in secondary growth at 1800 m. altitude, blooming in July.

Additional citations: MEXICO: Chiapas: Matuda 1653 (F--1004982, Mh, N), 4190 (Me, Mh, N). GUATEMALA: Suchitepéquez: Skutch 1551 (F--934408--isotype).

AEGIPHILA SMITHII Moldenke

The species has been found in forests, swamp forests, and along trails, blooming in June, July, and October.

Additional citations: PERU: Loreto: Klug 1490 (W--1456409); Mexia 6499 (D--766647, F--718487, Gg--288810); Ll. Williams 680 (F--603891), 1390 (F--613090). San Martín: Klug 3894 (Gg--247823, I).

AEGIPHILA SORDIDA Moldenke

The species is described as a woody vine, with bright-red fruit in July, growing in dense forests at an altitude of 340 m.

Additional citations: PERU: Junín: Killip & Smith 26715 (N, W--1460579).

AEGIPHILA SPICATA (Rusby) Moldenke

Additional citations: BOLIVIA: La Paz: M. Bang 878a, in part (F--633345--photo).

AEGIPHILA SPLENDENS Schau.

An additional synonym is Aegyphylla splendens Schau. ex Moldenke, Suppl. list Invalid Names 1, in syn. 1941. It is so written on the original label of Pohl 1022.

Additional citations: BRAZIL: Minas Geraes: Pohl 1022 [Macbride photos 34308] (F--869261--fragment of isotype, F--976288--photo of type, Kr--photo of type, N--photo of type).

AEGIPHILA SPRUCEANA Moldenke

Additional citations: BRAZIL: Amazonas: Spruce 2296 [Macbride photos 28388] (F--830277--photo of isotype, Kr--photo of isotype, N--photo of isotype).

AEGIPHILA STANDLEYI Moldenke

The species is described as a large shrub, growing in damp forests, at an altitude of 1000--1260 m.

Additional citations: GUATEMALA: Sacatepéquez: P. C. Standley 65004 (F--987432).

AEGIPHILA STEINBACHII Moldenke

The species is described as a small tree, 4--5 m. tall, with yellowish-green flowers, growing in small woods on the "palo-metilla pampa", at an altitude of 400 m., blooming in November.

Additional citations: BOLIVIA: Santa Cruz: Steinbach 3168 (N--type, Z--photo of isotype), 14781 (Go, S).

AEGIPHILA SUFFLAVA Moldenke

The species is described by Klug as a vine with light-yellow flowers, by Williams as a shrub, inhabiting forests, in fruit in August. The fruiting-calyx is heavy, about 7 mm. long, 10--15 mm. wide, very obscurely puberulent, its rim entire and truncate, the fruit globose, 10--13 mm. long and wide.

Additional citations: PERU: Loreto: Klug 2076 (F--642807); Il. Williams 3015 (F--608303).

AEGIPHILA SURFACEANA Moldenke

Ducke in Bol. Tecn. Inst. Agronom. Norte 8: 4 (1946) says that this species is called "anum" (a name also applied to a bird with velvety plumage) and is a scandent shrub of small dimensions, with velutinous leaves, used in popular medicine and witchcraft; cultivated and subsponaneous at Belém and Manaus and probably spontaneous in the surrounding region. He says that it has been cultivated since pre-Columbian times. The flowers are greenish-white, in December.

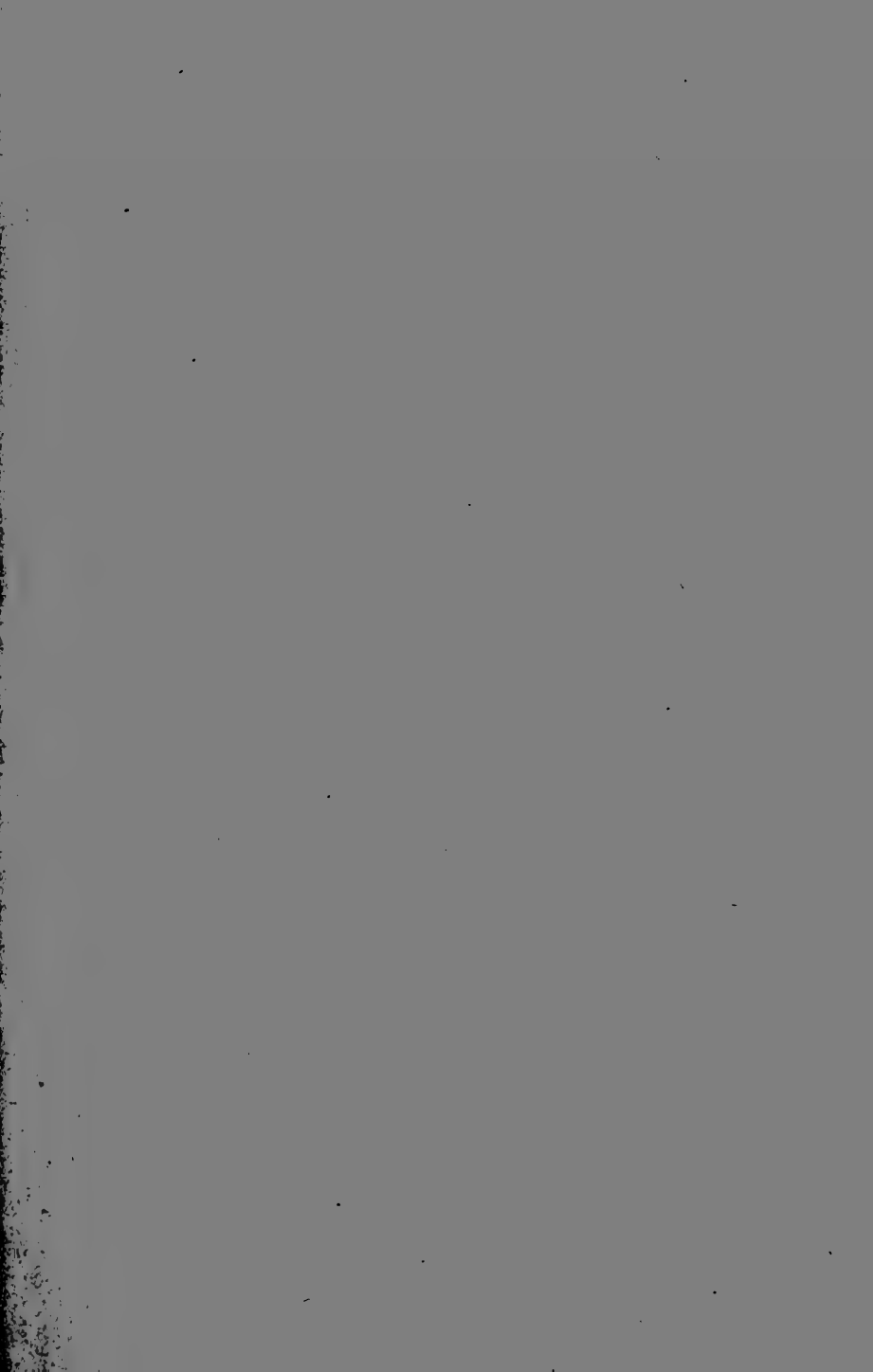
Additional citations: CULTIVATED: Brazil: Amazonas: Ducke 846 (N).

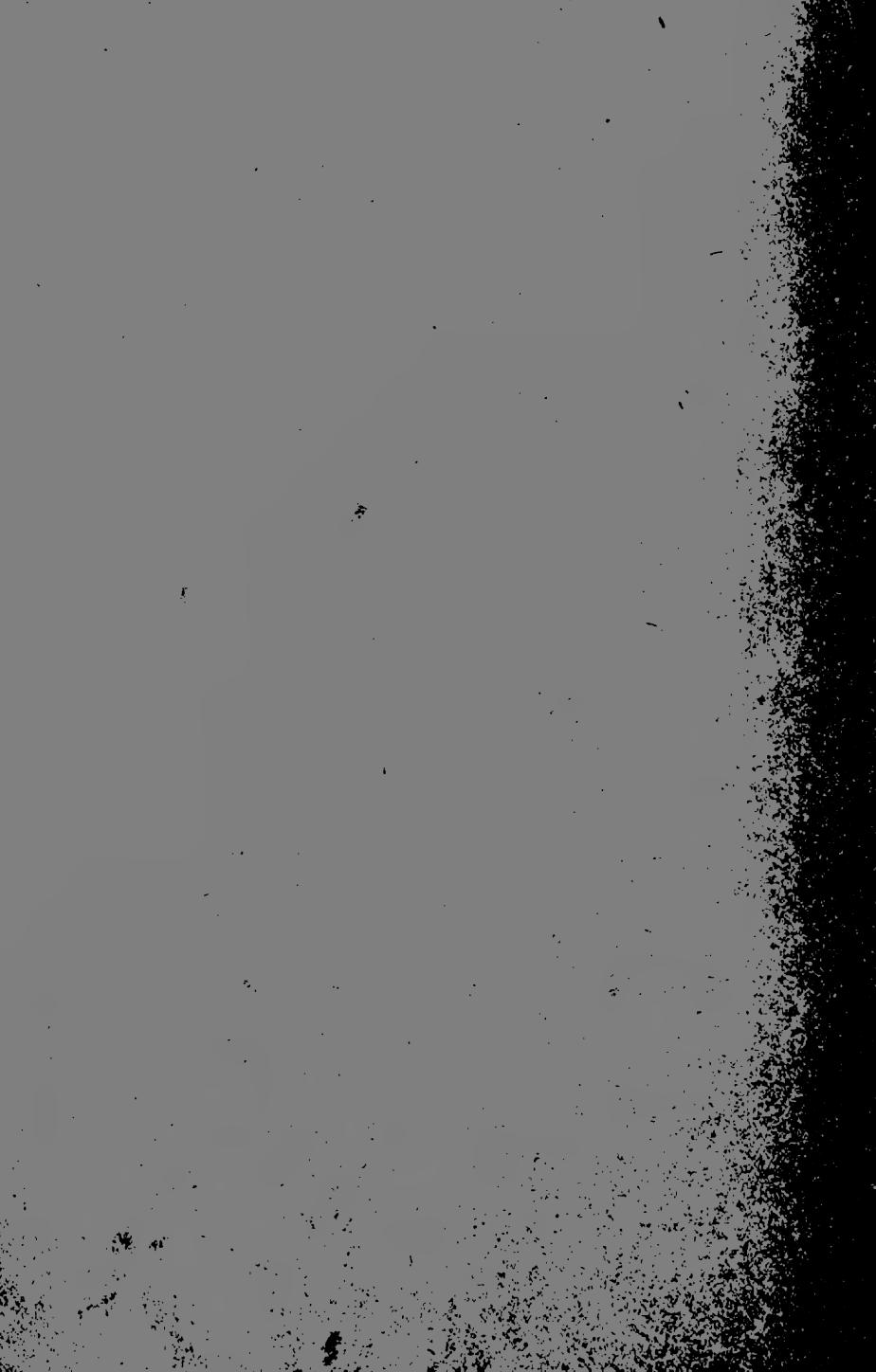
AEGIPHILA SWARTZIANA Urb.

Additional citations: JAMAICA: Swartz s.n. (F--642160, in part--photo of type).

AEGIPHILA TERNIFOLIA (H.B.K.) Moldenke

Additional citations: COLOMBIA: Cundinamarca: Goudot s.n. [near Bogotá] (F--642876--photo). Department undetermined: Lehmann s.n. (F--662548).





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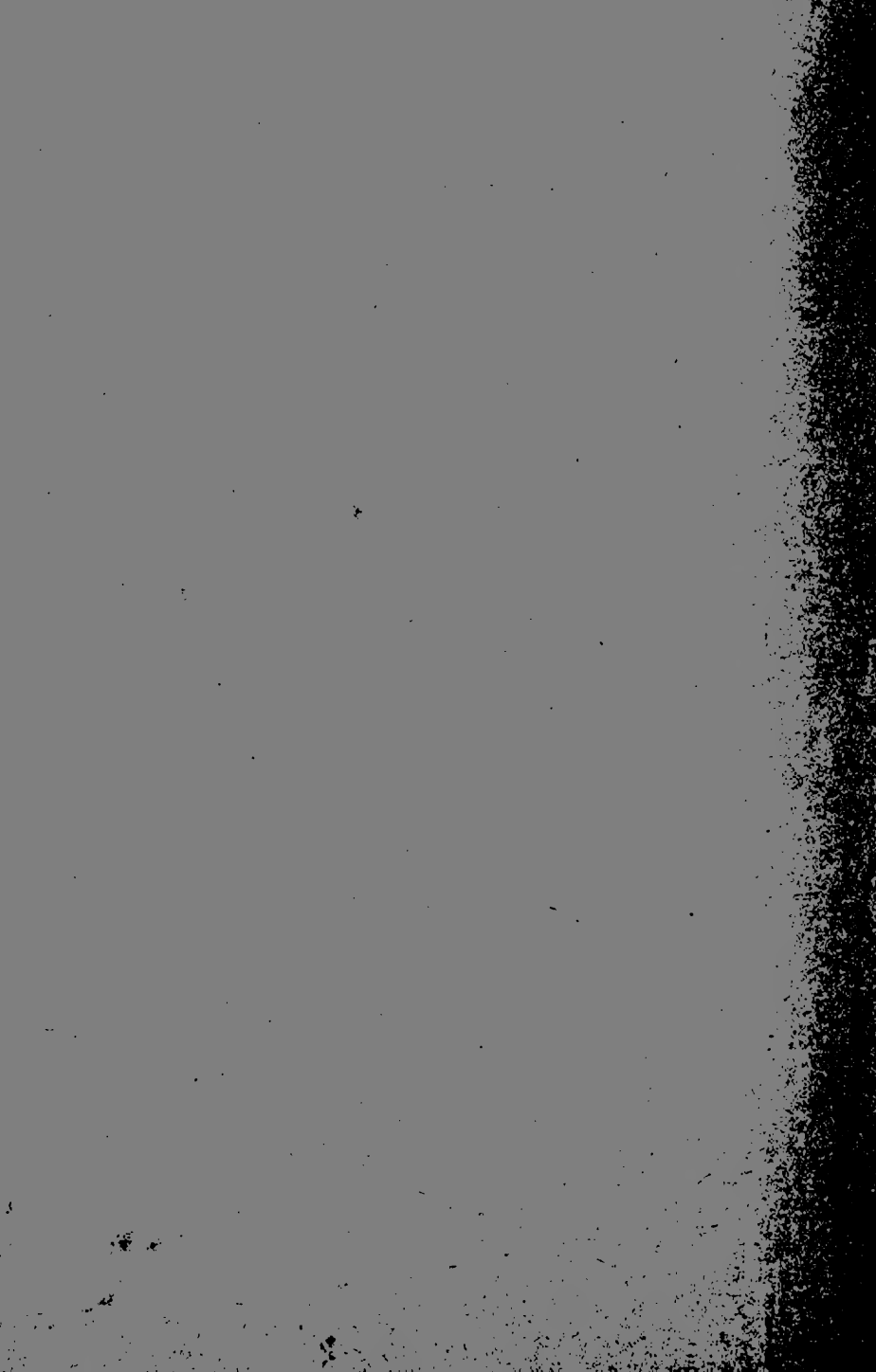
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REGIONAL VEGETATION LITERATURE. II. RHODE ISLAND

Frank E. Egler

This bibliography is the second of a series designed to cover at least the continental United States of America. It follows in form and content that established in 'I. Connecticut' (*Phytologia* 3(1):1-26. 1948), and is restricted to the discipline of regional Vegetation Science as there delimited. References are drawn from such fields as plant ecology, forestry, grazing, wildlife management, soil conservation, and watershed management. The author will be grateful for communications from readers, either in bringing omissions to his attention, or to indicate interest in preparing other units of this bibliography under their own authorships.

Rhode Island is our smallest state, with a land area slightly less than that of Lake Okeechobee in Florida. Its botanical literature is appropriate to its size. Vegetational knowledge is practically non-existent, and is at present to be derived solely from the annotations and comments of workers interested in the flora. Although Rhode Island possesses no great contrasts in landscape, its detailed coast line and its expanses of pitch pine and deciduous forests offer excellent opportunity for pioneering work in the description of plant communities.

The author is indebted to the library staff of the New York Botanical Garden for valuable assistance in the preparation of this number.

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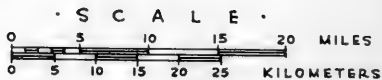
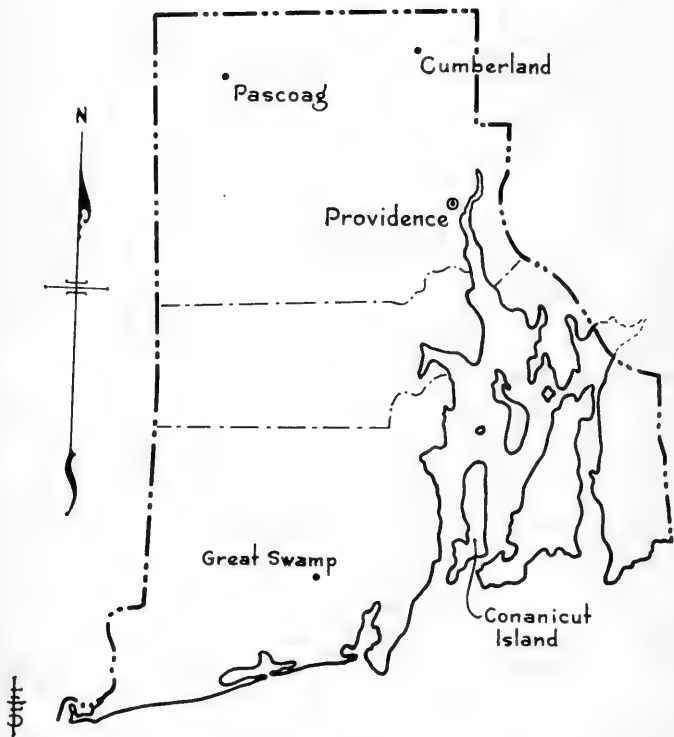
Unannotated list of 737 plants, and corrections; no keys.

1846. *OIney, S. T.* Rhode Island plants, or additions and emendations to the catalogue of plants published by the Providence Franklin Society in March, 1845. *Providence Franklin Soc. Proc.* 1:1-24.

Annotated list of species nos. 738-1009, including cryptogams, raising the total to 942 plants.

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MAP · OF · RHODE · ISLAND



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1920. Collins, J. F. Check list of Rhode Island trees, [8 p.]. *Rhode Island Field Naturalists Club*. Rev. 1924.

Two unannotated lists of over 500 common names, and over 200 scientific names, with cross references. Original 1920 list not seen.

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1941. Wright, K. E., and D. L. Crandall. Rhode Island ferns. *Torrey* 41:73-75.
 Unannotated list of 55 plants; no keys.
1942. Howland, J. Check list of trees and shrubs in Rhode Island. *R. I. St. Coll. [Kingston] Agric. Ext. Mim. Circ.* 21:33 p.
 Unannotated lists of 675 plants, including cultivated species. Bibliography of 22 titles. 'A revision of a List published ... 1940.'

Vegetation Literature Arranged by Localities

GENERAL

1880. Bailey, W. W. Pine barren plants in Rhode Island. *Bull. Torrey Bot. Club* 7:98.
 Notes on New Jersey pine barren species in southern Rhode Island.
1884. B., J. H. Historical trees of Rhode Island. *Random Notes Nat. Hist.* 1:9, 6, 4. Reprinted from *Providence Journal*, April 17, 1884.
 Notes on large and historical individual trees, many of which were part of the original forest.
1886. Bailey, W. W. Some notes on the flora of Rhode Island. *Newport Nat. Hist. Soc. Proc.* 4:3-12.
 A naturalist's account of interesting species in the state as a whole, and on the major kinds of sites.
1889. Northrop, H. H. Forest changes in Rhode Island. *Garden & Forest* 2:105-106.
 Notes on change from pine and cedar forest of Roger William's time, to contemporary oak scrub, presumably north of Providence.
1889. Russell, L. W. Rare trees of Rhode Island. *Garden & Forest* 2:34.
 Notes on local occurrences of six rare species.

1895. *Bailey, W. W.* Among Rhode Island wild flowers, xi, 105 p., 3 pl. Providence: Preston & Rounds. 2nd ed., 4 pl., 1896.
A popular account, including brief summary of the plants of 9 habitats, and the vegetation of 16 localities.
1902. *Card, F. W.* The forests of Rhode Island. *R.I. Agric. Exper. Sta. Bull.* 88: 39 p., 24 f.
With general description and comments of vegetational interest.
1905. *Spring, S. N.* The natural replacement of white pine on old fields in New England. *U.S.D.A. For. Bull.* 63: 32 p., 11 t, 4 pl, folded colored map.
Origin and distribution of old-field white-pine stands.
1926. *Weston, M. D.* Rhode Island [natural areas and regions]. Pp. 330-332 in *Naturalist's Guide to the Americas*, V.E. Shelford, ed., Baltimore, Williams & Wilkins.
Conspectus of 19 areas of notable vegetation, and of state organizations holding areas of natural vegetation.
1927. *Forbush, E. H.* Birds of Massachusetts and other New England states, 3 vols. *Mass. Dept. Agric.*
Containing a section in volume II on 'The faunal areas of New England', pp. xviii-xxiii, with a map of Canadian, Transition, and Carolinian life zones.
1935. *Bromley, S. W.* The original forest types of southern New England. *Ecol. Monogr.* 5:61-89.
Interpretations of pre-colonial forests, emphasizing frequent fires. With maps of principal forest regions and certain forest types.
1937. *Gilbert, B. E.* A study of land utilization in Washington and Kent Counties, Rhode Island. *R.I. St. Coll. Agric. [Kingston] Exper. Sta. Bull.* 261: 32 p., 12 t, 6 f.
With some data on cover types; southern half of state.
1937. *Raup, H. M.* Recent changes of climate and vegetation in southern New England and adjacent New York. *Journ. Arnold Arbor.* 18:79-117.
Interpretations of the pre-colonial oak-chestnut-hickory forests, by earlier warmer and drier climate.
1939. *Palmer, E. J.* Some woody plants of Rhode Island. *Rho* 41: 314-316.
Notes on collections of unusual species.
1944. *Buttrick, P. L.* The forests of Rhode Island. *Amer. forests* 50:440-442, 446, 2 f. Repr. [4 p.].

BLOCK ISLAND (*Block Is. Quadr. 2, 3, 5, 6*)

1893. *Bailey, W. W.* Notes on the flora of Block Island. *Bull. Torrey Bot. Club.* 20:227-231.

Notes on interesting plants.

1893. *Bailey, W. R., and J. F. Collins.* A list of plants found on Block Island, R.I., in July and August. *Bull. Torrey Bot. Club* 20: 231-239.

Unannotated list of 294 vascular plants.

1898. *Hollick, C. A.* Notes on Block Island. *N.Y. Acad. Sci. Annals* 11:55-88, 8 pl.

Primarily geologic, with some botanical notes. 24 plants added to island list. Map of island.

1906. *Hollick, C. A.* An addition to the flora of Block Island. *Torrey* 6:190.

'Numerous specimens of *Botrychium obliquum*.'

CONANICUT ISLAND (*Narragansett Bay 8; Newport 2*)

1892. *Davis, L.D.* The trees and plants of Conanicut Island. *Newport Nat. Hist. Soc. Proc.* 8:32-42.

General features of flora. Unannotated list of angiosperms.

CUMBERLAND (*Franklin 7, 8; Providence 1, 2*)

1947. *Palmer, E. J.* Ferns and fern allies of Cumberland, Rhode Island. *Amer. Fern Journ.* 37:33-38.

Annotated list of 40 plants. Diamond Hill St. For. Pk., town of Cumberland, and 'other parts of ... Cumberland'.

GREAT SWAMP (*Charlestown 2, 3*)

1907. *Reynolds, E. S.* The flora of the Great Swamp of Rhode Island. *tho.* 9: 117-122.

Primarily a list of plants.

1941. *Wright, K. E.* The great swamp. *Torrey* 41:145-150.

Descriptive account of the vegetation.

PASCOAG (Burrillville 1)

1904. *Collins, J. F.* Some interesting Rhode Island bogs.
Rho. 6:149-150.

Notes on unusual plants in a pond near Pascoag.

PROVIDENCE (Providence 4, 5, 7, 8)

1900. *Bailey, W. W.* The old-time flora of Providence. *Rho* 2:213-220.

Notes on the occurrences of interesting species and localities in the period 1828-1837.

1928. *Cormack, M.* Trees and shrubs of Roger Williams Park, 49 p., 38 f.,
illustr., folded map. *Providence: Roger Williams Park Museum.*

Dendrologic notes, general information, lists, and descriptions of areas in the 431-acre Park. See also Park Museum Bulletins of the Roger Williams Park for popular botanical information.

Vegetation Literature Arranged by Authors

- B., J.H.* 1884. See GENERAL.
- Bailey, W.W.* 1880. See GENERAL.
1886. See GENERAL.
1893. See BLOCK ISLAND.
and *J.F. Collins.* 1893. See BLOCK ISLAND.
1895, 1896. See GENERAL.
1900. See PROVIDENCE.
- Bennett, J.L.* 1888. See STATE FLORAS.
- Bromley, S.W.* 1935. See GENERAL.
- Buttrick, P.L.* 1944. See GENERAL.
- Card, F.W.* 1902. See GENERAL.
- Collins, J.F.* 1893. See Bailey, W.W. ..., BLOCK ISLAND.
1904. See PASCOAG.
1915. See STATE FLORAS.
1920, 1924. See STATE FLORAS.
1921. See STATE FLORAS.
- Cormack, M.* 1928. See PROVIDENCE.
- Crandall, D.L.* 1941. See Wright, K.E. ..., STATE FLORAS
- Davis, L.D.* 1892. See CONANICUT ISLAND.
- Fernald, M.L.* 1906. See STATE FLORAS.
1910. See STATE FLORAS.
1922. See STATE FLORAS, 1920, Prov. Franklin Soc.

- Forbush, E.H.* 1927. See GENERAL.
- Gilbert, B.E.* 1937. See GENERAL.
- Hollick, C.A.* 1898. See BLOCK ISLAND.
1906. See BLOCK ISLAND.
- Howland, J.E.* 1942. See STATE FLORAS.
- Madison H.L., and E.W. Magoon.* 1915. See STATE FLORAS.
- Magoon, E.W.* 1915. See Madison, H.L. ..., STATE FLORAS.
- [*Noble, G.H.*] 1920. See STATE FLORAS.
- Northrop, H.H.* 1889. See GENERAL.
- Olney, S.T.* 1845. See STATE FLORAS.
1846. See STATE FLORAS, 1845. Olney, S.T.
1847. See STATE FLORAS, 1845. Olney, S.T.
- Palmer, E.J.* 1939. See GENERAL.
1947. See CUMBERLAND.
- Raup, H.M.* 1937. See GENERAL.
- Reynolds, E.S.* 1907. See GREAT SWAMP.
- [*Rives, W.C., Jr., W.W. Bailey, et al.*] 1885-1888. See STATE FLORAS.
- Russell, L.W.* 1885-1886. See STATE FLORAS.
1889. See GENERAL.
1900. See STATE FLORAS.
- Spring, S.N.* 1905. See GENERAL.
- Weston, M.D.* 1926. See GENERAL.
- Wright, K.E. and Crandall, D.L.* 1941. See STATE FLORAS.
1941. See GREAT SWAMP.

A NEW SPECIES OF CHROMOLUCUMA FROM BRITISH GUIANA

Joseph V. Monachino

Chromolucuma Baehiana Monachino, sp. nov. Arbor ca. 30 m.; stipulae foliaceae; petioli ca. 3--4 cm. longi; folia apice ramulorum congesta, 25--30 cm. longa et 9--13 cm. lata, obovato-elliptica, supra glabra, infra adpressae ferrugineo-sericeae, costa nervis venulisque prominulis, costulis secundariis utrinque ca. 21; flores ad axillam foliorum numerosis fasciculati, pedicelli ferrugineo-tomentosi filiformes 7--9 mm. longi; sepalala 5 extus ferrugineo-tomentosa 7--9 mm. longa; corolla cylindrica, lobi 5 extus puberulati; filamenta brevissima ca. medio tubi affixa, antherae ovatae, 1 mm. longae; staminodia parva, ovato-lineariformia; ovarium hirsutum, 5-loculare, stigmate vix distincte 5-tuberculato.

Tree with scanty latex, about 30 m. tall and 6 dm. in diameter, buttressed to 2.5 dm. from the base; branches robust; leaves tufted, terminal; stipules foliaceous, lanceolate, conduplicate, about 2--3 cm. long, 10--17 mm. broad (expanded), acute at apex, narrowed into a petiole at base, nervous, pubescent, deciduous, leaving a circular stipule-scar; leaf-petiole about 3--4 cm. long, pubescent; leaf-blade obovate-elliptic, about 25--30 cm. long, 9--13 cm. broad, rounded or obtuse at apex and base, glabrous above, rusty-sericeous beneath, the hairs medifixed, the lateral nerves about 21 pairs, arcuate near the margins and connected by a marginal nerve, the reticulation fine, raised, more prominent on the under side; inflorescences in dense axillary fascicles; pedicels (in Jenman 5027) 7--9 mm. long, pubescent; sepals quincuncial, ovate to ovate-oblong, about 3--4 mm. long and 2.5 mm. broad, subacute at the apex, rusty-sericeous with medifixed hairs outside, glabrous or nearly so inside; only immature corolla seen (type), creamy-white, obscurely pubescent on the lobes outside, the lobes 5, imbricate, ovate; stamens attached at about the middle of the corolla-tube, the filaments short, the anthers ovate, 1 mm. long, the staminodes minute, linear-ovate, about 0.5 mm. long, microscopically papillose near the apex; ovary densely hirsute, 5-locular, the style about 1.5 mm. long, the stigma faintly 5-tuberculate.

Type: For. Dept. Brit. Guiana 4249 (Field No. F.1513), British Guiana, 107 m. Bartica-Potaro Road, Kakaralli Clump Wallaba forest, Nov. 17, 1943; vernacular name "Bakupar;" deposited in the Britton Herbarium at the New York Botanical Garden.

Additional specimens examined: Jenman 5027, British Guiana, near Bartica, Nov. 1888; two sheets deposited in the Brit-

ton Herbarium at the New York Botanical Garden.

This species is named in honor of Dr. Charles Baehni whose work on the Sapotaceae has greatly facilitated the present study.

Dr. Baehni (Candollea 9: 291. 1942) reduces Chromolucuma Ducke to sectional rank under Pouteria. There is much to recommend this disposition, and C. Baehniana, with its 5-celled instead of 3-celled ovary, further nullifies the characters which have been advanced to delimit the two genera. Essentially the only feature which separates Chromolucuma from all American species of Pouteria (of which about 190 have been recognized) is the presence of stipules. These are foliaceous and conspicuous, and are here judged sufficiently characteristic to maintain the genus. Many generic differences in the Sapotaceae are tenuous, and those of Chromolucuma fall into this class.

Chromolucuma, both as a genus and as a section, has hitherto been represented by a single species, C. rubriflora Ducke, published in 1925. The present novelty is easily distinguished by several characters -- vegetatively, by the leaves which are sericeous beneath and have a less prominent reticulation particularly on their upper surface.

The vernacular name given for C. Baehniana is also reported for Pouteria grandis Eyma.

NOTES ON NEW AND NOTEWORTHY PLANTS. VII

Harold N. Moldenke

BOUCHEA CHASCANOIDES Moldenke, sp. nov.

Frutex; ramis brevibus irregularibus valde sarmentosis obscure breviterque pubescentibus glabrescentibus; sarmentis erectis densissime breviterque pubescentibus paullo glandulosis; internodiis valde abbreviatis; foliis oppositis confertis carniusculis dense breviterque pubescentibus; laminis flabelliformibus regulariter crenato-serratis ad basin longe acuminatis; inflorescentiis terminalibus axillaribusque paucifloris.

Shrub; branches short, irregular, very twiggy, obscurely short-pubescent, becoming glabrescent; twigs erect, very densely short-pubescent, slightly glandular; nodes obscurely annulate; principal internodes much abbreviated, mostly 2--5 mm. long (rarely to 2 cm. long); leaves decussate-opposite, crowded on the twigs only, rather fleshy, brunnescent or nigrescent in drying; petioles slender, 2--5 mm. long, densely short-pubescent with antrorse slightly glandular hairs; blades flabelliform, 4--7 mm. long and wide, regularly crenate-serrate

with rounded teeth, long-acuminate into the petiole at base, densely short-pubescent on both surfaces; midrib and secondaries slender, rather indistinct, slightly prominulous but mostly hidden by the pubescence beneath; inflorescence terminal and axillary, the terminal spike few-flowered, about 1.5 cm. long in fruit, the laterals solitary in the upper leaf-axils; peduncles and pedicels obsolete; corolla pink; fruiting-calyx tubular, about 9 mm. long, densely short-pubescent, 5-costate and -plicatulate, 5-lobed at the apex (the lobes about 2 mm. long), splitting at maturity; cocci about 4 mm. long, dark-brown.

The type of this very distinct species was collected by F. Markgraf, Mello Barreto, and A. C. Brade (no. 3399) at Corregos dos Mortos, Grão Mogol, Minas Geraes, Brazil, on November 11, 1958, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species bears striking similarity to the Old World genus Chascanum.

CITHAREXYLUM REITZII Moldenke, sp. nov.

Arbor; ramulis sarmentisque graciusculis griseis vel brunneis obtuse tetragonis obscure pilosulis vel strigillosis glabrescentibus lenticellatis; foliis oppositis brunnescentibus vel nigrescentibus; petiolis anguste alatis; laminis elliptico-obovatis chartaceis rotundatis vel acutis vel breviter subacuminatis, ad basin longe acuminatis, margine subadpresso-serrato, utrinque glabris vel subglabris; inflorescentiis axillaribus racemiformibus multifloris.

Tree, 5 m. tall; branchlets and twigs rather slender, grayish or brownish, obtusely tetragonal, very obscurely and irregularly pilosulous or strigillose, glabrescent in age, rather abundantly lenticellate with more or less longitudinally elongate lenticels; nodes not annulate; principal internodes 3-6 mm. long, or much more abbreviated on lateral twigs; leaves decussate-opposite, brunnescent or nigrescent in drying; petioles about 1 cm. long, very minutely and obscurely strigillose, narrowly winged and merging into the blade; blades elliptic-obovate, chartaceous, 3-9 cm. long, 1.2-3 cm. wide, varying from rounded (on small leaves) to acute or shortly subacuminate at apex, long-acuminate into the petiole at base, rather regularly subappressed-serrate on the margins from the widest point to the apex, glabrous on both surfaces or very obscurely strigillose on the lower midrib and minutely barbellate in the axils beneath; midrib flat above, prominulous beneath; secondaries slender, 2-4 per side, arcuate-ascending, flat above, subprominulous beneath; vein and veinlet reticulation obscure; inflorescence axillary, racemiform, about 8 cm. long, many-flowered; peduncle and rachis angular, nigrescent in drying, minutely and obscurely strigillose; pedicels very slender, about 1 mm. long, minutely puberulent; calyx about 2.5 mm. long, glabrous except for the ciliolate subtruncate rim; corolla white,

apparently about 5 mm. long, the lobes white-woolly.

The type of this species was collected by R. Reitz (no. c. 175) "na capoeira da vargem", Rodeio da Areia, Arar, Santa Catharina, Brazil, on November 12, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector describes the fruit as "baga de 1-1,50 cm."

DURANTA WRIGHTII Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus griseis armatis; sarmen-tis gracillimis obscure puberulis; foliis oppositis; laminis firmis subcoriaceis supra atroviridibus nitidissimisque, subtus pallide viridibus nitidisque, ellipticis vel subobovatis, ad apicem rotundatis vel emarginatis, ad basin acutis vel acuminatis, integris subrevolutis utrinque glabris.

Shrub; branches and branchlets slender, light-gray, armed with numerous, opposite, straight, stiff, sharp-pointed spines which are 6--10 mm. long and issue at right angles to the branch; twigs very slender, rather obscurely puberulent when young; principal internodes 1.5--3 cm. long; nodes not annulate; leaves opposite, decussate; petioles slender, 2--4 mm. long, minutely strigillose; blades firm-textured or subcoriaceous, dark-green and very shiny above, light-green and shiny beneath, elliptic or slightly obovate, 1.2--3.2 cm. long, 7--18 mm. wide, rounded or emarginate at the apex, acute or acuminate at base, entire, slightly revolute-margined, glabrous on both surfaces; midrib slender, impressed above, sharply prominent beneath; secondaries very slender, 4 or 5 per side, ascending, impressed above, inconspicuously subprominulous beneath; veinlet reticulation obscure or indiscernible on both surfaces; inflorescence axillary and terminal, racemiform, 1.5--6 cm. long, many-flowered; rachis very slender, straight or slightly curvate, very minutely strigillose; pedicels about 1 mm. long, strigillose; calyx tubular, about 4 mm. long and 2 mm. wide, 5-costate, 5-apiculate, strigillose; corolla-tube about 7 mm. long, pulverulent-puberulent above; corolla-limb about 6 mm. wide, more or less pulverulent-puberulent.

The type of this species was collected by Charles Wright (no. 1358) -- in whose honor it is named -- somewhere in Cuba between 1860 and 1864, and is deposited in the Torrey Herbarium at the New York Botanical Garden.

FARADAYA VITIENSIS var. *PUBERULENTA* Moldenke, var. nov.

Haec varietas a forma typica speciei ramulis pedunculisque pedicellisque foliis immaturisque dense flavido-puberulis recedit.

This variety differs from the typical form of the species in having the youngest parts of its branches, the immature leaves, the peduncles, and the pedicels densely flavescent-puberulent.

The type of this variety was collected by Albert Charles Smith (no. 5799) at the edge of the forest, at an altitude of 870-970 m., between Mt. Tomanivi and Nasonggo, on the northern portion of the Rairaimatuku Plateau, Naitasiri, Viti Levu, Fiji Islands, between August 21 and September 18, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LANTANA CAMARA var. *RUBELLA* Moldenke, var. nov.

Haec varietas a forma typica speciei caulis aculeatis et corollis semper rubellis recedit.

This variety differs from the typical form of the species in having prickly stems and all its corollas always pink in color.

The type was collected by Alma L. and Harold N. Moldenke (no. 19861) in a sandy scrubland at Guanabacoa, Havana, Cuba, on November 27, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. The variety was growing in great profusion at the type locality. Hundreds of plants were seen, all in full bloom, and without a single variation in the color of the corolla.

LIPPIA BRADEI Moldenke, sp. nov.

Frutex; ramulis gracilibus obtuse tetragonis dense breviterque pubescentibus, pilis glanduloso-capitatis; foliis oppositis; petiolis dense glanduloso-pubescentibus; laminis coriaceis suborbicularibus, ad marginem regulariter undulato-repandis subrevolutisque, utrinque densiuscule breviterque pubescentibus; inflorescentiis axillaribus capitatis.

Shrub; branchlets slender, obtusely tetragonal, densely short-pubescent with erect glandular-capitate hairs, the brownish bark splitting irregularly into longitudinal fissures; nodes rather obscurely annulate; principal internodes 1--2.5 cm. long; leaves decussate-opposite; petioles very slender, about 3 mm. long, densely short-pubescent with erect glandular-capitate hairs; blades coriaceous, suborbicular, 7--11 mm. long, 6--12 mm. wide, regularly undulate-repand and slightly subrevolute along the margins, rather densely short-pubescent on both surfaces with capitate hairs but the glandular tips soon wearing off; midrib very slender, impressed above, prominent beneath; secondaries very slender, 3 or 4 per side, ascending, impressed above, prominent beneath, terminating in the sinuses of the marginal undulations; veinlet reticulation limited to a few more or less parallel tertiaries which connect the secondaries at right angles, subimpressed above, prominent beneath; inflorescence axillary, capitate, 2 per node, surpassing the subtending leaves, widely divergent in fruit; peduncles slender, 1--1.5 cm. long in anthesis, elongate to 4 cm. in fruit, densely glandular-pubescent like the branchlets; heads hemispheric, 1--1.5 cm. wide, densely many-flowered;

bractlets large, elliptic, about 5 mm. long and 1.5 mm. wide, densely glandular-pubescent, subacute at apex; corolla lilac, its tube about 4 mm. long, densely glandular-puberulent outside, its limb about 3 mm. wide.

The type of this distinct species was collected by F. Markgraf, Mello Barreto, and A. C. Brade (no. 3369) on "rochedos Algonquianos", Montes Claros, Serra do Calixto, Minas Gerais, Brazil, on November 11, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is named in honor of Dr. Alexander Curt Brade, distinguished botanist, respected colleague and friend of the Jardim Botânico at Rio de Janeiro.

PAEPALANTHUS POLYTRICHOIDES f. *VILLOSUS* Moldenke, f. nov.

Haec forma a forma typica speciei caulibus folisque vaginisque pedunculisque dense albo-villosis recedit.

This form differs from the typical form of the species in having its stems, leaves, sheaths, and peduncles very densely villous with long, white, spreading hairs, which, however, wear off in age.

The type of this form was collected by Alma L. and Harold N. Moldenke (no. 19582) in dry sandy soil on the Zanderry Savanna, Surinam, on September 9, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. While the typical form also is more or less villose when immature, with the hairs later "burning" off in the scorching heat of the open savannas, the present form is many more times as abundantly hairy as the typical form. Many thousands of individual plants of the typical form were observed while traversing the Zanderry Savanna. The present form was growing among the typical plants, in precisely the same soil and exposure to the sun, and the plants seemed to be of identical age, yet they could be differentiated even at a distance by their white-woolly appearance.

SOMPHOXYLON CAPREOLATA Moldenke, sp. nov.

Planta scandens; ramulis gracillimis pallide griseis capreolatis dense breviterque pubescentibus; laminis membranaceis late ellipticis vel subovalibus ad apicem rotundatis et breviter mucronato-acuminatis, ad basin rotundatis, integris in costa et venis secundariis subtus breviter pubescentibus; inflorescentiis compositis utroque breviter denseque pubescentibus; sepalibus 6 isometris.

Vine; branchlets very slender, very light-gray, densely short-pubescent with whitish antrorsely curved or twisted hairs, bearing tendrils; tendrils much twisted, 8--10 cm. long, slightly short-pubescent at the base, soon glabrescent, very light-gray; petioles flattened, 1--2.5 cm. long, densely short-pubescent with very light antrorsely curved or twisted hairs; blades membranous, broadly elliptic or almost oval, 6.5--10 cm.

long, 3.5--7.5 cm. wide, rounded to a short mucronate-acuminate apex, rounded at base (or acute when immature), entire, short-pubescent with very light appressed hairs on the midrib and larger veins beneath and on them also at the base of the leaf only above; midrib, secondaries, and veinlet reticulation plane on both surfaces, decidedly flattened beneath, the 5 main secondaries issuing in palmate fashion from the apex of the petiole; inflorescence compound, to about 25 cm. long, the branches 3--7.5 cm. long, densely short-pubescent throughout with very light curved or twisted hairs as on the branchlets; only staminate flowers seen; pedicels very slender, about 0.6 mm. long, minutely puberulent; sepals 6, all equal in size, connate at the base, lanceolate, about 0.8 mm. long, concave, about 0.2 mm. wide, attenuate-acute at the apex, pilosulous, very thin-textured; petals 6, lanceolate, about 0.4 mm. long and 0.2 mm. wide, concave, acute at the apex, pilosulous; stamens 3, connate to near the apex of the filaments.

The type of this species was collected by Teodoro Rojas (no. 1844) at Tagatiyá, Paraguay, on December 12, 1916, and is deposited in the herbarium of the Instituto de Botânica at São Paulo (no. 46343).

STACHYTARPHETA AUSTRALIS f. *ALBIFLORA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having pure-white corollas.

The type was collected by Alma L. and Harold N. Moldenke (no. 19654) in low wet soil at edge of lake at Interlagos, São Paulo, Brazil, on September 25, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA BANGIANA Moldenke, sp. nov.

Herba; caulibus ramisque acutiuscule tetragonis plus minusve pilosis, saepe fistulosis et profunde sulcatis; foliis oppositis; petiolis late alatis; laminis chartaceis ellipticis vel subobovatis acutis, ad basin longe attenuatis, apicem versus irregulariter dentatis vel supremis integris oblongisque, utrinque parciuscule adpresso-pubescentibus vel strigosis; inflorescentiis terminalibus axillaribusque spicatis densis longe-bracteolitis.

Herb; stems and branches rather acutely tetragonal, scattered-pilose, more densely so on the youngest parts, often more or less hollow and then deeply sulcate in drying; nodes annulate; principal internodes 3--10 cm. long; leaves decussate-opposite; petioles 5--10 mm. long, broadly winged and merging into the blade; blades chartaceous, rather uniformly bright-green on both surfaces, elliptic or slightly obovate, acute at apex, long-attenuate into the petiole at base, rather irregularly dentate from the widest part to the apex or occasionally from

below the widest point with sharply acute antrorse and slightly divergent teeth, or the uppermost ones oblong and entire, rather sparsely appressed-pubescent or strigose on both surfaces; the slender midrib and 6--8 secondaries subimpressed above and prominent beneath; larger parts of the veinlet reticulation often also subimpressed above and prominulous beneath; inflorescence terminal and in the uppermost axils, spicate; peduncles resembling the uppermost parts of the stem and branches in all respects, 1--7 cm. long, pilose; floriferous portion of the spikes short and very dense-flowered, 2--6 cm. long, conspicuously bracteate; bracts oblong-lanceolate, about 5 mm. long, acuminate, ciliolate-pilosulous, or the lowest pair to 2 cm. long and 3 mm. wide; calyx about 4 mm. long, strigose-pilosulous, 5-costate, 5-apiculate; corolla-tube barely surpassing the calyx, its limb about 1.5 mm. wide.

The type of this species was collected by Henry Hurd Rusby (no. 911) at Sorata, at an altitude of 8000 feet, La Paz, Bolivia, in February, 1886, and is deposited in the Columbia University Herbarium at the New York Botanical Garden. The species is named in honor of Miguel Bang, who collected so extensively in Bolivia for Dr. Rusby. The species resembles *V. litoralis* H.B.K. in general habit, while its inflorescences resemble those of *V. hispida* Ruiz & Pav.

A NEW SPECIES OF *COSMIBUENA* FROM GUATEMALA

Joseph V. Monachino

COSMIBUENA HOLDRIDGEI Monachino, sp. nov.

Arbor, foliis glabris; petiolis 2--3.5 cm. longis; laminis foliorum ovalibus 8--12 cm. longis, 3.5--6.5 cm. latis, ad basin acutis, ad apicem obtusis et abrupte breviterque acuminatis; nervis lateralibus prominulis 8--12-jugis; inflorescentiis cymosis trifloris; parte libera tubi calycis ca. 2 mm. longa, lobis calycis lineari-lanceolatis rigidis 3--6 mm. longis; lobis corollae glabris epapillosis; stylo glabro.

Small glabrous tree; stipules oval, rounded at apex; petioles 2--3.5 cm. long; blades oval, 8--12 cm. long, 3.5--6.5 cm. broad, narrowed into the petiole at base, obtuse at apex and somewhat abruptly short-acuminate with a broad acumen about 5 mm. long, subcoriaceous, lustrous above, paler beneath, the lateral nerves prominulous, close, 8--12 pairs, ascending; inflorescences cymose, 3-flowered (in type); peduncles short, up to 1 cm. long; pedicels about 1.5 cm. long; calyx tapering into the pedicel, the adherent portion about 1 cm. long, the free

calyx-tube short, about 2 mm. long, the calyx-lobes linear-lanceolate, 3-6 mm. long, rigid, somewhat spreading; corolla-tube 7.5 cm. long; corolla-lobes oval, 3-3.5 cm. long, about 1.8 cm. broad, obtuse to subacute at apex, glabrous, not papillose (very faintly papillose on margins at base); anthers about 2 cm. long; style glabrous.

Type: L. R. Holdridge s.n. (Monachino 519), Guatemala, Barillas to Tokija, July 1948, deposited in the Britton Herbarium at the New York Botanical Garden. The specimen was collected by Dr. Holdridge and submitted for my examination by Mr. B. A. Krukoff who furnished the data.

The only other species of Cosmibuena known from Central America are C. Skinneri (Oerst.) Hemsl. and C. paludicola Standley. C. ovalis Standley is a synonym of C. Skinneri, as I have ascertained from examination of the type collections.

C. Holdridgei is easily distinguished from C. Skinneri and C. paludicola by its glabrous style and glabrous corolla-lobes, the two latter species having the upper portion of the style densely hirsute and the corolla-lobes markedly papillose within at least toward the base. Whereas the leaves of C. paludicola are rounded at the apex, those of C. Skinneri are abruptly short-acuminate, as in the present novelty, which it further resembles in the lustrousness of the upper surface of its leaves; but the lateral nerves of C. Skinneri are more distantly spaced and fewer in number (5-8 pairs).

In its glabrous style C. Holdridgei is more closely allied to the widely distributed C. grandiflora (R. & P.) Rusby. Although variable in length, the free portion of the calyx-tube in the latter is never as short as in C. Holdridgei; the midrib on the underside of its leaves is frequently minutely hirtellous.

All the other described species of Cosmibuena are from South America, and herewith is presented a list of these:

- C. acuminata Ruiz & Pav. = Hillia parasitica Jacq. See Standley, Field Mus. Nat. Hist. Bot. 13: 48. 1936.
- C. arborea Standley = C. grandiflora. See Standley, Field Mus. Nat. Hist. Bot. 7: 23. 1930.
- C. GARDENIODES Wernh. Cauca, Colombia. Said to be "related to C. grandiflora but readily distinguished by the much shorter corolla....Corolla-tube barely 4 cm. long." The corolla-tube of the type of C. macrocarpa is about 5 cm. long. There is considerable variation in the length of the corolla-tube in the genus.
- C. gorgonensis Wernh. = C. macrocarpa. See Standley, Field Mus. Nat. Hist. Bot. 7: 24. 1930.
- C. GRANDIFLORA (R. & P.) Rusby. The most common and widely distributed South American species -- British Guiana, Venezuela, Colombia, Peru, Bolivia. In Fl. Peru. 3 (1802) 226 two

- species are described under Cosmibuena, C. obtusifolia and C. acuminata. The former is a synonym of C. grandiflora, the type species of the genus. Standley, in N. Am. Fl. 32 (1921) 115, cited C. acuminata as the type species, but this species does not belong in Cosmibuena (as can readily be seen from the original illustration). First described in 1799 by Ruíz and Pavón as Cinchona grandiflora, the type species was subsequently recognized by them as belonging to Cosmibuena, although they failed to make the proper transfer.
- C. latifolia Klotzsch ex Walp. = C. grandiflora. See Standley, Field Mus. Nat. Hist. Bot. 7: 23. 1930.
- C. MACROCARPA (Benth.) Klotzsch ex Walp. Gorgona Island, Colombia. Style hirsute.
- C. obtusifolia Ruíz & Pav. = C. grandiflora. The specific epithet obtusifolia was substituted for the earlier grandiflora by Ruíz and Pavón.
- C. obtusifolia var. latifolia (Benth.) Hook. f. = C. grandiflora. See Standley, Field Mus. Nat. Hist. Bot. 7: 23. 1930.
- C. ochracea Endl. = Ladenbergia hexandra (Pohl) Klotzsch.
- C. quinquefolia Klotzsch = C. grandiflora. See Standley, Field Mus. Nat. Hist. Bot. 7: 366. 1931.
- C. RHIZOPHORAE Standley. El Valle, Colombia. Leaf-blades 3--5 cm. long, 2--3.5 cm. broad.
- C. triflora (Benth.) Klotzsch = C. grandiflora, probably. Iso-type at the New York Botanical Garden.

There is justification for conserving the rubiaceous genus Cosmibuena Ruíz & Pavón of Fl. Peru. 3 (1802) 3, although the case in favor of this is not very good. The earlier Cosmibuena of Ruíz and Pavón of Prod. Fl. Peru. (1794) 10 is a synonym of Hirtella L. (Rosaceae). Notwithstanding the fact that of the two species described under the 1802 genus one belongs in Hillia, a close relative of Cosmibuena, the given combination of generic characters defines the genus fairly well. Furthermore, the earlier of the two species, the type species, which furnished the seed character, is unmistakably a Cosmibuena. The Buena published by Pohl in 1827 to substitute for Cosmibuena R. & P. Fl. Peru. sed non Prodr., has been referred principally to Ladenbergia (1846), to which belongs B. hexandra, the only species of Buena described by Pohl. Regardless of this disposition, the nomenclatural type of Pohl's genus is based on Cosmibuena R. & P. of 1802. However, Buena Pohl is also a later homonym, antedated by Buena Cavanilles (Anal. Hist. Nat. Madrid 2: 278, pl. 23. 1800), a synonym of Gonzalagunia R. & P. (Fl. Peru. Prodr. 12, pl. 3. 1794). If Cosmibuena R. & P. (1802) is not conserved it will be necessary to propose a new generic name for the group and make approximately seven specific transfers.

LAXOPLUMERIA AND A NOTE ON BOTANICAL APPROACH

Joseph V. Monachino

The present study has proved that Laxoplumeria has an apocarpous ovary surrounded at the base by an annular disk with two lobes opposite the sutures between the carpels and that the fruit is of two long follicular mericarps containing numerous lanose seeds. The known species are three, distributed in the upper Amazon valley and extending from northeastern Peru, in the basin of the upper Marañon, to the northwestern area of the state of Matto Grosso in Brazil, in the basin of the upper Rio Madeira. They are very closely related, and comprise, besides the type species (which has been hitherto misinterpreted) and a species originally placed in Tonduzia, a novelty which is described below.

LAXOPLUMERIA Mgf., in Notizbl. 9: 981. 1926.

Bisquamaria Pichon, in Bull. Mus. Hist. Nat. Paris, ser. 2, 19: 299. 1947.

Laticiferous trees; leaves alternate; inflorescences apparently terminal, many-flowered, the bracts minute; calyx eglandular; corolla small, the tube cylindrical, the lobes linear, longer than the tube, the left margins overlapping; anthers free, lanceolate, dehiscent the full length; disk surrounding base of ovary annular, low, with two lobes opposite the sutures of the carpels; ovary apocarpous, glabrous, the ovules numerous, in 5-6 ranks; style filiform, the clavuncle indusiate above and tunicate below, the stigmatic apiculi conic, acute; fruit of two long follicular mericarps, the seeds numerous, flat, invested with long hairs.

Type species: L. Tessmannii Mgf.

The genus belongs with the "Plumierioideae - Plumiereae - Alstoniinae" of K. Schumann's treatment of the Apocynaceae in Engler & Prantl's "Die Natürlichen Pflanzenfamilien" 4 (2): 135 (1895). I cannot suggest any very close generic relative. A key to the species follows:

1. Inflorescences puberulent, long and ample; calyx-lobes less than 1 mm. long; filaments attached manifestly above middle of corolla-tube; petioles about 3 cm. long...L. Tessmannii.
1. Inflorescences glabrous.....2
2. Inflorescences abbreviated, 4 cm. or less long; calyx-lobes 1-2 mm. long; filaments attached at about the middle of the corolla-tube; leaf-blades glabrous; petioles about 3-4 cm. long.....L. Baehniiana.
2. Inflorescences long, over 10 cm. long; calyx-lobes less

than 1 mm. long; filaments attached a little above the middle of the corolla-tube; petioles very short, the decurrent base of the blade extending almost to the stem...
L. macrophylla.

Except for the apocarpous ovary and his oversight of the disk, Markgraf's description of L. Tessmannii well characterizes the species. L. macrophylla was excellently described, but in the genus Tonduzia and consequently a new combination is necessary. The isotype of this species deposited in the United States National Herbarium was examined by me.

LAXOPLUMERIA MACROPHYLLA (Kuhlm.) Monachino, comb. nov.

Tonduzia macrophylla Kuhlm., in Archiv. Jard. Bot. Rio de Janeiro 5: 208. 1930.

Bisquamaria macrophylla Pichon, in Bull. Mus. Hist. Nat. Paris, ser. 2, 19: 300. 1947.

LAXOPLUMERIA BAEHNIANA Monachino, sp. nov.

Arbor L. Tessmannii et L. macrophylla valde affinis; foliis glabris; petiolis 3--4 cm. longis; inflorescentiis abbreviatis glabris; lobis calycis 1--2 mm. longis; staminibus prope mediam tubi corollae adfixis.

Laticiferous tree, the branchlets ridged, the young growth resinous; leaves alternate; petioles 3--4 cm. long; blades oblanceolate, 11--30 cm. long, 4--10 cm. broad, rounded or obtuse at apex, greatly tapering into the petiole at base, glabrous, the principal lateral nerves 15--24 pairs, arcuate, the reticulation moderately close, not prominent; inflorescence apparently terminal, sessile, cymose, resinous, glabrous, its branches alternate, divaricate, the pedicels up to 3 mm. long; calyxlobes ovate-oblong, 1--2 mm. long, obtuse, resinous, glabrous, glandular; corolla-tube cylindric, about 4 mm. long, glabrous outside, pilose within; corolla-lobes greatly twisted in bud, the left margin overlapping, linear, at maturity about 11 mm. long, 1.3 mm. broad, pilose within toward the base; stamens attached near the middle of the corolla-tube, the filaments short, the anthers lanceolate, polleniferous the whole length; disk surrounding base of ovary annular, low, with two lobes opposite the sutures of the carpels; ovary apocarpous, superior, slightly depressed at apex, several-ridged dorsally, glabrous; ovules numerous, in about 4 series in each carpel; style filiform, 1--1.5 mm. long; clavuncle cylindric, about 0.6 mm. long, indusiate at apex and tunicate at base (at maturity); stigmatic apiculi conic, about 0.3 mm. long, acute, microscopically papillose; follicles (Krukoff 5720) suggestive of Alstonia, about 38 cm. long, glabrous; seeds numerous, elliptic, acute at the ends, about 22 mm. long and 3 mm. broad, densely pilose on the abaxial surface, the hairs long, 10--15 mm. long,

brown; embryo in middle of seed, the radicle about 4 mm. long, the cotyledons flat, lanceolate, about 8 mm. long.

Type: Ricardo de Lemos Froes 21694, basin of the upper Rio Jurua, Valparaiso, Iq. Campinas, munic. Eirunepe, state of Amazonas, Brazil, in high forest at border of creek, October 26, 1946; tree 30 feet high, 8 inches in diameter, latex abundant. Deposited in the Britton Herbarium at the New York Botanical Garden.

Additional specimens examined: B. A. Krukoff 5720, basin of Rio Purus, near mouth of Rio Macauhan (tributary of Rio Yaco), lat. $9^{\circ}20'$ S, long. 69° W, territory of Acre, Brazil, on terra firma, August 27, 1933; tree 110 feet high, 3 feet in diameter. Deposited in the Britton Herbarium at the New York Botanical Garden. As this collection consists of fruiting material only, its specific identification is not positive.

This species is named in honor of Dr. Charles Bæhni, of the Conservatoire Botanique at Geneva, who made possible the conclusions arrived at in the present revision by sending me several flowers of an isotype of L. Tessmannii.

It might prove profitable to sketch here the history of the identification of L. Bæhniana. The recital will demonstrate the reward (from the standpoint that a faithful contribution to the science of taxonomy is its own reward) of exhaustive investigation in describing new plants or proposing new names, and will serve as a commentary upon botanical approach.

An attempt was made to identify the present novelty early in 1947. The habit of the plant recalled L. Tessmannii, of which a photograph of the type is available at the New York Botanical Garden. When the description of L. Tessmannii was read, to my astonishment, several important discrepancies were noted, the most important of which was that of the alleged syncarpous ovary. The ovary in Froes 21694 is clearly apocarpous.

With the exception of the original description in the "Notizblatt" little direct information was found regarding Laxoplumeria. M. Pichon (Bull. Mus. Hist. Nat. Paris, ser. 2, 19: 362. 1947) did not hesitate to place the genus in the synonymy of Aspidosperma, although he had not seen material of Laxoplumeria. He relied, apparently, on the description of the syncarpous ovary. Markgraf also suggested an affinity of his genus with Aspidosperma, probably as a result of erroneous observation of the flower structure and lack of information regarding the fruit.

Search for an isotype of L. Tessmannii in the Bassler Herbarium was unsuccessful. Through the intermediation of Dr. H. N. Moldenke inquiries were addressed to many institutions concerning the availability of Laxoplumeria material. The species was not found in any of the American herbaria. Correspondence with the curators of the herbaria at Munich and at Stockholm was equally fruitless. In response to an inquiry, Tessmann himself

replied that he had no duplicates of this collection.

A fragment of Froes 21694 was mailed to Markgraf, who, in his letter of January 9, 1948, wrote that the plant did not agree with Laxoplumeria and should constitute a new genus. He dwelled at some length on the important differences the Froes plant showed from Laxoplumeria: the insertion of the stamens, the shape of the anthers and stigma, and the character of the ovary.

With the description of Laxoplumeria disagreeing with my plant in some important characters, with the apparent loss of the only known herbarium voucher for Laxoplumeria, and with the author of the genus denying any generic tie between the two plants, there seemed, indeed, to be justification for the erection of a new apocynaceous genus. But mindful of how

"The Moving Finger writes; and, having writ,
Moves on: nor all thy Piety nor Wit
Shall hire it back to cancel half a Line,
Nor all thy Tears wash out a Word of it,"

doggedly skeptical, and still not satisfied with the case for proposing or accepting a new genus, I addressed two queries to Markgraf: did he base the differences stated between Froes 21694 and Laxoplumeria on actual material comparison of the two or did he rely on his memory for Laxoplumeria? And, secondly, was it ascertained that the actual type of L. Tessmannii had been destroyed in the bombing of Berlin? Markgraf replied (his letter of November 19, 1948) that Dr. Mattfeld of Dahlem confirmed that the type had been burned up completely and there were no duplicates. The fragment of Froes 21694 had been compared with the printed description only and reliance had been based on memory. Markgraf, however, now reversed his previous conclusion: he added that, although he had at first suggested that Froes 21694 should typify a new genus, it now occurred to him to be not very probable that two genera with similar leaf arrangement of an exceptional character in the Apocynaceae, together with similar form of inflorescence and shape of flowers, would occur in the same region without any other essential difference than the ovary. He would now propose, therefore, to call my material L. Tessmannii.

In the meantime exhaustive search for an isotype of Laxoplumeria was finally rewarded by success. The herbarium at Geneva was the last possible depository where the Tessmann collection might be had, and the last attempt was successful. The examination of a few flowers of the isotype of L. Tessmannii there preserved settled within an hour the matter of identification and thus finally terminated my two years' search.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, AND SYMPHOREMACEAE.
SUPPLEMENT 10

Harold N. Moldenke

Since the preparation of the ninth supplement to this list in July, 1948, over three thousand additional specimens of these groups have been examined and annotated from the United States National Herbarium at Washington, the Erik Wall Herbarium at Stockholm, the Fritz Lemperg Herbarium at Hatzendorf, Austria, the J. T. Roig Herbarium at Santiago de la Vegas, Cuba, the Britton Herbarium at the New York Botanical Garden, the Herbarium Boissier at Geneva, the H. N. Moldenke Herbarium at Watchung, New Jersey, and the herbaria of the Canal Zone Biological Area on Barro Colorado Island, the Facultad Nacional de Agronomia at Medellin, Colombia, the Academia de Ciencias at Havana, the College of Pharmacy at New York City, the Faculdade de Farmacia e Odontologia at São Paulo, the California Academy of Sciences at San Francisco, the United States Field Station at Sacaton, Arizona, the Naturhistoriska Riksmuseet at Stockholm, the Chicago Natural History Museum, the Instituto Darwinion at San Isidro, Argentina, the Conservatoire et Jardin Botaniques at Geneva, the Museu Nacional at Rio de Janeiro, the Royal Botanic Gardens at Kew, the Missouri Botanical Garden at St. Louis, the Estacion Experimental Agronomica at Santiago de las Vegas, Cuba, the Museo Comercial de Venezuela at Caracas, the Philadelphia Academy of Sciences, the Museo Paranaense at Curitiba, Brazil, the University of Georgia, the University of Tennessee, Butler University, Columbia University, and Princeton University. This wealth of material has brought to light 60 new county or parish records, 173 new state, province, or department records, and 131 new country or island records, as well as the necessity for making certain emendations in previous records and certain nomenclatural changes hereinafter noted.

UNITED STATES OF AMERICA:

Maine:

Verbena bracteata Lag. & Rodr. (Penobscot County)

Verbena hastata L. (Androscoggin, Franklin, Kennebec, Knox, Lincoln, Sagadahoc, & Somerset Counties)

New York:

Verbena hastata L. (Fulton County)

Delaware:

Verbena stricta Vent. (New Castle County)

South Carolina:

Callicarpa americana L. (Darlington County)

Georgia:

Styloclon carneus (Medic.) Moldenke (Dodge, Laurens, & Toombs Counties)

Verbena bonariensis L. (Grady County)

Verbena bracteata Lag. & Rodr. (Screven County)

Verbena canadensis (L.) Britton (Randolph County)

Verbena rigida Spreng. (Grady, Greene, Jackson, & Lamar Counties)

Verbena simplex Lehm. (Bartow, Cherokee, Dade, & Floyd Counties)

Verbena tenuisecta Briq. (Baker, Bulloch, Effingham, Irwin, Laurens, Screven, Tatnall, & Treutlen Counties)

Verbena tenuisecta var. alba Moldenke (Grady County)

Verbena urticifolia L. (Bartow County)

Florida:

Callicarpa americana L. (Franklin County)

Illinois:

Phyla cuneifolia (Torr.) Greene (Menard County)

Verbena bracteata Lag. & Rodr. (McHenry County)

xVerbena illicita Moldenke (Menard County)

xVerbena Rydbergii Moldenke (Pulaski County)

Indiana:

Verbena simplex Lehm. (Hancock County)

Verbena atricla Vent. (Pulaski County)

Tennessee:

Phyla lanceolata (Michx.) Greene (Montgomery County)

North Dakota:

Verbena urticifolia var. leiocarpa Perry & Fernald (Richland County)

Louisiana:

Styloclon carneus (Medic.) Moldenke (Rapides Parish)

Verbena canadensis (L.) Britton (Tensas Parish)

Nebraska:

Verbena bracteata Lag. & Rodr. (Antelope County)

Oklahoma:

Phyla lanceolata (Michx.) Greene (Custer & Gaddo Counties)

Texas:

Aloysia lycioides var. Schulzii (Standl.) Moldenke (Bexar County)

Lantana horrida H.B.K. (Wilson County)

Phyla incisa Small (Wilson County)

Tetradlea Coulteri A. Gray (Crockett County)

Verbena bipinnatifida Nutt. (Wilson County)

Verbena Halei Small (Henderson County)

Verbena rigida Spreng. (Lee County)

Verbena xutha Lehm. (Lee County)

New Mexico:

Bouchea linifolia A. Gray

Verbena Wrightii A. Gray (Quay County)

California:

Phyla lanceolata (Michx.) Greene (Inyo County)

Verbena canescens var. Roemeriana (Scheele) Perry (San Diego County)

MEXICO:

Lantana glandulosissima Hayek (Chiapas)

Phyla nodiflora var. canescens (H.B.K.) Moldenke (Coahuila)

Phyla strigulosa (Mart. & Gal.) Moldenke (Chiapas)

Verbena bracteata Lag. & Rodr. (San Luis Potosí)

Verbena cameronensis L. I. Davis (Hidalgo)

Verbena gracilis Desf. (Veracruz)

Verbena Hintoni Moldenke (México)

Verbena scabra Vahl (Chihuahua)

GUATEMALA:

Verbena ciliata Benth. (Quezaltenango)

HONDURAS:

Lantana Camara var. flava (Medic.) Moldenke (Tegucigalpa)

Lantana velutina Mart. & Gal. (Tegucigalpa)

Lippia controversa Moldenke (Tegucigalpa)

Stachytarpheta Frantzii Polak. (Tegucigalpa)

PANAMA:

Aegiphila panamensis Moldenke (Barro Colorado Island)

Petrea aspera Turcz. (Barro Colorado Island)

Petrea volubilis L. (Barro Colorado Island)

BAHAMAS:

Avicennia nitida Jacq. (North Bimini)

Lantana involucrata L. (North Bimini)

Phyla nodiflora var. reptans (H.B.K.) Moldenke (North Bimini)

Stachytarpheta jamaicensis (L.) Vahl (North Bimini)

CUBA:

Duranta Wrightii Moldenke*

Lantana Camara var. rubella Moldenke (Havana)*

Phyla scaberrima (A. L. Juss.) Moldenke (Camaguey)

Pseudocarpidium ilicifolium (A. Rich.) Moldenke (Camaguey)

Stachytarpheta mutabilis (Jacq.) Vahl

Vitex Negundo var. intermedia (P'ei) Moldenke (Havana)

TORTUGA:

Avicennia nitida Jacq.

COLOMBIA:

Glerodendrum Thomsonae Balf. f. (Antioquia)

Lantana armata Schau. (Antioquia & Tolima)

Lantana glandulosissima Hayek (Magdalena)

Lantana trifolia L. (Putumayo)

Phyla scaberrima (A. L. Juss.) Moldenke (Putumayo)

Verbena hybrida Voss (Antioquia)

Vitex orinocensis var. multiflora (Miq.) Huber (Amazonas)

VENEZUELA:

Amasonia campestris (Aubl.) Moldenke (Anzoategui, Guarico, &

Monagas)

- Avicennia nitida Jacq. (Anzoategui & Falcón)
Lantana Camara L. (Miranda)
Lantana Camara var. mista (L.) L. H. Bailey (Miranda)
Lantana canescens H.B.K. (Zulia)
Lantana glutinosa Poepp. (Sucre)
Lippia micromera Schau. (Monagas)
Phyla scaberrima (A. L. Juss.) Moldenke (Carabobo)
Stachytarpheta urticaefolia (Salisb.) Sims (Monagas)
Vitex capitata Vahl (Amazonas)
Vitex Wittrockiana Moldenke is to be deleted

SURINAM:

- Lantana armata Schau.
Stachytarpheta elatior Schrad.

ECUADOR:

- Lantana cujabensis Schau. (Los Rios)
Lantana Moritziana Otto & Dietr. (Los Rios & Napo-Pastaza)
Lantana rugulosa f. albiflora Moldenke (Esmeraldas)*
Lantana trifolia L. (Los Rios & Napo-Pastaza)

PERU:

- Verbena parvula Hayek (Cuzco, Junín, & Tacna)

BRAZIL:

- Aegiphila chrysantha Hayek (Maranhão)
Aegiphila fluminensis Vell. (Espírito Santo)
Aegiphila mattogrossensis Moldenke (Mattogrosso)*
Aegiphila minasensis Moldenke (Minas Geraes)*
Aegiphila pernambucensis Moldenke (Ceará)
Aegiphila vitelliniflora Klotzsch (Ceará & Espírito Santo)
Aloysia polygalaeifolia Cham. (Paraná)
Aloysia ternifolia Moldenke (Paraná)
Bouchea chascanoides Moldenke (Minas Geraes)*
Bouchea fluminensis var. pilosa Moldenke (Paraná)
Citharexylum Reitzii Moldenke (Santa Catharina)*
Citharexylum solanaceum var. macrocalyx Moldenke (Rio Grande do Sul)
Lantana chamaedrifolia Cham. (Rio Grande do Sul)
Lantana fucata Lindl. (Distrito Federal & Santa Catharina)
Lantana minasensis Moldenke (Espírito Santo)
Lantana robusta Schau. (Minas Geraes)
Lantana tiliaefolia Cham. (Paraná)
Lippia Bradei Moldenke (Minas Geraes)*
Lippia imbricata Kuntze (Rio Grande do Sul)
Lippia pumila Cham. (Bahia)
Stachytarpheta australis f. albiflora Moldenke (São Paulo)*
Stachytarpheta lactea Schau. (Amazonas)
Verbena bonariensis L. (Distrito Federal, Rio Grande do Sul, & Santa Catharina)
Verbena hirta Spreng. (Santa Catharina)
Verbena hirta var. gracilis Dusén (Rio Grande do Sul)

Verbena humifusa var. reticulata Moldenke is to be deleted

xVerbena hybrida Voss (Distrito Federal)

Verbena Lindmanii Briq. can no longer be regarded as endemic to Brazil, since it is now known from Argentina

Verbena litoralis H.B.K. (Distrito Federal)

Verbena lobata Vell. (Rio de Janeiro)

Verbena marrubioides Cham. (Paraná)

Verbena pulchella Sweet (São Paulo)

Verbena pulchra Moldenke (São Paulo)

Verbena scrobiculata Griseb. (Santa Catharina)

Verbena Tessmannii Moldenke (Paraná)*

Vitex capitata Vahl (Amazonas)

Vitex rufescens A. L. Juss. (Rio de Janeiro)

Vitex rufescens var. abludens (Moldenke) Moldenke (Parahyba)

Vitex Wittrockiana Moldenke is to be deleted

BOLIVIA:

Lippia alba (Mill.) N. E. Br. (La Paz)

Verbena Bangiana Moldenke (La Paz)*

Verbena parvula Hayek (El Beni); this species can no longer be regarded as endemic to Bolivia, since it has been found recently in Peru

Vitex triflora Vahl (El Beni)

PARAGUAY:

Lippia contermina Briq. can no longer be regarded as endemic to Paraguay, as it has been found in Argentina

Verbena intercedens Briq. can no longer be regarded as endemic to Paraguay, as it has been found in Argentina

Verbena Kuntzeana Moldenke*

URUGUAY:

Verbena pulchra var. paludicola Moldenke*

CHILE:

Acantholippia trifida (C. Gay) Moldenke (Atacama)*

Junellia illapelina (R. A. Phil.) Moldenke (Ovalle)

Junellia uniflora (R. A. Phil.) Moldenke can no longer be regarded as endemic to Chile, as it has been found in Argentina

Verbena araucana R. A. Phil. (Santiago)

Verbena Berterii (Meisn.) Schau. (Aconcagua)

Verbena lipozygoides Walp. (Santiago)

Verbena Paulseni R. A. Phil. (Santiago)

Verbena ribifolia Walp. (Santiago)

ARGENTINA:

Acantholippia trifida (C. Gay) Moldenke is to be deleted

Aloysia lycioides Cham. (Formosa)

Aloysia lycioides var. paraguariensis (Briq.) Moldenke (Cata-marca, Mendoza, & Santiago del Estero)

Aloysia ovatifolia Moldenke (Mendoza)

Aloysia Schulziana Moldenke (Córdoba & Mendoza)

Aloysia scorodonioides var. detonsa (Briq.) Moldenke (Formosa)

Aloysia ternifolia Moldenke can no longer be regarded as endemic to Argentina, since it has been found in Brazil
Aloysia virgata var. elliptica (Briq.) Moldenke (Misiones)
Aloysia virgata var. platyphylla (Briq.) Moldenke (Corrientes & Formosa)

Junellia Echegarayi (Hieron.) Moldenke (San Luis)
Junellia erinacea (Gill. & Hook.) Moldenke (Mendoza)
Junellia juniperina (Lag.) Moldenke (Salta)
Junellia tripartita Moldenke (Mendoza)*
Junellia uniflora (R. A. Phil.) Moldenke (Mendoza)
Lippia contermina Briq. (Misiones)
Lippia salsa Griseb. (Mendoza & San Luis)
Lippia turbinata f. angustifolia Osten (Mendoza & San Luis)
Lantana xenica Moldenke (San Luis)
Neosparton ephedroides Griseb. (Mendoza & Salta)
Phyla nodiflora var. rosea (D. Don) Moldenke (San Luis)
Verbena aurantiaca Speg. (Chubut)
Verbena crithmifolia Gill. & Hook. (San Juan)
Verbena glandulifera Moldenke (Catamarca & Córdoba)*
Verbena hispida Ruz & Pav. (Mendoza & San Juan)
Verbena intercedens Briq. (Misiones)
Verbena intermedia Gill. & Hook. (Entre Rios, Misiones, & Santa Fé)
Verbena Lindmanii Briq. (Misiones)
Verbena litoralis H.B.K. (Jujuy)
Verbena origenes var. Semperii Moldenke (Mendoza)*
Verbena ribifolia Walp. (Catamarca)
Verbena scrobiculata Griseb. (Salta)
Verbena sessilis (Cham.) Kuntze (Formosa)

MADEIRA:

Lantana Camara var. aculeata (L.) Moldenke

HUNGARY:

Verbena supina f. erecta Moldenke

ITALY:

Phyla nodiflora var. reptans (H.B.K.) Moldenke

CYPRUS:

Phyla nodiflora (L.) Greene

CRETE:

Phyla nodiflora (L.) Greene

OSSERO ISLAND:

Vitex Agnus-castus L.

MOROCCO:

Verbena officinalis L.

Vitex Agnus-castus L.

ALGERIA:

Phyla nodiflora var. reptans (H.B.K.) Moldenke

EGYPT:

Lantana viburnoides (Forsk.) Vahl

ABYSSINIA:

Lantana viburnoides var. Schimperii Moldenke*

Phyla nodiflora var. reptans (H.B.K.) Moldenke

CAMEROONS:

Lantana Camara var. aculeata (L.) Moldenke

Lantana Mearnsii var. latibracteolata Moldenke

KENYA:

Lantana Camara var. aculeata (L.) Moldenke

ANGOLA:

Lantana angolensis Moldenke (Mossamedes)*

NORTHERN RHODESIA:

Lippia Oatesii Rolfe is to be deleted

SOUTHERN RHODESIA:

Lantana rugosa Thunb.

Lantana viburnoides (Forsk.) Vahl

BRITISH NYASALAND PROTECTORATE:

Lantana scabrifolia Moldenke

SOUTHWEST AFRICA:

Lantana Dinteri Moldenke*

Lantana rugosa Thunb.

Lantana salvifolia Jacq. is to be deleted

Lippia africana Moldenke

UNION OF SOUTH AFRICA:

Lantana Camara var. aculeata (L.) Moldenke (Cape of Good Hope)

Lantana rugosa Thunb. (Basutoland, British Bechuanaland, Cape of Good Hope, Natal, & Transvaal)

Lantana rugosa var. tomentosa Moldenke (Cape of Good Hope, Natal, & Transvaal)*

Lantana salvifolia Jacq. is to be deleted

Lantana viburnoides (Forsk.) Vahl (Transvaal)

Lippia africana var. scaberrima Moldenke (Cape of Good Hope)*

Lippia scaberrima Sond. (Cape of Good Hope)

INDIA:

Lantana Camara L. (Bengal)

Lantana Camara var. nivea (Vent.) L. H. Bailey (Bengal)

Lantana crenulata Otto & Dietr. (Madras); this species can no longer be regarded as endemic, since it occurs also in Pakistan

Lantana indica Roxb. (Mysore)

Lantana rugosa Thunb. (Mysore, Punjab, & United Provinces)

Lantana salvifolia Jacq. is to be deleted

Tectona grandis L. f. (Bombay)

PAKISTAN:

Clerodendrum serratum (L.) Moon (Northwestern Provinces)

Lantana crenulata Otto & Dietr. (Northwestern Provinces)

Vitex Negundo L. (Northwestern Provinces)

BURMA:

Lantana indica Roxb. (Upper Burma)

Lantana rugosa Thunb. (Upper Burma)

Lantana salvifolia Jacq. is to be deleted

Phyla nodiflora (L.) Greene

CEYLON:

Lantana rugosa Thunb.Lantana salvifolia Jacq. is to be deleted

MANCHUKUO:

Clerodendrum trichotomum var. ferrugineum Nakai

KOREA:

Clerodendrum trichotomum var. ferrugineum Nakai

JAPAN:

Callicarpa japonica Thunb. (Yezo)Clerodendrum trichotomum var. ferrugineum Nakai (Honshiu)Phyla nodiflora (L.) Greene (Kiushiu)

MACAO:

Clerodendrum canescens Wall.Clerodendrum Lindleyi Decaisne is to be deleted

FRENCH INDO-CHINA:

Lantana rugosa Thunb. (Cambodia)Lantana salvifolia Jacq. is to be deleted

THAILAND:

Lantana Camara var. mista (L.) L. H. Bailey

STRAITS SETTLEMENTS:

Lantana Camara var. nivea (Vent.) L. H. Bailey (Singapore)Lantana trifolia L. (Singapore)Phyla nodiflora (L.) Greene (Singapore)

PHILIPPINE ISLANDS:

Lantana Camara var. aculeata (L.) Moldenke (Cebu)

CELEBES:

Lantana Camara var. aculeata (L.) Moldenke

NEW HEBRIDES:

Phyla nodiflora (L.) Greene (Aneityum)

FIJI ISLANDS:

Clerodendrum inerme (L.) Gaertn. (Vanua Levu)Faradaya vitiensis var. puberulenta Moldenke (Viti Levu)*Gmelina vitiensis Seem. (Viti Levu)Premna Gaudichaudii Schau. (Vanua Levu)Premna taitensis var. marchionica F. H. Br. (Vanua Levu)Vitex trifolia L. (Vanua Levu)Vitex trifolia var. bicolor (Willd.) Moldenke (Vanua Levu)

SAMOA:

Vitex trifolia var. bicolor (Willd.) Moldenke (Upolu)

AUSTRALIA:

Lantana tiliaefolia Cham. (New South Wales)

CULTIVATED:

Aloysia lycioides Cham. (Argentina)Aloysia triphylla (L'Hér.) Britton (Chile, Colombia, & Spain)Aloysia virgata var. elliptica (Briq.) Moldenke (Cuba & Uruguay)Clerodendrum trichotomum var. ferrugineum Nakai (California, District of Columbia, Massachusetts, New York, Oregon,

& Pennsylvania)

Clerodendrum trichotomum var. tomentosum Moldenke is to be deleted

Clerodendrum ugandense Prain (Cuba & Fiji Islands)

Congea tomentosa Roxb. (Canal Zone & Dominica)

Duranta repens L. (Guatemala & Palestine)

Duranta repens var. alba (Masters) L. H. Bailey (Fiji Islands)

Gmelina arborea Roxb. (California)

Gmelina asiatica L. (California)

Holmskioldia sanguinea Retz. (Cuba & Mexico)

Holmskioldia speciosa Hutch. & Corbish. (Natal)

Lantana Camara L. (Cuba, Java, Massachusetts, Mexico, & Palestine)

Lantana annua L. (Germany)

Lantana Camara var. aculeata (L.) Moldenke (Java & New York)

Lantana Camara var. hybrida (Neubert) Moldenke (Sweden)

Lantana Camara var. nivea (Vent.) L. H. Bailey (India)

Lantana Camara f. parvifolia Moldenke (New York)

Lantana crenulata Otto & Dietr. (India)

Lantana fucata Lindl. (Chile)

Lantana glandulosissima Hayek (Mexico & Guatemala)

Lantana glutinosa Poepp. (Argentina)

Lantana rugosa Thumb. (Belgium, England, & Germany)

Lantana salvifolia Jacq. is to be deleted

Lippia alba (Mill.) N. E. Br. (Brazil)

Petitia domingensis Jacq. (Cuba)

Petrea volubilis L. (Massachusetts)

Phyla nodiflora var. rosea (D. Don) Moldenke (Argentina)

Phyla scaberrima (A. L. Juss.) Moldenke (Cuba, Russia, & Sweden)

Verbena bipinnatifida Nutt. (Massachusetts)

Verbena canadensis (L.) Britton (Connecticut)

xVerbena hybrida Voss (Argentina)

Verbena tenera Spreng. (Delaware & Hawaiian Islands)

Vitex divaricata var. cubensis Urb. (Cuba)

Vitex trifolia var. variegata Moldenke (Bahamas)

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
ERIOCAULACEAE. SUPPLEMENT 4

Since the preparation of the previous supplement to this list another thousand specimens of this group have been examined and annotated from the United States National Herbarium at Washington, the Fritz Lemperg Herbarium at Hatzendorf, Austria, the J. T. Roig Herbarium at Santiago de las Vegas, Cuba, and the herbaria of the Facultad Nacional de Agronomia at Medellin,

Colombia, the College of Pharmacy at New York City, the Chicago Natural History Museum, the Estacion Experimental Agronomia at Santiago de las Vegas, Havana, the Faculdade de Farmacia e Odontologia at São Paulo, and the New York Botanical Garden. The following are some of the new records thus brought to light.

NEW BRUNSWICK:

Eriocaulon septangulare With. (Kent County)

MAINE:

Eriocaulon Parkeri B. L. Robinson (Cumberland, Hancock, Kennebec, & Lincoln Counties)

Eriocaulon septangulare With. (Aroostock, Cumberland, Kennebec, Knox, Lincoln, Piscataquis, & York Counties)

SOUTH CAROLINA:

Eriocaulon compressum Lam. (Berkley County)

GEORGIA:

Eriocaulon compressum Lam. (Calhoun, Macon, Ware, & Wayne Counties)

Eriocaulon decangulare L. (Bacon, Brantley, Brooks, Bryan, Candler, Douglas, Early, Glynn, Johnson, Lanier, Miller, & Screven Counties)

Eriocaulon lineare Small (Baker & Colquitt Counties)

Lachnocaulon anceps (Walt.) Morong (Brantley, Candler, Clay, Douglas, Jeff Davis, Macon, Rabun, Screven, & Taylor Cos.)

Lachnocaulon minus (Chapm.) Small (Chatham County)

Syngonanthus flavidulus (Michx.) Ruhl. (Clinch County)

FLORIDA:

Eriocaulon compressum Lam. (Franklin County)

Eriocaulon Ravenelii Chapm. (Levy County)

Lachnocaulon anceps (Walt.) Morong (Leon County)

Lachnocaulon glabrum Körn. (Levy County)

Lachnocaulon minus (Chapm.) Small (Gadsden County)

Syngonanthus flavidulus (Michx.) Ruhl. (Dade & DeSoto Cos.)

HONDURAS:

Eriocaulon Seemannii Moldenke (Morazán)

COLOMBIA:

Paepalanthus Karstenii Ruhl. (Boyacá & El Cauca)

Tonina fluviatilis Aubl. (Antioquia)

VENEZUELA:

Paepalanthus Cardonae Moldenke (Bolívar)*

Syngonanthus acopanensis Moldenke (Bolívar)*

Syngonanthus reflexus Gleason can no longer be regarded as endemic to Venezuela, as it is now known from Brazil

BRITISH GUIANA:

Syngonanthus anomalus (Körn.) Ruhl.

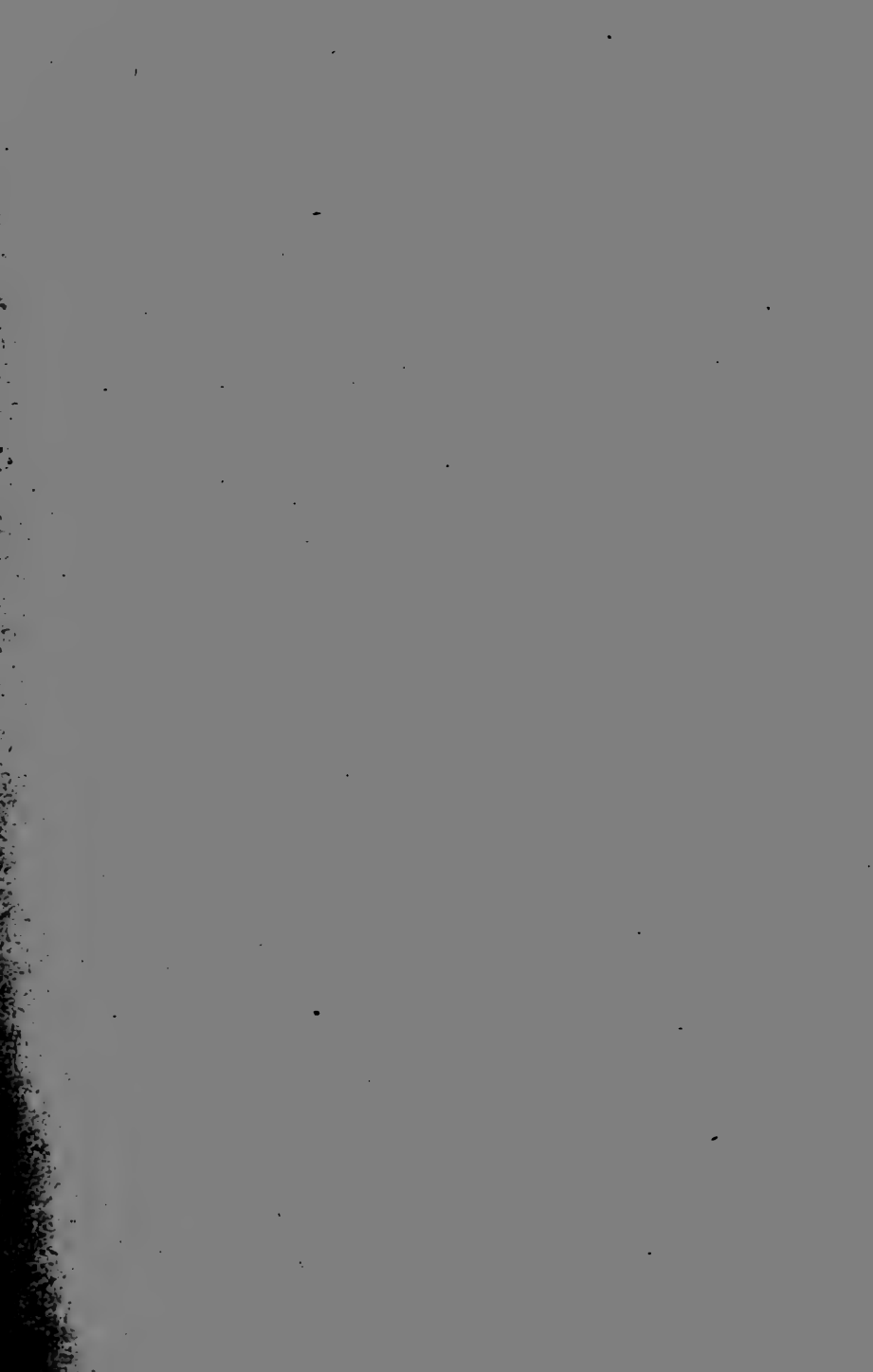
SURINAM:

Paepalanthus polytrichoides f. villosus Moldenke*

BRAZIL:

Eriocaulon modestum Kunth (Mattogrosso)

Eriocaulon Regnellii Moldenke (Minas Geraes)*



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FOUR NOMINA CONSERVANDA PROPOSALS IN FLOWERING PLANTS

Elbert L. Little, Jr.

Four generic names of flowering plants in almost universal use have been presented as nomina generica conservanda proposita for action by the forthcoming International Botanical Congress at Stockholm in 1950. They are: Castanopsis (D. Don) Spach, Darlingtonia Torr. (1853, not 1851), Dipholis A. DC., and Cosmibuena Ruiz & Pav. (1802, not 1794). As required by Article 21, Note 1, of the International Rules of Botanical Nomenclature (Ed. 3, 151 p. Jena. 1935), the detailed statements of these cases summarized here have been submitted to the Executive Committee.

E. D. Merrill (Nomenclatural notes on Rafinesque's published papers 1804-1840. Arnold Arboretum Jour. 29: 202-214. 1948) has published a list of about 88 valid but as yet not generally accepted generic names by Rafinesque which have priority over the names in use. For some of the large genera affected, Rafinesque's names should be rejected in favor of the familiar, established names, as Merrill has stated, but each name should be considered separately on its own merits. Names of only three genera of trees native in the United States are affected by Rafinesque's names in that list. Their present names are: Lithocarpus Blume (Pasanis (Miq.) Oerst.), Castanopsis (D. Don) Spach, and Dipholis A. DC. Of these, the first and possibly also the last, can be retained without action. With Merrill's kind permission, the second and last names are here proposed for conservation.

Balanaulax Raf. (Alsogr. Amer. 28. 1838) and Arcaula Raf. (Alsogr. Amer. 30. 1838) both are earlier names for Pasanis (Miq.) Oerst. (Kjoeb. Vidensk. Meddel. 1866: 81. 1867), as cited. However, the oldest name for the genus and the one now in use is Lithocarpus Blume (Bijr. Fl. Ned. Indië 526. 1825), which was established by Rehder and Wilson (in Sarg., Pl. Wilson. 3: 205. 1916). It antedates also Synaedrys Lindl. (Introd. Nat. Syst. Bot. Ed. 2, 441. 1836).

1891, partim. (Fagaceae.) CASTANOPSIS (D. Don) Spach, Hist. Vég. Phaner. 11: 185. 1842. Quercus L. [sec.?] Castanopsis D. Don, Prodr. Fl. Nepal. 56. 1825. Type sp.: Castanopsis armata Spach, loc. cit. (Quercus armata Roxb.)

Nomen rejiciendum: Balanoplis Raf., Alsogr. Amer. 29. 1838. Type sp.: B. tribuloides (Sm.) Raf., loc. cit. (Quercus tribuloides Sm. in Rees, Cycl. 29: Quercus No. 13. 1814.)

Synonym: Callaeocarpus Miq. in Junghuhn, Pl. Jungh. 13.

1851. Type sp.: Callaeocarpus sumatrana Miq., loc. cit. p. 14.

Castanopsis (D. Don) Spach is a genus of about 120 species of trees, nearly all Asiatic. C. chrysophylla (Dougl.) A. DC. and C. sempervirens (Kellogg) Dudley, the latter a shrub, are native in the Pacific coast States of the United States. This generic name was accepted by Bentham and Hooker and by Index Kewensis. Prantl (in Engler and Prantl, Natürl. Pflanzenfam. 3 (1): 55. 1888) and Dalla Torre and Harms placed it as a section, Castanea Mill. sect. Castanopsis (D. Don) Prantl. The later synonym Callaeocarpus Miq., in which only two binomials were made, is not in use.

A. Camus (Les chataigniers. Monographie des genres Castanea et Castanopsis. 604 p., illus. Paris. 1929) accepted Castanopsis as a distinct genus with 112 species. Recent authors in the United States universally have used Castanopsis for the native species.

Balanoplis Raf., published only four years before Castanopsis was elevated to generic rank, had only the two original species, B. tribuloides (Sm.) Raf. and B. serrata Raf. (loc. cit., p. 30), a substitute name for Q. cuspidata Thunb. Rafinesque's name, listed in Index Kewensis as a synonym of Quercus L., apparently was not accepted by any later authors. Revival of Balanoplis Raf. would require about 120 new combinations and would serve no useful purpose.

3131. (Sarraceniaceae.) DARLINGTONIA Torr., Smithsn. Inst. Contrib. Knowl. 6 [pt. 5]: 4, pl. 12. 1853. Type sp.: D. californica Torr., loc. cit. p. 5, pl. 12.

Non Darlingtonia DC., Ann. Sci. Nat. 4: 97. 1824. (Leguminosae.) Type sp.: D. brachyloba (Willd.) DC., loc. cit. (Aca-cia brachyloba Willd., Sp. Pl. Ed. 4, 4: 1071. 1806.)

Non Darlingtonia Torr., Amer. Assoc. Adv. Sci. Proc. 4: 191.

1851. (Styracaceae.) Type sp.: D. rediviva Torr., loc. cit.

Nomen rejiciendum: Chrysamphora Greene, Pittonia 2: 191. 1891. Type sp.: C. californica (Torr.) Greene, loc. cit.

Darlingtonia Torr. (1853, not 1851) has a single species, D. californica Torr., the California pitcher-plant, which is a perennial herb native in northern California and southwestern Oregon. This herb is also in cultivation elsewhere, chiefly as a botanical curiosity because of its insectivorous habit. Mention of this case was made in my previous note (Amer. Mid-land Nat. 33: 504-505. 1945). Earlier, both Uphof and Abrams had indicated that Darlingtonia Torr. should be conserved. However, as this name does not appear among the mimeographed proposals submitted to the American Society of Plant Taxonomists for sponsorship, it may be appropriate, therefore, to make a formal proposal here in order to insure official action.

Darlingtonia DC., which contained only six binomials, was abandoned more than one hundred years ago, after Bentham (Jour. Bot. (Hook.) 4: 356, 358. 1842) made it a synonym of Desmanthus Willd. (Sp. Pl. Ed. 4, 4: 1044. 1806), nom. conserv. Noting this action, Torrey in 1851 dedicated an "anomalous genus, apparently Bombaceous," to the American botanist, Dr. William Darlington, doubtless the same person De Candolle had honored earlier. This name with its single species, Darlingtonia rediviva Torr., was published in the following, generally overlooked abstract, which was not cited in Index Kewensis: Torrey, John. On some new plants discovered by Col. Fremont, in California. Amer. Assoc. Adv. Sci. Proc. 4: 190-193. 1851. All the names of this abstract except Darlingtonia appeared also in the longer, illustrated article: Torrey, John. Plantae Frémontianae; or, descriptions of plants collected by Col. J. C. Frémont in California. Smiths. Inst. Contrib. Knowl. "5 (1)" [6 (2)], 24 p., illus. 1853.

However, Torrey adopted the name Darlingtonia again for a different genus in another publication of the series: Torrey, John. On the Darlingtonia californica, a new pitcher plant from northern California. Smiths. Inst. Contrib. Knowl. 6 (4): 1-8, pl. 12. 1853. Here he explained that the Californian plant to which he had assigned this name from imperfect specimens proved to be only a species of Styrax, which he now named S. californicum Torr. (p. 4).

Incidentally, in reviews of these articles in November 1853, Asa Gray (Amer. Jour. Sci. Arts, ser. 2, 16: 424-425. 1853) cited also the published abstract and placed the date of publication of the separate article on Darlingtonia californica as "early last summer." Darlingtonia and other names in the abstract were mentioned in my note (Amer. Midland Nat. 33: 504-505. 1945). Independently, L. C. Wheeler cited this abstract and transferred Darlingtonia rediviva Torr. to Styrax rediviva (Torr.) L. C. Wheeler (So. Calif. Acad. Sci. Bul. 44: 94. 1946).

Fearing that Darlingtonia DC. might be revived from synonymy "any day," Greene renamed Darlingtonia Torr. (1853) as Chrysamphora. However, the available name Chrysamphora Greene has been used by very few authors, including: Thomas A. Howell, Flora of Northwest America 30. 1903. Edgar T. Wherry in Mary Vaux Walcott, Illustrations of North American Pitcherplants, p. 3, pl. 1. 1935.

Darlingtonia Torr. (1853) was accepted by Bentham and Hooker, Engler and Prantl, Index Kewensis, and Dalla Torre and Harms and is in almost universal usage. Index Londonensis cited 45 illustrations under Darlingtonia and only 1 under Chrysamphora, and the Supplement listed 1 illustration for each.

Floras covering its native range have adopted Darlingtonia, as have the following monographs in Sarraceniaceae: J. M. Macfarlane, Sarraceniaceae. Pflanzenreich 4 (110): 25-26. 1908.

Roland M. Harper, The American pitcher-plants. Elisha Mitchell Sci. Soc. Jour. 34: 110-125, illus. 1918. J. C. T. Uphof, Sarraceniaceae. In Engler, A., and Harms, H. Natürl. Pflanzenfam. Ed. 2, 17b: 724. 1936.

Francis E. Lloyd devoted a chapter in his book, The Carnivorous Plants (352 p., illus. Waltham, Mass. 1942), to this species under the heading "Darlingtonia californica." However, in the first paragraph (p. 40) he explained that Darlingtonia was used because of its wide familiarity and use in horticultural literature, though under the International Rules the name is invalid as a later homonym and is to be replaced by Chrysamphora Greene. Uphof (loc. cit.) proposed that Darlingtonia Torr. (1853) be retained over Chrysamphora. Abrams (Illus. Fl. Pacif. States 2: 329, fig. 2171. 1944) likewise continued to use Darlingtonia in hope that it would be conserved over Greene's name.

As a name in accord with the International Rules previous to 1930, when the homonym rule (Art. 60 (3) and 61) was changed, Darlingtonia Torr. (1853) clearly is eligible for conservation. This homonym rule was changed with the definite understanding that all well-known generic homonyms should, if possible, be retained as nomina conservanda (Rehder, A, Weatherby, C. A., Mansfeld, R., and Green, M. L. Conservation of later generic homonyms. Kew Bul. 1935: 341-544. 1935). In the search for later homonyms by these authors, the names were divided alphabetically among different persons, but names beginning with the letters D to K were not checked in time to be submitted in 1935. Thus, Darlingtonia was not considered at the last Congress.

Probably the only objection to this proposal is the small size of the genus. However, names of other small genera, including monotypic ones, have been conserved. An extreme example is Maclura Nutt., proposed over Toxylon Raf. in 1905, even before the proper specific epithet had been transferred to Maclura! Wide usage of the name Darlingtonia should outweigh this objection.

6373. (Sapotaceae.) DIPHOLIS A. DC. in DC., Prodr. 8: 188. 1844. Type sp.: D. salicifolia (L.) A. DC., loc. cit. (Adras salicifolia L., Sp. Pl. Ed. 2, 470. 1762.)

Nomen rejiciendum: Spondogona Raf., Sylva Tellur. 35. 1838. Type sp.: S. nitida Raf., loc. cit.

Dipholis A. DC. is universally accepted for a genus of about 14 species of tropical American trees and shrubs, chiefly in the West Indies but also from Mexico to Panama. The type species, D. salicifolia (L.) A. DC., is widely distributed and reaches the United States in southern Florida. This generic name was adopted by Bentham and Hooker, Engler and Prantl, Index Kewensis, and Dalla Torre and Harms.

Spondogona Raf., listed by Merrill as an earlier name for Dipholis, was similarly cited with its single species in Index Kewensis, though the cross reference under the latter name appeared only in the Addenda et Emendanda (p. 1280). Likewise, Spondogona Raf. was placed as a synonym by Dalla Torre and Harms (Gen. Siphon. Sup. 630. 1907). House (Amer. Midland Nat. 7: 131. 1921) called attention to Rafinesque's prior name and made the combination Spondogona salicifolia (L.) House for the Florida species.

In a monograph of this genus, Arthur Cronquist (Studies in the Sapotaceae, III. Dipholis and Bumelia. Arnold Arboretum Jour. 26: 435-471. 1945) retained Dipholis A. DC. as not requiring conservation and rejected Spondogona Raf. as based upon a monstrosity (Art. 65). Spondogona and its type species S. nitida Raf. are based on Bumelia pentagona Sw. (Nov. Gen. Sp. Pl. Prodr. 50. 1788) with slightly modified description. According to Cronquist the authority for the synonymy is Radlkofer (Ergänz. Monogr. Sapind.-Gatt. Serjania, p. 55-56. 1886), whose disposition of the name had been accepted also by L. Pierre and Ign. Urban (Sapotaceae. Symb. Bot. 5: 138. 1904). Cronquist explained that Swartz described the fruit as 5-angled and that Rafinesque apparently without seeing the type added that the fruit was 5-seeded. Stating that a 5-seeded or even 5-angled fruit in Dipholis would be a monstrosity, Cronquist rejected Rafinesque's earlier name. He reported the number of seeds as 1, or sometimes 2 or 3.

Radlkofer in his reduction of Bumelia pentagona Sw. to synonymy noted that Grisebach (Fl. Brit. West Ind. 401. 1864) had already reached the same decision from the description of that species. Grisebach reported the fruit of this species to be sometimes slightly pentagonal also. In Banks' Herbarium at London, Radlkofer located a specimen collected by Du Ponthieu which he concluded was the basis for Bumelia pentagona, though there was a discrepancy in the locality. No mention was made of a monstrosity. The simplest disposition of this case seems to be definite acceptance of Dipholis A. DC. as a nomen conservandum, even though action possibly may not be required.

8209. (Rubiaceae.) COSMIBUENA Ruiz & Pav., Fl. Peruv. Chil. Descr. 3: 2. 1802. Type sp.: C. obtusifolia Ruiz & Pav., loc. cit. 3: 3. 1802. (C. grandiflora (Ruiz & Pav.) Rusby.)

Non Cosmibuena Ruiz & Pav., Fl. Peruv. Chil. Prodr. 10, pl. 2. 1794. (Rosaceae.) Type sp.: None.

Synonym: Buena Pohl, Pl. Bras. 1: 8. 1827. Type sp.: B. obtusifolia (Ruiz & Pav.) DC., Prodr. 4: 356. 1830. (Cosmibuena obtusifolia Ruiz & Pav., loc. cit.) Non Buena Cav., An. Hist. Nat. 2: 278, pl. 23. 1800. (Rubiaceae.) Type sp.: B. panamensis Cav., loc. cit. p. 279, pl. 23.

Cosmibuena Ruiz & Pav. (1802, not 1794), family Rubiaceae, is a small genus of about 10 species of trees in northern South America and Central America. This genus, a member of the tribe Cinchoneae, came to my attention while I was making field surveys for cinchona bark in Colombia during the late war. Afterwards I noted that the generic name is illegitimate as a later homonym and that no other name is available. However, this name was accepted by Bentham and Hooker, Index Kewensis, Engler and Prantl, and Dalla Torre and Harms and is in universal usage.

Cosmibuena Ruiz & Pav. (1794) was dedicated to Dr. Cosme Bueno, Peruvian geographer, in a work describing new genera but not listing specific names. It was soon suppressed by its authors as a synonym of Hirtella L. and contained no binomials. Cavanilles, noting that this name was a synonym and protesting the compound generic name formed from the two parts of one person's name, honored the same man with another genus, Buena Cav. (An. Hist. Nat. 2: 278, pl. 23. 1800). However, the only species, B. panamensis Cav. (loc. cit. p. 279, pl. 23) promptly was admitted by its author (An. Cienc. Nat. 4: 109-120. 1801) to be congeneric with Gonzalagunia Ruiz & Pav. (Fl. Peruv. Chil. Prodr. 12, pl. 3. 1794), family Rubiaceae, another name rejected by Cavanilles because of its compound derivation from two surnames.

Then, in conformity with the times, Ruiz and Pavon gave the name Cosmibuena Ruiz & Pav. (1802) to a second genus of two species, the genus of Rubiaceae to which the name is now applied. To complicate matters, Pohl (Pl. Bras. 1: 8-10. 1827), citing previous usage of Cosmibuena and Buena, proposed for Cosmibuena Ruiz & Pav. (1802) the shortened name Buena Pohl, because he too considered this compound name unacceptable. Ruiz and Pavon's two species of Cosmibuena were mentioned by Pohl but not transferred to Buena. Instead, Pohl added Buena hexandra Pohl (loc. cit. 1: 10, pl. 88. 1827), which now is placed in the related genus Ladenbergia Klotzsch. However, the type species of Buena Pohl must remain the same as that of Cosmibuena Ruiz & Pav. (1802). The present name for the type species is Cosmibuena grandiflora (Ruiz & Pav.) Rusby (N. Y. Bot. Card. Bul. 4: 368. 1907), based upon Cinchona grandiflora Ruiz & Pav. (Fl. Peruv. Chil. Descr. Icon. 2: 54, pl. 198. 1799).

Of course, under present Rules (Art. 25), formation of Cosbuena from two parts of one man's name is permissible. Buena Pohl is illegitimate both as a later homonym and as a direct substitution for Cosmibuena Ruiz & Pav. (1802). Though reestablished later by H. A. Weddell (Linn. Soc. Jour. 11: 185. 1869) with B. hexandra as the type and for the genus now known as Ladenbergia, Buena Pohl has not been used in recent years. If Cosmibuena Ruiz & Pav. (1802, not 1794), the name in universal use, is not conserved, a new generic name will be required.

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REJECTION OF OBSCURE PLANT NAMES UNACCEPTED WITHIN A CENTURY

Elbert L. Little, Jr.

How to avoid or lessen the replacement of well established plant names through revival of old, abandoned names is a difficult problem of plant nomenclature. Several years ago, an informal note that I favored "amending the rules to disallow priority changes due to later discoveries in obscure books 100 years or more old" was published (W. A. Dayton, Jour. Forestry 41: 373. 1943).

In a discussion of the problem (A proposal to stabilize plant names. PHYTOLOGIA 2: 451-456. 1948), I proposed an addition to the International Rules of Botanical Nomenclature (Ed. 3. 151 p. Jena. 1935; Brittonia 6: 1-120. 1947), as follows:

"Article 63 bis. A name (of a taxonomic group) more than one hundred years old but which has not been accepted as valid, so far as known, by any subsequent author (exclusive of indexes of nomenclature) within the first one hundred years after publication (or by Jan. 1, 1950, in the case of a name published before 1850) must be rejected as a nomen extinctum if it is an earlier synonym or earlier homonym of any name otherwise valid and accepted in use."

This proposal was submitted to the Central Committee on Nomenclature of the American Society of Plant Taxonomists but was not approved by this Committee and was decisively rejected by the July of this Society. An effort has been made to clarify and recast my proposal and to meet the objections raised by this Committee.

Search into the history of codes of nomenclature revealed the following similar old proposal:

"Names of genera or species or varieties which after 100 years since their establishment have not been renewed by other botanists shall be prohibited to be renewed in the future."

It was published in 1893, and its author was none other than Otto Kuntze! This statement, also in French and German, appeared as an amendment to his own code of nomenclature (Kuntze, Otto. Rev. Gen. Pl. 3 (1): ccccxiii. 1893). Even this noted reformer of botanical nomenclature and advocate of strict priority was willing to ignore names which had not been adopted by a second author within a 100-year period! When the International Rules were being prepared in 1905, Kuntze's same proposal was submitted (Briquet, John. Text Synopt. Congr. Internat. Bot. Vienna 34. 1905) but with the following addition

(my translation): "This rule is not retroactive; it goes into force now." Perhaps the addition was intended to exempt the names Kuntze had already revived. Anyway, his proposal received not a single vote of the International Commission in 1905 and did not become a part of the Rules.

Since Kuntze's rule was first proposed, the time interval for names more than 100 years old has doubled and now covers nearly a century, between 1753 and 1849. The need for a similar rule now is correspondingly increased.

The Berlin Rule that no name which had not come into general use within 50 years after publication need be taken up unless accepted by a recent monographer was similar also. It too was not incorporated into the International Rules.

My revised proposal, already submitted to the International Executive Committee for action at the Seventh International Botanical Congress in 1950, follows:

"Art. 63 bis. A name of a taxonomic group must be rejected as not effectively published if it neither has been accepted by a second author nor has been listed in an index of scientific names within the first 100 years after publication (or by Jan. 1, 1950, if published before 1850)."

Besides being simpler and clearer, this proposal differs from my previous one in not applying to names listed in the botanical indexes. Thus, any name in Index Kewensis, whether accepted or not, could not be rejected, even if not adopted by a second author. This limitation would protect the few names of taxonomic groups of small size or restricted geographic distribution which might pass a century known and indexed but dormant because later botanists had had no occasion to refer to them. The unindexed, unused names of Rafinesque would be exempted through listing in E. D. Merrill's Index Rafinesquianus, now in press. Similar, unindexed names of other authors not taken up by a second author within 100 years would be rejected, however. Some old unused varietal names may be affected. The starting date of 1950 is inserted merely to prevent the proposal from being retroactive (Art. 2).

For practical purposes, a name which has escaped indexes for 100 years and furthermore which has not been adopted by any other authors during that period has not been published. Thus, it is proper to disregard this name completely as not having been effectively published in the first place (Art. 36). Whether or not the work was rare or primarily for others than botanists, obviously something was wrong in the original distribution or circulation among botanists. Even in those cases where new names deliberately have been ignored by contemporary authors

because of prejudice or other reasons, later indexes should pick up these names within 100 years if the original publication reached representative botanical institutions (Art. 36).

Art. 63 bis should not be confused with proposals to conserve specific names. The only similarity is that under the latter a specific name discovered to lose priority to an obscure name more than 100 years old could be conserved through special action by an International Botanical Congress. Through restrictions of a century of time, absence of indexing, and lack of acceptance by a second author, Art. 63 bis could apply only to a very limited number of names of any category, while conservation of specific names could become of much broader application. As a general rule not requiring special, individual action on each name, Art. 63 bis is simpler. Instead of increasing the list of conserved names, Art. 63 bis also would eliminate the need for conservation of any additional generic or family names affected by names it rejects.

Of course, a botanist discovering a name more than 100 years old omitted from Index Kewensis and its supplements is not required to make any further search of botanical literature to determine whether the name was used again or indexed elsewhere. This name is automatically rejected under Art. 63 bis. Instead, the burden of proof is upon anyone wanting to revive an obscure old name which he has discovered. Before he could revive the name, he would be obliged to search through botanical publications and also to find the name listed in another index or accepted by a second author.

As an illustration, a taxonomist said that he had discovered an old, overlooked generic name with one specific name. He had hesitated to report the case and have the generic name in use conserved, because this action would result in revival and transfer of the older specific epithet. He wished for a means within the Rules for rejecting this old specific name. Under Art. 63 bis a published note citing the older generic and specific names as synonyms of the names in use and as rejected under Art. 63 bis would suffice. Conservation of the generic name in use would not be necessary. If another author should accept these older names in violation of Art. 63 bis, then this later publication after more than a century would be the date of effective publication (Art. 36). Then, indexes listing these names should indicate that this later date is the date of effective publication.

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A PROPOSAL TO CONSERVE SPECIFIC EPITHETS OF PLANTS

Elbert L. Little, Jr.

From time to time, the established scientific names of plant species of high economic value, as well as other widely known plant species, are found to be technically untenable under the International Rules of Botanical Nomenclature (Ed. 3, 151 p. Jena. 1935; Brittonia 6: 1-120. 1947). Some of these names were correct until changes, always retroactive, were made in the Rules. The old question whether to reject these familiar names in favor of other names almost unknown or whether to amend the Rules to authorize retention of these names as exceptions appears to be gaining increasing numbers of supporters. Following a discussion of the question, a proposed change in Article 21 to authorize nomina specifica conservanda, or conserved specific epithets, is stated. This proposal has been submitted to the Executive Committee.

The recent summary of botanical nomenclature since 1867 by C. A. Weatherby (Amer. Jour. Bot. 36: 5-7. 1949) reviews the history of nomina generica conservanda, which were adopted in the International Rules in 1905 but rejected by followers of the American Code.

Altogether, the number of generic names of seed plants adopted as nomina conservanda from 1905 to 1935 is approximately 793, according to the compilation by W. H. Camp, H. W. Rickett, and C. A. Weatherby (Brittonia 6: 47-93. 1948), in comparison with a total of 9810 genera accepted by C. G. de Dalla Torre and H. Harms (Genera Siphonogamarum. 921 p. Lipsiae. 1900-07) as of about a half century ago. With the latter figure as a basis, about 8.1 percent of the names for genera accepted in that work, or about one name in each twelve, have been retained as nomina conservanda in exception to the principle of priority. The principle of nomina conservanda has been tested over a period of years and has proved to be practicable. Without these nomina conservanda botanical nomenclature would be chaotic and in almost hopeless confusion.

Additional generic names published or revived since Dalla Torre and Harms' compilation generally conform to present Rules and are not eligible for conservation (Art. 21). Also, because of their shorter period of use and generally smaller size, these newer generic names could be rejected, if required, without serious confusion.

It became necessary in 1930 to amend the Rules to provide for nomina conservanda familiarum. Otherwise, a number of universally used family names would have to be rejected. When rules

for names of groups above the rank of family (Rec. VIII, IX) are formulated and these names are carefully checked, it may be desirable to extend this rule to the higher groups also. Thus, as conservation of generic names was authorized in 1905 and conservation of family names in 1930, why not conservation of specific names or, more precisely, specific epithets in 1950?

Conservation of specific names has been advocated by several American taxonomists. The following discussions are illustrations:

Shear, C. L. The failure of the principle of priority to secure uniformity and stability in botanical nomenclature. *Science*, new ser., 60: 254-258. 1924.

Gundersen, Alfred. The need of an enlarged list of botanical nomina conservanda. *Science*, new ser., 64: 182-183. 1926.

Gleason, H. A. A plea for sanity in nomenclature. *Science*, new ser., 71: 458-459. 1930.

Proposals to conserve specific names have been considered at past International Botanical Congresses and rejected each time. It is of interest to note that at the Fifth International Botanical Congress in 1930, three amendments favoring nomina specifica conservanda were submitted by the following: (1) the sub-committee on nomenclature, appointed by the Imperial Botanical Conference, London, 1924, or "British Botanists"; (2) Alfred Rehder; and (3) J. Valckenier Suringar. Three lists of specific names were proposed for conservation, as follows: (1) British Association for the Advancement of Sciences, 4 species of Podocarpus (including 2 new combinations); (2) A. J. Ewart, 43 specific names; and (3) J. Valckenier Suringar, 60 specific names of trees and shrubs. At the Sixth International Botanical Congress in 1935, proposals for nomina specifica conservanda were made by: (1) J. Adams, of Ottawa, Canada; (2) R. Troup, on behalf of various Forestry Institutions and Societies, chiefly of Great Britain (the number of forestry institutions later stated by J. Burt Davy as 38); and (3) three members of the Committee on Australian Botanical Nomenclature, or "Australian Botanists."

Article 21, providing for conservation of generic names, dates in its present form from 1930, but the essential part was adopted in 1905. It is odd but significant that outside of the examples, "generic name" does not appear and "genera" is mentioned but once. This article provides "a list of names" (category not stated) to be retained as exceptions. Except for the word "genera" in the first sentence, the broad statements about "names" and "conserved names" could apply to "a list of names" of any category. Other references to conserved names in the Rules are general. Chapter III, Section 3, includes in its title "conservation of names (Art. 19-22)" without mention of categories. Article 22 authorizes retention of "a name pro-

posed for conservation" (category not specified) when provisionally approved by the Executive Committee but in a footnote provides for nomina conservanda familiarum. This footnote and a note under exceptions to Art. 23 apparently are the bases for conservation of family names, under which a large list of 186 family names (many already correct and not requiring action) was proposed and accepted in 1935. Article 21 itself, without reference to family names, should be amended to mention them.

For definite authorization of nomina specifica conservanda the insertion of the two words "and species" after "genera" in the first sentence of Article 21 would suffice, as in one proposal of 1930, though examples of conserved specific names could be added for clarity. It seems that these general statements, including Art. 22 and the additions to Art. 21 inserted in 1930, were prepared to apply to specific names also, but nomina specifica conservanda were not accepted.

Though the principle of nomina specifica conservanda was rejected in 1935, a compromise motion by J. Ramsbottom was accepted, as follows (T. A. Sprague in Sirks, M. J. Zesde International Botanisch Congress Proc. 1: 343. 1936):

"That an International Committee be appointed to draw up a list of names of economic plants according to the International Rules, and that this list may remain in use for a period of ten years."

This motion in itself is a form of conservation of names which already are in accord with the Rules. Broad authorization to retain a list of names for ten years means stabilization of names and suspension of the Rules. Any new data on the nomenclature of these economic plants would be ignored during this period. However, this list of names of economic plants was never published.

One proposal toward stabilization of plant names was my suggested additional rule to reject old, abandoned names which had not been adopted by a second author within one hundred years after publication (Little, Elbert L., Jr. A proposal to stabilize plant names. PHYTOLOGIA 2: 451-456. 1948). A similar proposal by Otto Kuntze in 1893 received no support from the International Committee in 1905. The old Berlin Rule provided also that no name which had not come into general use within fifty years from its publication need be taken up unless rehabilitated by a recent monographer. My proposal was not approved by the Central Committee on Nomenclature of the American Society of Plant Taxonomists and was decisively rejected by the Jury of the Society. The Committee interpreted this proposal as designed toward infiltrating into the Rules the principle of nomina specifica conservanda and suggested that if this principle is adjudged to be good, the issue should be considered openly.

M. L. Fernald (The confused bases of the name *Pinus palustris*. *Rhodora* 50: 241-249. 1948), interpreting my modest proposal as prohibiting name changes, contributed important notes on past changes of names and on proposals to conserve names of economic plants. He gave the interesting figure that at least 45 percent of the names of vascular plants described in the fifth edition of Gray's Manual (1867) have been changed through restudy of the plants or their nomenclatural types or through changes in the International Rules; 33 percent of the names in the sixth edition (1890) have been changed; and at least 30 percent of the names in the seventh edition (1908) have been changed. After noting some difficulties in previous attempts to conserve names of economic plants, he offered the following significant advice (p. 249): "Those who earnestly wish conservation of really very important names of economic plants should proceed with care, looking out that their would-be conserved names rest upon undoubted types."

In spite of rejections at previous Congresses, the principle of nomina specifica conservanda is becoming more popular and is definitely on the agenda of the next Congress. The International Conference on Botanical Nomenclature and Taxonomy, organized by the International Union of Biological Sciences and held at Utrecht, Netherlands, June 14 to 19, 1948, appointed a Special Committee to deal with questions of nomina specifica conservanda and report to the Stockholm Congress in 1950. Apparently because of my proposal previously mentioned, I was made a member of this Committee.

Seven main objections to the principle of nomina specifica conservanda are stated below, together with arguments against them.

1. "Priority is the fundamental basis of nomenclature."

However, various codes of nomenclature in the past, including the Kew Rule and the Berlin Rule, have made exceptions to priority, as Weatherby noted in his historical summary cited above. The taxonomists of the nineteenth century did not adhere rigidly to priority. Various arbitrary starting dates of nomenclature in different groups of plants, including even the date 1753, have been made in limitation of priority. The principle of nomina generica conservanda and nomina conservanda familiarum has been adopted successfully as an exception to priority.

Though the first 19 of the International Rules are devoted to principles, the principle of priority is not mentioned before Art. 16. Priority is not one of the general considerations and guiding principles (Art. 1-9). First among the essential points in nomenclature (Art. 4) is "to aim at fixity of names," but priority is not listed. Thus, the Rules indicate that stability of names is far more important than priority. Most users of scientific names of plants other than taxonomists surely would agree.

2. "It is easier to change a specific name than to make an exception in the Rules for one name." I formerly accepted this argument, feeling that the Rules were already too complicated. However, names of monotypic genera, such as Maclura Nutt. and Welwitschia Hook. f., have been conserved. Thus, exceptions for single species as well as for other genera of few species have been made successfully in the interest of stability. Also, the Rules provide in appendixes for lists of individual names, specific and other, rejected in special cases as nomina ambigua (Art. 62) and nomina confusa (Art. 64). If scientific names were used only by taxonomists, who are accustomed to lists of synonyms and name changes, perhaps it would be simpler to change a name than to make a special exception in the Rules to retain it. However, the thousands of other persons affected support the view that stability of scientific names of economically important plant species justifies the authorization of individual exceptions to the Rules as needed.

3. "Taxonomists do not want conserved specific names, and the public does not use scientific names, anyway." It is obvious that proposals to conserve specific names have been defeated decisively at past Botanical Congresses. Taxonomists are familiar with lists of synonyms and are accustomed to frequent changes of names and do not need to conserve specific names for themselves alone. The average persons, who seldom, if ever, use scientific names and have never heard of the International Rules obviously are not concerned with the technicalities and inconsistencies of botanical nomenclature. It is significant that a large, intermediate group of workers in applied plant sciences is most interested in conserving specific names of a limited number of economic plants and is most active in proposing the necessary changes in the Rules. These technicians include botanists other than taxonomists, horticulturists, and foresters. These plant scientists to whom the Latin names, being more precise than common names, serve as necessary tools, would benefit most by the stability of conserved specific names. If all the botanists (instead of only taxonomists) attending the next Botanical Congress could vote on this question of nomenclature, nomina specifica conservanda would be approved without difficulty.

4. "The number of nomina specifica conservanda might become very large and cumbersome." It is feared that each botanist might propose his own list of favorite names. Of course, it is difficult to predict how many names might be proposed for conservation and what portion of these would be accepted eventually by Botanical Congresses. Nomina generica conservanda, which have been in successful use since 1905, will illustrate what may be expected. As noted above, they have not been too

numerous nor cumbersome. Though names of some small and relatively unimportant genera were included, the principle of nomina generica conservanda has contributed greatly to stability and prevented countless confusing nomenclatural changes. At present, relatively few additional generic names are being proposed, and these mostly are homonyms affected by a change in the Rules or are in the lower plants, which have not been thoroughly indexed or searched for names needing action. The number of additions soon will become negligible.

Obviously, some restrictions should be placed upon specific names to be conserved, just as are provided for generic names at present under Art. 21. These limitations of Art. 21 to names "which have come into general use in the fifty years following their publication, or which have been used in monographs and important floristic works up to the year 1890" would apply also to specific names. The list should be limited to names of economic species, common species, widely distributed species, or otherwise widely known species, or, in other words, to species of broad interest to persons outside the field of taxonomy.

The present method of handling nomina conservanda proposals (Art. 21, Note 1), through requirement of detailed statements, examination by committees, and final action by infrequent International Congresses, would prevent the list from becoming unduly large or unwieldy. Certain other lists provided by the Rules, such as nomina ambigua, nomina confusa, nomina generica conservanda in special groups of lower plants, the list economic plants authorized in 1935, and Opinions interpreting the Rules, have not even been issued, partly because of insufficient interest, inadequate presentation of proposals, and delayed official action. If interest in conservation of specific names should be no greater, the list will be small indeed.

It is doubtful whether the number of specific names conserved would be much larger than the list of nomina generica conservanda, or more than one or two thousand names. After a few years, relatively few additions would be needed. Also, in time greater uniformity in usage is to be expected for several reasons: the Rules should become more or less stable; names in the older, obscure books will have been accounted for; most questions about typification of the economically important species will have been settled; and the younger workers will learn the correct names.

5. "Some names in use would be changed, and stability of names would not result." As M. L. Fernald (Rhodora 50: 248. 1948) has pointed out, different botanists, especially those of different age groups or generations and those of different countries, might not agree on which name to conserve for a particular species. For some economic species older botanists learned one name and younger botanists another, and for at

at least a few species the botanists in between learned a third name! Also, for other important species two or more specific names are accepted in use, such as an older name formerly correct under the old Rules and a newer name legitimate under a recent change in the Rules but not yet widely adopted. As an illustration, Pseudotsuga douglasii has been proposed for conservation, though Pseudotsuga taxifolia is more widely used.

This objection does not seem serious. Though a few names now in use, at least by some persons, would be changed, the number would be far less than the number of changes required if conserved specific names are not authorized. The specific names to be conserved would be selected by majority votes in a democratic manner and with a spirit of arbitration and compromise. Where there is no clear preference for one name over others, none should be conserved and establishment of the legitimate name left to usage over a period of time.

6. "It would be necessary to look in a special book before using any specific name, to learn if it is conserved." The list of conserved specific names would be published as an appendix to the Rules, probably with the list of conserved generic names (Appendix III). Appendixes of nomina conservanda familiarum (Appendix II), nomina ambigua (Appendix IV), and nomina confusa (Appendix V) are provided by the Rules also. An alphabetical list of all names in the appendixes would be needed. To check a specific name for possible conservation would be no more difficult nor time consuming than checking a generic name at present or looking for a name in one supplement of *Index Kewensis*. The advantages of a list of conserved names with citations and types would outweigh any inconvenience. Besides, an investigator would soon learn the conserved names in his own groups, and the conserved names would be designated as such in various lists of economic plants.

7. "Supporters of the proposal want to prohibit all changes in the scientific names now in use." Those workers in applied plant sciences who have seriously studied nomenclature realize that absolute stability of scientific names is neither attainable nor desirable and that it is impossible to "freeze" the names. They understand that scientific names, like technical terms in their own sciences or words in a language, are subject to change or revision in meaning as a result of additional knowledge and through usage over a period of time. However, they do believe that the changes in names, such as Prof. Fernald's own figure of 30 percent of the names in the last edition of Gray's *Manual* (1908), are excessive and that the taxonomists should do something to stabilize their confused nomenclature. All that these workers are requesting is that they be permitted to retain as exceptions to the Rules only the small number of

familiar, well established names of economic plants which have been discovered to be contrary to the Rules, not 30 percent but only a fraction of 1 percent of the scientific names in use.

As mentioned above, the first essential of nomenclature is "to aim at fixity of names" (Art. 4). The question, then, is: Would a limited list of nomina specifica conservanda contribute to this "fixity of names" or would it not? Obviously, the answer is, Yes!

A very important feature of acceptance of nomina specifica conservanda is the improved relationship between taxonomists and workers in other branches of plant sciences which would follow. This minor concession permitting retention of a relatively small number of names of economic plants would result in greater cooperation between the makers and users of plant names and in greater sympathy and support for taxonomic work. Through the privilege of proposing names for conservation for final decision by an International Botanical Congress, the users of scientific names could participate in a small but effective way towards the elimination of confusion in nomenclature. To authorize retention of a few specific names would really make the Rules stronger and would give the Rules increased support.

The probable alternative to nomina specifica conservanda is not pleasant and is even less desirable. If conserved specific names are not authorized by the next International Botanical Congress, then workers in applied plant sciences in different countries may prepare their own lists of names of economic plants, including a few retained as exceptions to the Rules, to be used for specified periods of time. Lists of this kind have already appeared. For example, B. J. Rendle (Names of timber trees. Ann. Appl. Biol. 32: 184-185. 1945) mentioned the lists prepared by Australian foresters and by British foresters containing standard scientific names of commercial timbers which would be retained whenever the botanical names, in a separate list, were changed by the botanists. Thus, specific names would be conserved in defiance of the Rules.

A. C. Martin (Instability in scientific names of plants. Amer. Midland Nat. 34: 799-800. 1945) has advocated a national nomenclatorial board to issue national check lists of plants of the country including generic and specific names judged by the board to deserve conservation. Also, William A. Dayton (The names of the giant sequoia. Leaflets West. Bot. 3: 209-219. 1943) reported that most of the active plant taxonomists of California, as well as the National Park Service, would continue to retain for the giant sequoia the name Sequoia gigantea (Lindl.) Decne., legitimate until 1930, when it was rejected by a new rule as a later homonym. If the publication of lists

with locally "conserved" names is established in different countries, the practice could not be stopped and the foundation of the International Rules would be seriously affected.

Therefore, I have proposed the changes in Art. 21 listed below. From the best features of the several proposals to be submitted, it is hoped that a practicable proposal on nomina specifica conservanda will be formulated by the Special Committee for action by the Stockholm Congress in 1950.

Art. 21, change first sentence to read (additions underlined and deletion struck out):

"However, to avoid disadvantageous changes in the nomenclature of families, genera, and species by the strict application of the Rules of Nomenclature, and especially of the principle of priority in starting from the dates given in Art. 20, the Rules provide ~~a~~ lists of names of families, genera, and species which must be retained as exceptions (Appendix II for family names and Appendix III for generic and specific names)."

Art. 21, after second sentence insert the following sentence:

"Also, these specific names shall concern only a limited number of species of economic importance and species otherwise widely known."

Art. 21, Note 2, add the following sentence:

"Any proposal of a specific name must cite the type specimen or substitute-type specimen where necessary or desirable and must be accompanied by a photograph of this specimen."

Art. 21, add the following Note:

"Note 5.--In nomina specifica conservanda the specific epithet is conserved against all other specific epithets for the same species, so long as the species concerned is not united or reunited with another species bearing a legitimate name. The binary combination and generic name are not conserved, but the generic name and specific epithet may be conserved independently."

Art. 21, add the following examples (to be formally proposed at the following Congress):

"The specific name Picea excelsa (Lam.) Link (1841; otherwise illegitimate under Art. 60 as nomenclaturally superfluous when published) is conserved against Picea abies (L.) Karst. (1881) and against Pinus abies L. (1753). If Picea were reunited with Pinus, the binary name would be Pinus excelsa Lam. (1778; also nomenclaturally superfluous when published).--Eucalyptus rostrata Schlecht. (1847) is conserved against E.

camaldulensis Dehnh. (1832) and against the earlier homonym E. rostrata Cav. (1797).--Sequoia gigantea (Lindl.) Decne. (1854) is conserved against the earlier homonym Sequoia gigantea Endl. (1847). If the genus Sequoia Endl., nom. conserv., is divided, the binary name for this species becomes Sequoiadendron giganteum (Lindl.) Buchholz (1939)."

Art. 22, delete footnote. (This information has been incorporated into Art. 21, as amended.)

Thus, relatively few changes would be needed to expand Art. 21 for specific names. This proposal differs from previous proposals for nomina specifica conservanda in that the conserved name is associated with a definite type specimen, and that conservation of the specific epithet, not the binary name, is clearly provided. Once the amendment is adopted, the cooperation of an active permanent committee or subcommittee to handle the cases submitted is essential.

Obviously, some provision should be made for associating all conserved specific names with type specimens, such as suggested in this proposal. The type specimen or a substitute-type would be designated when the name is submitted. Thus, any questions about typification of a name or other questions of nomenclature would be settled officially, definitely, and finally when the name is conserved by a Botanical Congress. Thereafter, the conserved specific name is permanently attached to this type specimen (Art. 18). This action would be more effective than otherwise provided in the Rules through Opinions by the International Committee, which heretofore have not been issued (Art. 73 (1)).

Just as the Executive Committee now requests one hundred copies of proposals for modifications of the Rules, it could request several copies of photographs of the type specimen (instead of one) as needed for use by the Committee. A central file of these photographs could be maintained, and extra copies could be distributed to representative botanical institutions. This provision for designation of the type specimen and submission of a photograph would require serious taxonomic study and would discourage long lists of hastily prepared proposals. Perhaps some provision should be made also for designation of the type specimen or substitute-type of a rejected name.

Conservation of specific names is more precisely the conservation of specific epithets and does not involve conservation of binomials or binary combinations. Though not endorsing the proposals, J. Ramsbottom (in Sprague, T. A. Prelim. Opin. Nomencl. Prop. Amsterdam 9. 1935) stated clearly: "Fixity of specific epithet, not specific name, is what is really wanted: to fix specific names (generic names and specific epithet)

would not be in the interests of taxonomy." In a later article, Ramsbottom (Reasons for name-change and the stability of names. Ann. Appl. Biol. 32: 181-183. 1945) emphasized that conservation of specific names would be objectionable but that conservation of specific epithets is a totally different matter.

The present provision (Art. 21, Note 3) for uniting genera having conserved names with other genera is equally applicable to specific epithets. A conserved specific epithet is conserved against all other specific epithets of species including the same type specimen. When a species with a conserved name is united with another species bearing a legitimate name, the oldest legitimate specific epithet is retained (Art. 56). When a species with a conserved name is divided, the conserved specific epithet is retained for the species including the type specimen (Art. 52). The epithet of a rejected specific name could not be used under any generic name for the species including the type specimen of a nomen specificum conservandum.

There would be no advantage in conserving a binary name. To conserve combinations would be impractical, confusing, and unnecessary. Concepts of generic limits are not subject to regulation under Art. 21 nor under any other Rules. With at least a few conserved specific epithets there would be a choice of generic names accepted in use, depending upon the generic limits followed. If a genus containing a conserved specific epithet is divided and if the generic name for this species is changed, the old combination still would be in accord with the Rules and probably would remain in use. The example of Sequoia gigantea (Lindl.) Decne. and Sequoiadendron giganteum (Lindl.) Buchholz illustrates this point. If the generic name of a species with conserved epithet is later discovered to be contrary to the Rules, the generic name can be conserved independently also.

In conclusion, the conserved specific epithet of a plant species of economic importance will become a more or less fixed tool based upon a definite type, like a conserved generic name, and will be subject to change only if the species is divided or united with another species having an older name.

Forest Service,
United States Department of Agriculture,
Washington, D. C.

A NEW SERRATE-LEAVED CHRYSOPHYLLUM FROM BAHIA

Joseph V. Monachino

The species of Sapotaceae have almost always entire leaves. It is therefore understandable that when a young plant of this family with strongly spinose-serrate immense leaves up to four feet in length was introduced into Europe from Brazil it should have defied identification by botanists.

The first living plant of this "mystérieux végétal" in Europe was grown in the conservatory of Legrelle-d'Hanis, at Berchem, Belgium, where it was observed by Linden in 1846. Subsequently (1859, fide Index kewensis) Linden named it Theophrasta imperialis. DeCaisne, also having only sterile material for study, believed it to belong in the Dilleniaceae and applied to it the manuscript name "Curatella speciosa." The genus of this plant was still uncertain in 1874 when an interesting article by Ed. André appeared in L'illustration Horticole; here the species was still referred to as "Theophrasta (?) imperialis", but its place in the Sapotaceae was recognized. Linden had already identified its correct family when he observed among a new shipment of seedlings a few seeds which had failed to germinate, so characteristic are the seeds in the Sapotaceae.

Chrysophyllum imperiale had been cultivated in Europe for thirty years before its genus was determined. An article by J. D. Hooker and a colored illustration of the species under the correct name appeared in Curtis's Botanical Magazine (1885). Hooker reported that a plant 20 feet high flowered in the Botanical Garden of Queens College, Cork, in 1884. By that date the species was in cultivation in various European conservatories, and it is currently treated in Bailey's The Standard Cyclopedia of Horticulture (1935).

In 1891 Pierre erected the genus Martiusella for this species. As distinguishing characters he noted the shorter calyx and corolla tubes, the basal attachment of the filaments and their greater length than in typical Chrysophyllum, the style villose almost to the summit, the longer raphe and thinner cotyledons. He failed to note the peculiar double fold of the filaments near their middle.

The new species described below has a long corolla-tube. The attachment of the filaments and villosity of the style are as noted by Pierre for Martiusella. The novelty was compared with a specimen of Glaziou 8230, Chrysophyllum imperiale, borrowed from the Arnold Arboretum of Harvard University.

CHRYSOPHYLLUM SUBSPINOSUM Monachino, sp. nov.

Arbor C. imperiale valde affinis, sed foliorum laminis minus dentatis subtus densè persistenteque fulvo-pubescentibus et calicibus minoribus valde differt.

Laticiferous trees, buttressed, 30--35 m. tall and 5--6 dm. in diameter, 20--25 m. to the first fork; branches rather stout, with grayish bark, glabrescent, the branchlets minutely grayish

pubescent, sharply ridged; leaf-scars shield-shaped, with 3 bundle-scars. Leaves immense, crowded near the ends of the branches; petioles 1.5--2.5 cm. long, minutely closely tomentose; blades thinly coriaceous, subelliptic to oblanceolate, 13--65 cm. long, 6--22 cm. broad, truncate or obtuse at base, rounded at apex, the margins minutely and irregularly spinose-serrate, the leaf-surface densely brown-tomentose when young, becoming glabrous above, but persistently rusty-pubescent beneath, the hairs crowded, 3- or 2-branched from the summit of an erect stalk, the secondary nerves 13--40 pairs, not greatly ascending (forming angles of 70 to 40 degrees), arcuate near the leaf-margins, somewhat impressed on the upper side of the leaf, the ribs and veins raised on the under side, the tertiary veins prominent, the reticulation open and sharply raised, the venulae forming a prominulous network on the upper side. Inflorescences in dense clusters above the leaf-scars on defoliated branches; pedicels 4--6 mm. long, minutely and closely appressed-tomentose; sepals 5, slightly united at the base, orbicular-ovate, 2--3 mm. long, rounded at the apex, closely appressed-tomentose outside, the outer sepals sparsely pubescent within, the inner sepals glabrous within, membranous and minutely fimbriate on the margins. Corolla well exerted from the calyx, cylindrical when fully expanded; corolla-tube about 2.5 mm. long, very sparsely appressed-pubescent in patches outside; corolla-lobes 5, ovate, 1.5--1.8 mm. long, somewhat acute at apex, glabrous. Complete stamens not seen (? reduced to sharp-pointed staminodes 1--1.3 mm. long); filaments attached near the base of the corolla-tube. Ovary densely hirsute, conical, merging into the style at the apex, 5-celled; ovules axile-basally attached; style very short, about 0.3 mm. long, grooved; stigma obscurely 5-lobulate.

Type: Ricardo de Lemos Fróes 1050, Brazil, Bahia, basin of Rio Pardo, municipality Itambé, savanna, November 19, 1942, deposited in the Krukoff Herbarium at the New York Botanical Garden. "Macaco Jaqueira". The type collection examined consists of two sheets, one of flowering material, the other of a single large leaf; the former is selected as the type.

Additional material examined: R. de L. Fróes 1038, Brazil, Bahia, basin of Rio Catole Grande, municipality Conquista, São Paulinho, November 11, 1942, deposited in the Krukoff Herbarium at the New York Botanical Garden. "Macaco Jaqueira". This sheet contains sterile branches with leaves.

A NOTE ON SCHLEGELIA AND DERMATOCALYX

Joseph V. Monachino

During the course of routine work in the herbarium of the New York Botanical Garden I encountered a collection by Ducke (256; Yale Ser. No. 32632) from São Gabriel filed incorrectly

under Lissoocarpa in the Styracaceae. I identified it from description as Schlegelia albiflora Kuhlmann, and incidentally made the following interesting discovery. Schlegelia Miq. (Bot. Zeit. 2: 785. 1844) and Dermatocalyx Oerst. (Kjoeb. Vidensk. Meddel. 29. 1856) are identical! The following new combination therefore becomes necessary:

SCHLEGELIA PARVIFLORA (Oerst.) Monachino, comb. nov.

Dermatocalyx parviflorus Oerst., in Kjoeb. Vidensk. Meddel. 29. 1856.

It is likely that the following names belong in the synonymy of the above-mentioned species:

Schlegelia cornuta J. D. Smith, in Bot. Gaz. 18: 6. 1893.

Schlegelia costaricensis Standl., in Field Mus. Publ. Bot. 18 (3): 1128. 1938.

Schlegelia ramizii var. macrandra Sandw., in Kew Bull. 1940: 303. 1941.

But to be certain of this it is essential to examine the types, as the descriptions alone are inconclusive. For the generic equivalence there is no doubt; furthermore, the specific epithet of D. parviflorus has precedence over all in Schlegelia except lilacina and elongata, two names generally considered to be synonyms of S. violacea (Aubl.) Griseb. The latter is a member of the section Euschlegelia, whereas S. parviflora belongs in the section Paratanacium.

Of the material distributed as Dermatocalyx parviflorus in the herbarium of the New York Botanical Garden, a specimen from Panama (Almirante, prov. of Bocas del Toro, Proctor Cooper 167) compares with S. fastigiata Schery; the remainder falls into two series -- one, from Costa Rica and Guatemala, with the inflorescences glabrescent, and the other, from British Honduras and Honduras, with the inflorescences densely puberulous. The glabrescent specimens match the Costa Rican (Central Cordillera) Skutch 3324, identified by Sandwith as a somewhat atypical S. ramizii var. macrandra Sandw. These specimens are probably typical S. parviflora, the type of which was also collected in the mountains of Costa Rica. I am induced to draw this conclusion from the localization of Oersted's type as well as from the omission in the original description of any reference to the presence of indumentum ("frutex glaber"). With such rather negative evidence for ascertaining the fine points of varietal differences (specimens with puberulous inflorescences are found in Costa Rica), examination of the type deposited at Copenhagen becomes desirable. Only one specimen (Stevenson 83; Yale Ser. No. 14490) of the British Honduras puberulous material contains adequate corollas. In the flowers examined of this collection the filaments are about 2 mm. long and white-villose mostly toward the base, and the staminodes are likewise villose mostly toward the base; the immature flowers have filaments about 1 mm. long and densely villose for almost their entire length. The plant suggests

Schlegelia parviflora var. trichandra (Sandw.) Monachino, comb. nov.

Schlegelia ramizii var. trichandra Sandw., in Kew Bull. 1940: 304, 1941,

although the indumentum character is not in complete harmony with that originally described for the variety.

Specimens of Schlegelia have been identified as verbenaceous because of their superficial similarities to Citharexylum and Aegiphila. On the other hand, the fact that Dermatocalyx has been placed in the Scrophulariaceae while Schlegelia was put in the Bignoniaceae involves a basic difficulty in classification. Hitherto there has been no suggestion of relationship between the two identical genera. Both were treated separately in Bentham and Hooker's Genera Plantarum (1876), Baillon's Histoire des Plantes (1888, 1891), Engler & Prantl's Die Natürlichen Pflanzenfamilien (1895), as well as in some more recent works, such as the Flora of Costa Rica (Field Mus. Publ. Bot. 18: 1105, 1128, 1938). For the most part this oversight has been due to inadequate material, as the genus is strikingly characteristic and should have commanded attention by its anomaly in either the Bignoniaceae or the Scrophulariaceae. In Martius' Flora Brasiliensis (1897) Schlegelia is placed together with Crescentia in the tribe Crescentieae. Assuredly the two genera are easily separated by the differences presented in the Flora. The key difference of bilocular versus unilocular ovary is deeply significant, but the seed morphology of Schlegelia is not given the attention deserved.

The flowers of Schlegelia can be admitted in both the Bignoniaceae and the Scrophulariaceae. The seeds more strongly suggest Scrophulariaceae. They are numerous, axile, somewhat quadrangular or trigonous with 4 or 3 very faint margins, about 2 mm. long and 1 mm. wide, and have a minutely reticulate surface. The embryo is erect, almost the size of the seed, and is covered by a substantial fleshy coat (albumen). The cotyledons are oval to suborbicular, thickish, the caulicle is about 0.7 mm. long. The seed and embryo are oversized for Scrophulariaceae, but more nearly conform to the latter than to Crescentia or Bignoniaceae in general.

The importance of seed character as a deciding factor between these two families has been discussed by D. H. Campbell (The relationships of Paulownia, Bull. Torr. Bot. Club 57: 47--50, 1930). The subject of relationships in borderline genera is provocative in general, and Schlegelia particularly deserves further investigation.

The genus Dermatocalyx, and thus by implication its position in the Scrophulariaceae, was accepted by J. D. Smith in 1899; also by H. N. Moldenke who in 1934 referred to D. parviflorus a plant misidentified as Aegiphila, and who in 1946 described a new Ecuadorian species in the genus. Dermatocalyx is treated in the Scrophulariaceae by Record & Hess in Timbers of the New World (1943).

One of the latest and most competent students of the Bignon-

THE NEW "FLORA MALESIANA"

Harold N. Moldenke

The region of the earth's surface commonly called the Malaysian Archipelago is a vast area which if superposed upon Europe and Asia would extend from the Arctic Circle to western Ireland, through Russia, to Turkestan and well into Pakistan;

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Harold N. Moldenke

Printed
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This work is being published under the auspices of the Botanic Gardens at Buitenzorg, under the editorship of C. G. G. J. van Steenis, but with the cooperation of many botanical institutions elsewhere and the collaboration of many recognized specialists. The work is planned to embrace three volumes on the algae, three on the fungi and lichens, five on mosses and liverworts, three on ferns and fern-allies, and fifteen on the flowering plants. Besides these 29 volumes of monographs of all the families of plants known from the area, there will be a volume on the floristic and historic plant geography, one on Malaysian vegetation types, and a third which will be a cyclopedia of Malaysian plant collectors, with short biographies and itineraries of over 3000 collectors.

Volume 4, part 1, was published in December, 1948, and includes monographs of the Aceraceae (by S. Bloembergen), Phylodracaceae (by C. Skottsberg), Amistocladaceae, Aponogetonaceae, and Actinidiaceae (all by Van Steenis), Burmanniaceae (by E. P.

iaceae, N. Y. Sandwith, admits Schlegelia in the tribe Crescentieae of the Bigoniaceae, although he notes that it is certainly unlike its congeners. F. W. Pennell, the world's outstanding authority on the Scrophulariaceae, apparently rejected Schlegelia from his pet family. This is gathered from annotation data on a specimen of Schlegelia from Colombia (Killip & Smith 15357). Flowers were dissected by A. C. Smith who referred the plant together with a query to Dr. Pennell: "Is this a Scroph?", to which Pennell replied "No. Why not Bigoniaceae?" May not the reader, to whom literature in this instance seems to offer no help, wonder "And why not Scrophulariaceae?"

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Jonker), Sphenocleaceae (by H. K. Airy-Shaw), Nyssaceae (by J. Wasscher), Sarcospermaceae (by H. J. Lam), and Stackhousiaceae (by F. I. Brouwer). Included also is an introduction giving a résumé of the history of botanical work in the area, an explanation of the plans for the present work, and 22 extremely valuable pages on general considerations with a classification, description, and illustrations of phenotypic and genotypic variations which must be understood by all workers on a flora such as this.

It is expected that the work, profusely illustrated by maps, photographs, and line-drawings, will be completed in 25 years. Sample copies may be obtained from and subscriptions placed with Chronica Botanica Company, P. O. Box 151, Waltham 54, Massachusetts.

NOTES ON NEW AND NOTEWORTHY PLANTS. VIII

Harold N. Moldenke

ACANTHOLIPPIA RIOJANA Hieron. & Moldenke, sp. nov.

Frutex; caulis ramisque multis duris albis longitudinaliter multistriatis suberosis glabris vel glabrescentibus; samentis numerosis brevibus rigidis divaricatis spinosis dense puberulis; internodiis valde abbreviatis; foliis plerumque oppositis saepe irregulariter dispositis valde reductis lepidosis carnosiss sessilibus arote adnatis plerumque 3-lobatis.

Much-branched xerophilous shrub; stems and branches tough, white, longitudinally many-ridged, glabrous or glabrescent, covered with corky bark; twigs numerous, short, stiff, divaricate, spine-tipped, densely puberulent; principal internodes much abbreviated, the twigs usually 5--15 mm. apart, but leaves borne more or less irregularly on the branches between the twigs, the leaves on the twigs mostly adjacent or practically so; leaves mostly opposite, but sometimes alternate or scattered, much reduced and scale-like, fleshy, sessile and closely adnate to the twigs, branchlets, branches, and even scattered on the main stems, 1--2 mm. long, mostly 3-lobed, the central lobe about twice as long as the two lateral lobes, with much thickened and more or less revolute margins, deeply 3-annulate beneath, the margins glabrous, but the thin line of blade visible within the channels mostly minutely puberulent, no expanded non-appressed leaves produced even during and after anthesis; spikes terminal, much abbreviated, dense and congested, less than 1 cm. long and wide, few-flowered; bractlets rather large, imbricate, broadly elliptic, 3--3.5 mm. long, 1.5--2 mm. wide, somewhat navicular, short-acuminate at the apex, carinate on the back, densely white-villous on the back, subequaling the calyx; calyx tubular, about 3.5 mm. long, not winged, densely villous; rachis densely villosulous.

The type of this very remarkable and distinct species was collected by G. Hieronymus and G. Niederlein at Vinchina, La Rioja, Argentina, on March 5, 1879, and is deposited in the herbarium of the Botanisches Museum at Berlin. The name Acantholippia riojana was proposed for the species by Hieronymus, but was never published as far as I have been able to ascertain.

AEGIPHILA FROESI Moldenke, sp. nov.

Frutex; ramis gracilibus obtusissime tetragonis densissime longaeque hirsutis, pilis rigidis ochraceis vel fulvis multicellularibus divergentibus; foliis oppositis; petiolis crassiusculis dense longeque hirsutis; laminis chartaceis ovatis, ad apicem breviter acuminatis, ad basin cordatis, integris vel longe ciliatis, utrinque longe ochraceo-villosis; inflorescentiis terminalibus sessilibus vel subsessilibus cymosis bracteolatis.

Shrub; branches slender, very obtusely tetragonal, very densely long-hirsute with stiff ochraceous or fulvous multicellular hairs 4--6 mm. long standing at right angles to the branch; principal internodes 4.5--8 cm. long; leaves decussate-opposite; petioles rather stout, 5--8 mm. long, densely long-hirsute like the branches; blades chartaceous, rather uniformly light-green on both surfaces, ovate, 9--13 cm. long, 5--8 cm. wide, short-acuminate at the apex, cordate at the base, entire-margined but long-ciliate due to the projection of the long-villous, ochraceous or fulvous hairs which lightly cover both surfaces of the blade; midrib slender, sharply prominent above, rounded-prominent beneath and more densely villous; secondaries slender, 7--10 per side, arcuate-ascending, plane or slightly prominulous above, prominent beneath, arcuately joined in many loops near the margins; tertiaries and veinlet reticulation conspicuous on both surfaces, slightly prominulous beneath; inflorescence terminal, sessile or subsessile, cymose, about 2 cm. long and 2 cm. wide, very densely fulvous-hirsute when immature, very abundantly and conspicuously bracteolate during anthesis; bractlets linear, 1.5--2 cm. long, abundantly long-hirsute, the lowermost ones often expanded and foliaceous toward the apex; pedicels filiform, 1.5--2 mm. long, glabrous; calyx cuculiform, about 1 mm. long and 1.5 mm. wide, completely glabrous, its rim truncate and subentire; corolla hypocrateriform, its tube cylindrical, about 3 mm. long, glabrous, its lobes 2--4 mm. long, glabrous.

The type of this beautiful and very distinct species was collected by Ricardo de Lemos Fróes (no. 20917) -- in whose honor it is named -- on terra firma at Benjamin Constant, Amazonas, Brazil, on May 9, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is closely related to A. villosissima Moldenke and A. conlata Poepp., but may be distinguished at once by its more conspicuous bractlets and entirely glabrous truncate calyx.

ALOYSIA CASADENSIS Hassler & Moldenke, sp. nov.

Frutex; ramis gracilibus obtuse tetragonis virgatis densiuscule patentique pubescentibus; nodis non annulatis; foliis oppo-

ositis; petiolis gracillimis abbreviatis vel obsoletis dense patentem pubescentibus; laminis chartaceis late ellipticis, utrinque viridis argute acutis, ad basin cuneatis, crasse serrato-dentatis, supra dense breviterque pubescentibus (pilis bulbosis), subtus dense breviterque pubescentibus et resinoso-glandulosis; inflorescentiis axillaribus spicatis.

Shrub, 1--1.2 m. tall; branches slender, obtusely tetragonal, virgate, rather densely spreading-pubescent; nodes not annulate; principal internodes 2--3 cm. long; leaves decussate-opposite; petioles very slender, 1--2 mm. long or obsolete, densely spreading-pubescent; blades chartaceous, broadly elliptic, uniformly green on both surfaces or slightly lighter beneath, 1--3 cm. long, 4--14 mm. wide, sharply acute at the apex, cuneate at the base, coarsely serrate-dentate with 2 or 3 teeth on each margin, densely short-pubescent with bulbous-based hairs above, densely short-pubescent and resinous-glandular beneath; midrib very slender, plane or subimpressed above, prominulous beneath; secondaries very slender, 3 or 4 per side, mostly obscure or indiscernible above, subprominulous beneath, ascending, only slightly arcuate; veinlet reticulation indiscernible on both surfaces; inflorescence axillary, spicate, to 3.5 cm. long (or longer?); peduncles very slender, 10--13 mm. long, tetragonal, spreading-pubescent with incanous hairs; spikes densely many-flowered; rachis densely short-pubescent, incanous; bractlets lanceolate, 1.5--2 mm. long, attenuate-acuminate, densely spreading-pubescent and resinous; calyx very densely spreading-pubescent, incanous, about 2 mm. long, its rim deeply 4-toothed, the teeth narrow and divergent; corolla white, about 3 mm. long, puberulent outside.

The type of this distinctive species was collected by Teodoro Rojas (no. 2529) at the edge of "montes", Puerto Casado, Chaco, Paraguay, in February 1917, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo. It was named "Lippia lingustrina var. casadensis" by Hassler.

ALOYSIA LYCIOIDES var. REVOLUTA Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum rigidis ellipticis usque ad late ellipticis vel ovatis saepe subdentatis distincte revolutis recedit.

This variety differs from the typical form of the species in having the leaf-blades of very firm texture, elliptic to broadly elliptic or ovate, often subdentate, with distinctly revolute margins.

The type was probably collected by José Arechavaleta somewhere in Uruguay and is deposited in the herbarium of the Museo de Historia Natural at Montevideo.

ALOYSIA OBLANCEOLATA Moldenke, sp. nov.

Frutex; ramis graciusculis obtuse tetragonis griseis adpresso-puberulis plerumque 4-costatis; ramulis gracilibus acute tetragonis sordido-griseis dense adpresso-puberulis et resinoso-granulosis; nodis valde annulatis; foliis oppositis saepe pseudo-fascioulatis; laminis firme chartaceis oblanceolatis, ad

apicem rotundatis et subapiculatis, ad basin longe cuneatis, supra pustulatis, subtus glabris vel subfarinosis, integris valde revolutis; inflorescentiis axillaribus spicatis dense multifloris.

Shrub, 2--3 m. tall; branches rather slender, obscurely tetragonal, gray, appressed-puberulent, usually rather plainly 4-costate, the ribs eventually separating as string-like strips; branchlets slender, acutely tetragonal, sordid-gray, densely appressed-puberulent and resinous-granular; nodes plainly annulate; principal internodes quite uniform, 0.8--2 cm. long; leaves decussate-opposite, but usually with greatly abbreviated twigs in their axils, giving the appearance of opposite fascicles of leaves, sessile or subsessile; blades firmly chartaceous, rather dark-green above, light-green beneath, oblanceolate, 1--1.5 cm. long, 2.5--6 mm. wide, rounded and subapiculate at the apex, long-cuneate at the base, pustulate above, glabrous or subfarinose beneath and resinous-granular, entire, with decidedly revolute margins; midrib slender, impressed above, very sharply prominent beneath; secondaries very slender and irregular, 3--6 per side, indiscernible above, subprominulous beneath; veinlet reticulation indiscernible above, obscure beneath; inflorescence axillary, spicate, to 4 cm. long, densely many-flowered; peduncles very slender, short, 5--8 mm. long, densely puberulent and resinous, tetragonal, sulcate; rachis densely short-pubescent; bractlets lanceolate, 1 mm. long or less, acute, puberulent; calyx 2.5--3 mm. long, very densely white-villous with spreading or reflexed hairs, the rim shortly 4-toothed, the teeth narrow and divergent; corolla-tube about 4 mm. long, glabrous outside, the limb 2 mm. wide, puberulent in the throat within, glabrous outside.

The type of this characteristic species was collected from cultivated material at San Bernardino, Paraguay, by Teodoro Rojas (no. 53a), in July 1915, and is no. 7324 in the Osten Herbarium at the Museo de Historia Natural at Montevideo. It was determined as "Lippia ligustrina var. paraguariensis Briq." by Hassler.

CALLICARPA TSIANGII Moldenke, sp. nov.

Frutex; ramis mediocriter gracilibus obtusissime tetragonis stellato-farinaceis; foliis oppositis; petiolis gracilibus abbreviatis stellato-farinaceis; laminis tenuiter membranaceis late ellipticis vel obovatis longe acuminatis, ad basin acuminatis, denticulatis, supra puberulis, subtus dense puberulis et stellatis; inflorescentiis axillaribus cymosis multifloris brachiatis ubique dense stellatis.

Shrub 4 m. tall; branches medium-slender, very obtusely tetragonal, stellate-farinaceous with sordid-whitish pubescence that soon rubs off; principal internodes about 15 cm. long; leaves decussate-opposite; petioles slender, abbreviated, 2--5 mm. long, stellate-farinaceous; blades thin-membranous, somewhat lighter beneath, broadly elliptic or obovate, about 25 cm. long and 10--10.5 cm. wide when mature, long-acuminate at the apex, acuminate at the base, denticulate-margined from the widest

part to about half way up to the terminal acumination, minutely puberulent above, more densely so beneath and stellate on the larger venation; midrib slender, plane above, prominent beneath; secondaries very slender, 8--10 or more per side, arcuate-ascending, not distinctly joined at the margins; tertiaries and veinlet reticulation obscure above, the larger parts subprominulous beneath; inflorescence axillary, cymose, 4--5.5 cm. long, 4.5--6 cm. wide, many-flowered, brachiate, densely stellate throughout; peduncles slender, 8--20 mm. long; foliaceous bracts absent; bractlets and prophylla linear, 1--3 mm. long, stellate-farinaceous; pedicels filiform, 1 mm. long or less, stellate-farinaceous; calyx campanulate, 1 mm. long and wide (or less), more or less stellate-farinaceous, minutely 4-apiculate; corolla infundibular, about 4 mm. long in all, the lobes very short, glabrous outside except for some stellate hairs near the apex.

The type of this species was collected by Y. Tsiang (no. 10081) -- in whose honor it is named -- in dense shade of mixed woods, alt. 700 m., Tunghuashan, Inhwang, Kiangsi, China, on June 30, 1932, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM WILDII Moldenke, sp. nov.

Fruticulus vel frutex vel arbor parva; ramis crassiusculis rigidis obtuse tetragonis suberosis, in siccitate longitudinaliter corrugatis; nodis annulatis; internodiis plerumque valde abbreviatis; foliis oppositis; petiolis indistinctis vel obsolete marginatis vel alatis; laminis chartaceis ellipticis saepe falcatis conduplicatisque, ad apicem acutis vel subacuminatis, ad basin longe attenuatis, utrinque glabris nitidisque; inflorescentiis terminalibus racemosis sessilibus vel subsessilibus saepe densiuscule multifloris ubique pilosis vel puberulis.

Bush, shrub, or small tree, 2--3 m. tall; wood soft; branches rather stout, stiff, obtusely tetragonal, pithy, the bark smooth, gray-brown, corky, becoming longitudinally wrinkled or corrugated in drying; nodes annulate; principal internodes 0.5--8 cm. long, mostly much abbreviated on the branchlets and twigs; leaf-scars large, broadly cordate-elliptic, concave, corky-margined; leaves decussate-opposite, not present during anthesis or when fruit is produced; petioles rather indistinct, 2--10 mm. long or obsolete, winged or at least margined and glabrous; blades palish-green above, slightly paler beneath, not at all aromatic, chartaceous, elliptic, 3--9 cm. long, 1.5--5.5 cm. wide, often more or less falcate and conduplicate, mostly acute or very slightly acuminate at the apex (the point itself rather blunt), long-attenuate into the petiole at the base, glabrous and shiny on both surfaces, the margins rather coarsely serrate from the middle or slightly below the middle to near the apex, the apex and base entire, the teeth broadly triangular, irregular, blunt; midrib rather stout, mostly plane above, prominent beneath; secondaries very slender, 5--7 per side, arcuate-ascending, rather short, plane above, very slightly prominulous beneath, anastomosing in many

loops near the margins; tertiaries very slender, rather conspicuous on both surfaces but not prominent; inflorescence terminal, racemose, appearing when the plants are totally leafless and apparently maturing their fruit while the plants are still leafless; racemes sessile or subsessile, 4.5--10 cm. long, 2.5--4.5 cm. wide, many-flowered, often rather dense, the rachis slender, rather densely tomentellous-pubescent toward the base, less densely so toward the apex and after anthesis or sometimes very densely tomentellous throughout even when the fruits are falling, the hairs sordid-gray or brownish, the internodes abbreviated, usually only 7--15 mm. long, the flowers borne in opposite pairs at the nodes, each subtended by a conspicuous, lanceolate-ovate, often attenuate-acuminate bractlet usually 3--6 mm. long and 1.5--2 mm. wide at the base, sometimes the lowest ones elongated to 15 mm. and slightly foliaceous; pedicels filiform, 5--8 mm. long or more abbreviated during anthesis, more or less densely pubescent; calyx campanulate, firm-textured, reddish when fresh, 4--10 mm. long and about equally wide, more or less pilose-puberulent, especially along the rim, 5-lobed, the lobes 2--4 mm. long, subacute; corolla-tube about 6 mm. long, glabrous outside, the limb deeply 5-parted, the anterior lobe mauve or blue, obovate-elliptic, about 15 mm. long and 7 mm. wide, densely puberulent on the outer surface, the other lobes similar but pale-green, the outer side of all of the lobes dark gray-green; stamens 4, long-exserted; filaments about 3 cm. long, spreading-pilose near the base, downwardly curvate; anthers oblong, about 6 mm. long, yellowish; pistil long-exserted, 2--4 cm. long, usually slightly exceeding the stamens, often downwardly curvate, glabrous; stigma shortly bilobed, the lobes acute; ovary subglobose, about 5 mm. long and wide, glabrous, 4-celled, 4-ovulate; fruiting-calyx incrassate, broadly campanulate, rather finely pilosulous, the spreading lobes usually about as long as the tube; fruit fleshy, green, turning black, 1--1.5 cm. long and wide, deeply 4-lobed, glabrous, usually 4-seeded.

The type of this interesting species was collected by H. Wild (no. 1321) in woodland in Mfuti, alt. 4000 feet, Miami District, Southern Rhodesia, on October 4, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden. The type collection is no. 15489 in the Government Herbarium at Salisbury. Other flowering collections include Eyles 5056, H. Wild 1255 [Govt. Herb. Salisbury 15406], and J. C. Hopkins s.n. [Govt. Herb. Salisbury 12797] from Southern Rhodesia, Mrs. Macaulay 879 and F. A. Rogers 8514 from Northern Rhodesia, and J. McCounie 167 from Nyasaland. The description of the fruit is taken from E. Milne-Redhead 1236 and C. Sandwith 45 from Northern Rhodesia. Foliage characters are taken from H. Wild 2846 [Govt. Herb. Salisbury 22823]. The species is named in honor of the distinguished collector of the type specimen, whose splendid and very friendly cooperation in the writer's studies of the Rhodesian members of this and other groups is most deeply appreciated, and who made a special trip to the Ruwa River to col-

lect the first foliage material known of this species. He reports that the species does not grow in colonies, but occurs scattered. He found it at the edge of a granite whaleback with Combretum gueinzii, Vitex paysonii, Pterocarpus angolensis, and stunted Isoberberlinia globiflora and Brachystegia spiciformis. Photographs of the living plant are deposited, through his generosity, in the Britton Herbarium, and a painting of the plant, its leaves, flowers, and fruit is deposited in the Government Herbarium at Salisbury.

JUNELLIA PUNCTULATA Hieron. & Moldenke, sp. nov.

Fruticulus nanus caespitosus; caulibus ramisque valde abbreviatis densiuscule patenteque pubescentibus dense resinoso-granularibus; internodiis valde abbreviatis; foliis oppositis sessilibus profunde trifidis, lobis linearibus utrinque dense patenteque pubescentibus et resinoso-granularibus, ad apicem obtusis.

Low caespitose perennial, woody at the base, apparently no more than 7 cm. tall; stems and branches greatly abbreviated, rather densely spreading-pubescent with whitish hairs, densely resinous-granular; internodes abbreviated to 2 mm. or less; leaves decussate-opposite, sessile, deeply 3-fid, the divisions linear, 2--4 mm. long, densely spreading-pubescent and resinous-granular on both surfaces, obtuse at the apex.

The type of this species was collected by G. Hieronymus and G. Niederlein (no. 686) at Cuesta del Tocino, Sierra Famatina, La Rioja, Argentina, and is deposited in the Osten Herbarium (no. 13027) at the Museo de Historia Natural at Montevideo. Unfortunately, the type collection does not have inflorescences sufficiently matured for description, but the general habit, foliar, and pubescence characters are sufficient to identify the species.

LANTANA ARISTATA var. **HOEHNEI** Moldenke, var. nov.

Haec varietas a forma typica speciei bracteolis rotundato-obtusis at brevissime apiculatis recedit.

This variety differs from the typical form of the species in having the bractlets rounded-obtuse and very short-apiculate instead of long-acuminate at the apex.

The type was collected by Frederico Carlos Hoehne (Comm. Rondon 2821, in part) at Coxipó da Ponte, Mattogrosso, Brazil, in March 1911, and is deposited in the Britton Herbarium at the New York Botanical Garden. A duplicate of the same collection number, deposited at the Instituto de Botanica at São Paulo, is typical variety angustifolia (Kuntze) Moldenke. The two varieties are very easily distinguished by the bractlets, and even the foliar characters are distinctive. The new variety is named in honor of the distinguished collector of the type plant and in commemoration of the tremendously valuable work which he has done in the botanical exploration and elucidation of Brazil and in the establishment of the famous Instituto de Botanica and Jardim Botânico, with its arboretum and experimental forest adjuncs, at and near São Paulo.

LANTANA TRIFOLIA f. HIRSUTA Moldenke, f. nov.

Hæc forma a forma typica speciei ramis ramulisque petiolisque pedunculisque dense hirsuto-pubescentibus reedit.

This form differs from the typical form of the species in having its branches, branchlets, petioles, and peduncles densely hirsute-pubescent. Its inflorescences and leaf-blades are also usually more densely pubescent than in the typical form.

The type was collected by José Cuatrecasas (no. 14438) along the margins of roads and in cultivated places between Cabuyal and La Solorza, alt. 1000 m., Valle del Cauca, Colombia, on May 27, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden.

MESANTHEMUM AFRICANUM Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis firme chartaceis graminoidibus, in statu juventutis utrinque longe pilosis, in statu senectutis glabrescentibus, multivenosis non fenestratis, ad apicem obtuse cucullatis; pedunculis solitariis multistriatis paulo contortis stramineis glabris; vagina arcte adpressa plusminusve longe pilosis multistriatis paulo contortis oblique fissis, lamina erecta cucullata; capitulis solitariis globosis albis.

Acaulescent herb; leaves basal, tufted, firmly chartaceous, grass-like, bright-green, 15--17 cm. long, about 1 cm. wide at the midpoint, long-pilose on both surfaces when young, glabrescent in age, bluntly cucullate at the apex, many-veined, not fenestrated; peduncles solitary, 60--63 cm. long, many-ribbed, somewhat twisted, stramineous, glabrous; sheath rather closely appressed, about 21 cm. long, more or less long-pilose with scattered hairs, many-striate, somewhat twisted, obliquely split at the apex; the blade erect, 5--6 cm. long, cucullate at the apex; heads solitary, globose, white, 1--1.3 cm. in diameter; involucre bractlets few, mostly hidden, stramineous, barbellate at the apex; receptacular bractlets narrow-spatulate, about 3.5 mm. long, the blade 0.5 mm. wide and densely white-barbellate, the haft glabrous and 0.2 mm. wide, its base surrounded by many dark-brown hairs about 4 mm. long and completely hiding the bractlet; staminate florets: sepals 3, connate only at the base, very dark-brown, about 2.5 mm. long and 1 mm. wide, rounded or subtruncate at the apex and densely white-barbellate on the back there, otherwise glabrous; petals 3, connate, white or subhyaline, about 3.5 mm. long, glabrous except for the densely white-barbellate apex; stamens 6, epipetalous, inserted near the base of the corolla-tube, included; pistillate florets: sepals 3, free and separate, caducous, dark-brown, oblong, navicular, about 2.7 mm. long and 1 mm. wide, obtuse or rounded at the apex and densely white-barbellate on the back there; petals 3, free at the base, connate into a tube above, white or subhyaline, about 4 mm. long, densely villous with long, dark-brown, appressed hairs reaching from the base to the middle on the outside, also shortly brown-villous within just above the free portion, the lobes about 0.8 mm. long, obtuse, densely white-villous at the apex on the back; staminodes

3, anantherous, epipetalous, slightly surpassing the inner hairs on the corolla-tube; pistil about 3.5 mm. long, glabrous; style about 1 mm. long; stigmas 3, erect, about 1 mm. long; ovary large, 3-celled, 3-sulcate, 3-ovulate

The type of this species was collected by K. C. Munch (no. 72) in the Chimanimani mountains, Portuguese East Africa, just over the Southern Rhodesian boundary, on June 9, 1948, and is deposited in the Britton herbarium at the New York Botanical Garden. The species was also collected by F. W. J. McGosh on the Southern Rhodesian side of the boundary.

PAEPALANTHUS BARKLEYI Moldenke, sp. nov.

Herba humilis caulescens; ramis valde foliosis rectis vel adscendentibus; foliis linearibus dense imbricatis amplexicaulibus, in statu juventute supra longe pilosis, in statu senectutis utrinque glabratis, ad apicem subulato-acutis, indistincte 5-nerviis non fenestratis; pedunculis contortis glabris striatis; vaginis cylindricis laxis multistriatis parce pilosis contortis oblique fissis; capitulis subglobosis griseo-albidis.

Low herb, 15--18 cm. tall; stems evident, to 10 cm. long, 3-branched; branches very leafy, about 5 cm. long, erect or ascending; leaves linear, densely overlapping, 2--2.5 cm. long, 1.5--2 mm. wide at the midpoint, sheathing the stem at the base, practically glabrous throughout when mature, long-pilose above when young, subulate-acute at the apex, rather indistinctly 5-nerved, not fenestrate; peduncles 3--6 per branch, about 13 cm. long, several-ribbed, twisted, glabrous; sheaths cylindrical, rather loose, about 2 cm. long, many-striate, twisted, sparsely pilose and obliquely split at the apex; heads subglobose, grayish-white, sordid, 5--6 mm. in diameter; involucrel bractlets stramineous, concave, ovate, about 2.5 mm. long and 1.5 mm. wide, acute at the apex, minutely strigillose toward the apex on the back; receptacular bractlets oblong or subobovate, dark-brown, about 1.5 mm. long and 0.5 mm. wide, densely white-barbellate at the apex on the back; staminate florets: sepals 3, dark-brown, obovate, about 1.5 mm. long and 1 mm. wide, navicular, densely white-barbellate at the rounded apex; petals 3, united into a hyaline tube about 1.3 mm. long, glabrous; stamens 3; filaments about 0.8 mm. long, hyaline, glabrous; rudimentary pistil minute; pistillate florets: sepals 3, dark-brown, more or less navicular, broadly obovate, about 1.5 mm. long and 1 mm. wide, densely white-barbellate at the apex on the back; petals 3, free and separate to the base, oblong or oblanceolate, subhyaline, about 2 mm. long and 0.8 mm. wide, strigillose-barbellate on the back; pistil 2 mm. long, glabrous; stigmas 3; style-appendages 3, slightly narrower and longer than the stigmas; ovary 3-celled, 3-lobed, 3-ovulate, glabrous.

The type of this species was collected by Samuel Posada S., Manuel Torregrosa, and Fred A. Barkley (no. 18A100) in sandy rather dry soil among ferns, rushes, and some shrubs along streams on the subparamo, in a cold climate, at an altitude of about 2600 m., about 1 km. north of Santa Rosa de Osos, Antioquia, Colombia, on September 25, 1948, and is deposited in the

Britton Herbarium at the New York Botanical Garden.

PAEPALANTHUS LILLIPUTIANUS Moldenke, sp. nov.

Herba nanissima; caulibus erectis dense foliatis; foliis firmis viridibus recurvatis lanceolatis subamplexicaulibus obtusis, basin versus parce ciliatis, cetera glabra; capitulis sessilibus densissime albo-villosis plerumque 3; vaginis pedunculisque bracteolisque involucrentibus nullis; receptaculo densissime longeque villosa.

Extremely dwarf herb, about 80 mm. tall in all; stems about 50 mm. long, erect, densely leafy, usually several-headed, each head terminating an abbreviated branch; leaves firm-textured, uniformly bright-green on both surfaces, recurved, lanceolate, about 4 mm. long, ampliate and whitened at the more or less clasping-appressed base, 1.5 mm. wide at the base, about 0.8 mm. wide at the midpoint, blunt at the apex, sparsely ciliate along the margin toward the base (just above the basal ampliation), otherwise glabrous, the uppermost subtending the heads and about 3 mm. long; heads sessile, about 2 mm. wide, very densely white-villous, usually about 3 per plant; sheaths, peduncles, and involucreal bractlets absent; receptacle very densely long-villous with erect white hairs; receptacular bractlets linear, hyaline, about 1 mm. long, densely long-villous in brush-like fashion at the apex; staminate florets: sepals 3, connate at the base only, linear-oblong, about 1.3 mm. long and 0.2 mm. wide, rounded at the apex, long-villous on the back and densely white-barbellate at the apex; petals 3, connate into an infundibular hyaline tube about 1 mm. long, glabrous; stamens epipetalous, 3; pistillate florets: sepals 3, free and separate to the base, hyaline, oblong-linear, about 1 mm. long and 0.2 mm. wide, acute at the apex, glabrous; petals 3, free and separate, hyaline, oblong-linear, about 1 mm. long and 0.2 mm. wide, loosely barbellate at the apex, otherwise glabrous; pistil about 1.3 mm. long, glabrous; style about 0.4 mm. long; stigmas 3, erect, about 0.4 mm. long; ovary 3-lobed, 3-ovuled, glabrous.

The type of this tiny species was collected by R. Giglioli in British Guiana in 1931 and is deposited in the herbarium of the Instituto Botanico della Università at Florence, Italy. Nothing further is known of the exact place of collection, although other collections made by the same Italian expedition (according to H. Y. Sandwith, of Kew) are from the "Muri bush", a sort of scrub savanna formation dominated by Humiria floribunda, on sand, on the Demerara River near its confluence with the Kuruduni River and on the Essequibo-Demerara divide near this point. The species closely resembles P. sessiliflorus Mart., from Bahia, Brazil, and P. subsessilis Moldenke from Lará, Venezuela, but differs in its technical characters.

SCHLEGELIA MONACHINOI Moldenke, sp. nov.

Frutex scandens vel epiphyticus; caulibus crassis obscure tetragonis griseis glabrescentibus; ramis ramulisque densiuscule patentique pubescentibus; nodis non annulatis; foliis op-

positis vel approximatis; petiolis percrassis densiuscule breviterque pubescentibus, in statu senectute glabrescentibus; laminis crasse coriaceis rigidis ellipticis obtusis, ad basin acutis, integris et leviter subrevolutis, in statu juventute utrinque parce pubescentibus, in statu senectute utrinque glabris, saepe basin versus utrinque punctulatis; inflorescentiis axillaribus, racemis simplicibus vel breviter brachiatis.

Woody vine or epiphytic shrub; stems coarse, rather obscurely tetragonal, gray, glabrous in age; branches and branchlets more slender, rather densely spreading-pubescent with brownish hairs; nodes not annulate; principal internodes 1.5--4.5 cm. long; leaves decussate-opposite or approximate; petioles very stout and coarse, 0.8--2 cm. long, rather densely short-pubescent when young, glabrescent in age; blades thick-coriaceous, rigid, clear-green above, paler beneath, elliptic, 9--20 cm. long, 5.5--11 cm. wide, blunt (often deformed) at the apex, acute at the base, entire and slightly subrevolute along the margins, sparsely pubescent on both surfaces when immature, glabrous when mature, often punctulate toward the base on both surfaces; midrib coarse, plane or subimpressed above, sharply prominent beneath; secondaries about 5 per side, arcuate-ascending, plane or subimpressed above, sharply prominent beneath; larger veinlet reticulation rather conspicuous on both surfaces; inflorescence axillary, racemiform; racemes 1 or 2 per axil, 3--11 cm. long, 1.5--2 cm. wide in anthesis, 5 cm. wide in fruit, simple or with a very few greatly abbreviated 2- or 3-flowered branches; peduncles slender, 8 mm. long or less, often obsolete, densely brown-pubescent; rachis slender, densely brown-pubescent, less so in age; bracts numerous, one subtending each flower and inflorescence-branch, lanceolate, 2--5 mm. long, 1--1.5 mm. wide, attenuate-acuminate at the apex, sessile, glabrous except for the more or less ciliolate margins or sometimes sparsely pilosulous on the back toward the apex; calyx campanulate, heavy, tough, greenish-white, nigrescent in drying, scarious-margined, about 5 mm. long and wide, very sparsely pilosulous on the outside, its rim irregularly 3- or 4-lobed, the lobes broadly triangular and acute; corolla hypocrateriform, its tube broadly cylindric, gradually ampliate above, greenish-white, about 1 cm. long, glabrous, its rim whitish-lilac, more deeply lilac in the throat, 5-lobed, the lobes spreading, unequal, about 5 mm. long, 2--3 mm. wide, glabrous on both surfaces, rounded at the apex; stamens inserted at about the middle of the corolla-tube, equaling the tube or very slightly exerted; filaments glabrous; staminode minute; anthers oblong, about 1 mm. long; pistil borne on a conspicuous annular disk; ovary subglobose, about 1 mm. long and wide, glabrous; fruiting-calyx incrassate, about 5 mm. long and 10 mm. wide, corky-margined, irregularly triangular-lobed, sparsely pilosulous or glabrescent; fruit fleshy, purple, 10--12 mm. in diameter, containing abundant purple juice, glabrous.

The type of this species was collected by José Cuatrecasas (no. 19579) at La Cumbre, alt. 1680 m., in the Cordillera Occidental, Valle del Cauca, Colombia, on February 25, 1945, and is

deposited in the Britton Herbarium at the New York Botanical Garden. The species is related to *S. macrophylla* Ducke and *S. albiflora* Kuhlmann, from both of which it differs abundantly by its simple inflorescences, the size and shape of its bracts, and in other characters.

STACHYTARPHETA AUSTRALIS var. **NEOCALEDONICA** Moldenke, var. nov.

Hæc varietas a forma typica speciei dentibus foliorum argutis divaricatis recedit.

This variety differs from the typical form of the species in having the teeth on its leaf-margins very sharply acute and divergent. The plant gives the appearance of having the inflorescences of *S. australis* and the leaves of *S. urticaefolia*, but the leaves appear to be smaller than is typical for the latter species.

The type was collected by Friedrich Richard Rudolf Schlechter (no. 14881) on hills, alt. 50 m., at Paita, New Caledonia, on October 2, 1902, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

STACHYTARPHETA RORAIMENSIS var. **PUBESCENS** Moldenke, var. nov.

Hæc varietas a forma typica speciei ramis ramulisque rachideque bracteolisque calyceque petiolisque laminisque foliorum utrinque dense pubescentibus recedit.

This variety differs from the typical form of the species in having the branches, branchlets, rachis, bractlets, calyx, fruiting-calyx, petioles, and both leaf-surfaces densely pubescent.

The type was collected by Francisco Tamayo (no. 2765) in rocky places at Cerro Kanaimé, near Santa Elena, Gran Sabana, Bolívar, Venezuela, on February 13, 1946, and is deposited in the herbario Nacional de Venezuela at Caracas.

TITHYMALOPSIS IPECACUANHAE f. **RUBRA** Moldenke, f. nov.

Hæc forma a forma typica speciei foliis orbiculatis rubris recedit.

This form differs from the typical form of the species in its red or purple orbicular leaf-blades.

The type was collected by H. N. Moldenke (no. 10994) in dry sandy pinebarrens at Forked River, Ocean County, New Jersey, on August 31, 1937, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA BONARIENSIS f. **ALBIFLORA** Moldenke, f. nov.

Hæc forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by A. V. de la Sota (no. 82) on Isla "El Cavadito", dept. Guleaguay, Entre Ríos, Argentina, on January 13, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA CAMPESTRIS Moldenke, sp. nov.

Herba pumila; caule radicante gracillima; ramis procumbentibus vel adscendentibus gracillimis obtusiuscule tetragonis parce adpresso-pubescentibus; foliis oppositis; petiolis gracillimis strigillosis; laminis chartaceis ovatis obtusis, ad basin acutis vel subcuneatis, profunde 3-lobatis, lobis irregulariter incisus, lobulis obtusis, supra parce strigillosis, subtus in reticulo venularum strigillosis.

Low herb; stems creeping, very slender, shortly appressed-pubescent; branches procumbent or ascending, very slender, rather obtusely tetragonal, rather sparsely appressed-pubescent; leaves decussate-opposite; petioles very slender, 1--2 mm. long and strigillose; blades chartaceous, uniformly bright-green on both surfaces, ovate in outline, 5--10 mm. long and wide, obtuse at the apex, acute or subcuneate at the base, 3-lobed with deep sinuses, each lobe rather irregularly incised with obtuse lobules, finely strigillose above and on the venation beneath; midrib, secondaries, and veinlets very slender, often subimpressed above, prominulous beneath; inflorescence terminal, spicate, the floriferous portion of the spikes dense, subcapitate when young, later elongating to 15 mm.; peduncles filiform, 1--4 cm. long, puberulent; bractlets narrowly elliptic, about 3 mm. long and 1 mm. wide, attenuate at the apex, ciliate-margined; calyx tubular, about 4 mm. long, 5-angled, 5-costate, 5-apiculate, spreading-ciliate on the angles; corolla hypocrateriform, blue, its tube about 4 mm. long, strigillose above the calyx, its lobes about 2 mm. long, emarginate at the apex, finely strigillose on the outside.

The type of this very distinct species was collected by Raulino Reitz (no. 2392) on a campo, alt. 2000 m., at Campos dos Padres, Santa Catharina, Brazil, on December 16, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA INTERMEDIA var. **LANUGINOSA** Moldenke, var. nov.

Hæc varietas a forma typica speciei caulibus ramisque pedunculisque foliisque densissime lanuginosis recedit.

This variety differs from the typical form of the species in having its stems, branches, peduncles, and leaves (especially the lower surfaces) very densely lanuginous.

The type was collected by Adrian Ruiz Leal (no. 2981) at the edge of a dry river at La Pampa, San Pablo, dept. Tunuyan, Mendoza, Argentina, on February 6, 1935, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA LOBATA var. **GLABRATA** Moldenke, var. nov.

Hæc varietas a forma typica speciei ubique glabris recedit.

This variety differs from the typical form of the species in being completely glabrous throughout.

The type was collected by Padre B. Rambo (no. 2816) at São Francisco de Paulo, Rio Grande do Sul, Brazil, on January 14, 1937, and is deposited in the Britton Herbarium at the New York Botanical Garden. Padre Rambo deserves the highest praise for the noteworthy work he is doing on the flora of this state.

VERBENA NANA Moldenke, sp. nov.

Herba annua pumila; caulibus rectis obtuse tetragonis in siccitate profunde 4-sulcatis dense albo-hirsutulis, pilis plerumque glanduliferis; foliis oppositis; petiolis gracilibus dense hirsutulis; laminis chartaceis ovatis obtusis vel subacutis, ad basin acutis, adpresso-serrulatis utrinque densiuscule glandulifero-pubescentibus; inflorescentiis terminalibus densis.

Dwarf annual herbs 1 dm. or less in height; stems erect, usually with 2 ascending or erect branches at the base, obtusely tetragonal, deeply 4-sulcate in drying, densely hirsutulous with whitish mostly glanduliferous hairs of various lengths standing at right angles to the stem; principal internodes 0.5--2 cm. long; leaves decussate-opposite; petioles slender, 3--11 mm. long, densely hirsutulous like the stem; blades chartaceous, rather uniformly green on both surfaces, ovate, 13--25 mm. long, 8--12 mm. wide, obtuse or subacute at the apex, acute at the base, appressed-serrulate with rather wide, flat, rounded teeth from the widest part to the apex, rather densely pubescent on both surfaces with whitish, stiff, straight, more or less glanduliferous hairs; midrib slender, plane above, subprominent beneath; secondaries slender, 2--5 per side, ascending, subprominulous beneath; veinlet reticulation rather obscure on both surfaces; inflorescence terminal, dense, rather few-flowered, sessile or subsessile; bractlets lanceolate, 4--5 mm. long, glandular-pubescent; calyx tubular, about 11 mm. long, densely hirsutulous with short, whitish, often glanduliferous hairs standing at right angles to the surface, the rim irregularly 5-apiculate, the teeth about 1 mm. long; corolla hypocrateriform, its tube about 15 mm. long, glabrous outside, its limb 5--6 mm. wide, glabrous.

The type of this very distinct species was collected by Ishmael Morel (no. 117) at Pirané, dept. Pirané, Formosa, Argentina, on October 23, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA REITZII Moldenke, sp. nov.

Fruticulus perennis; ramis ramulisque crassiusculis acute tetragonis ubique glabratibus; sarmentis graciusculis sulcatis glabris nitidis; nodis subannulatis; foliis numerosis oppositis sessilibus; laminis chartaceis firmis anguste ellipticis vel oblongis acutis, ad basin amplexicaulibus, superioribus integris, inferioribus irregulariter arguto-serratis glabris sed supra subscabridis; inflorescentiis terminalibus sulcatis.

Shrubby perennial, about 1 m. tall; stems and branches rather stout, acutely tetragonal, glabrate throughout; branchlets more slender, acutely tetragonal, sulcate between the angles, glabrous and shiny throughout; nodes somewhat annulate; principal internodes 1--2.5 cm. long; leaves numerous, decussate-opposite, sessile; blades chartaceous, firm, rather uniformly bright-green on both surfaces, narrowly elliptic or oblong, 1.4--4 cm. long, 2--6 mm. wide, acute at the apex, amplexicaul at the base, the upper ones entire, the lower ones rather irregularly sharp-serrate with 1--3 teeth per side, glabrous but very

slightly scabrid above; midrib very slender, plane or impressed above, prominent beneath; secondaries very slender, 1--5, ascending, obscure or subimpressed above, subprominulous beneath; vein and veinlet reticulation not visible; inflorescence terminal, spicate, the spikes much abbreviated and almost subcapitate, usually in clusters of 3, 1--1.5 cm. long, densely many-flowered; peduncles slender, much abbreviated, 4--14 mm. long, tetragonal, glabrous; bractlets lanceolate, 3--4 mm. long, 1 mm. wide at the base, regularly tapering to the acute apex, glabrous; calyx tubular, 4--5 mm. long, 5-apiculate, glabrous or microscopically strigillose; corolla red, infundibular or hypocrateriform, its tube about 4 mm. long, strigillose, the limb 4--5 mm. wide.

The type of this distinct species was collected by Raulino Reitz (no. 2366) in a wet campo at Campo dos Padres, alt. 1900 m., Santa Catharina, Brazil, on December 16, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX PINNATA var. **ALATA** Moldenke, var. nov.

Haec varietas a forma typica speciei petiolis plerumque plusminusve late alatis recedit.

This variety differs from the typical form of the species in having the petioles usually more or less broadly winged.

The type was collected by Eugene Poilane (no. 2751) at Nhattrung, Annam, French Indochina, on March 9, 1922, and is deposited in the herbarium of the Naturhistoriska Riksmuseet at Stockholm.

LANTANA VIBURNOIDES var. **VELUTINA** Moldenke, var. nov.

Haec varietas a forma typica speciei ramis ramulisque laminisque petiolisque pedunculisque densissime velutinis et pedunculis valde abbreviatis recedit.

This variety differs from the typical form of the species in having its branches, branchlets, petioles, lower leaf-surfaces, and peduncles densely velutinous and in having the peduncles uniformly abbreviated, 1--2 cm. long.

The type was collected by J. G. Myers (no. 6529) in short upland grassland near Azza Forest, Equatorial Province, Anglo-Egyptian Sudan, on May 4, 1937, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LIPPIA PEARSONI Moldenke, sp. nov.

Frutex multiramis; ramis crassiusculis angulatis costatis dense puberulis; ramulis sarmentisque plerumque ternatis gracilibus minute puberulis vel glabrescentibus; foliis plerumque ternatis; petiolis gracilibus pilosulo-puberulis; laminis chartaceis parvis anguste ellipticis vel lanceolatis ad basin apicemque attenuatis obscure serrulatis supra parce strigosis scabris, subtus dense punctatis; inflorescentiis axillaribus spicatis, spicis oblongis dense multifloris.

Shrub 1.5--2 m. tall, much branched; branches rather stout, somewhat angular and ribbed, densely puberulent; branchlets and twigs usually ternate, slender, minutely puberulent or glabres-

cent, often ribbed; nodes not annulate; principal internodes 1--6.7 cm. long; leaves mostly ternate; petioles slender, 1--5 mm. long, pilosulous-puberulent; blades chartaceous, rather uniformly green on both surfaces, small, narrow-elliptic or lanceolate, 2--7 cm. long, 5--15 mm. wide, attenuate at both ends, very finely and rather obscurely serrulate, finely strigose and scabrous above, densely punctate beneath and strigose along the larger venation; midrib slender, subimpressed above, prominent beneath; secondaries very slender, 5--9 per side, ascending, slightly arcuate, subimpressed above, prominulous beneath; veinlet reticulation subimpressed above, only the larger parts distinct beneath; inflorescence axillary, spicate, usually 4--8 per node, the floriferous portion oblong, densely many-flowered, to 15 mm. long; peduncles slender, 5--13 mm. long, appressed-puberulent; bractlets ovate, about 2 mm. long and wide, acute, densely puberulent and resinous-granular; corolla white, barely surpassing the bractlets, the limb about 2 mm. wide, densely puberulent on the outside.

The type of this species was collected by H. H. W. Pearson (no. 2673) in open places between Chibia and Quihita, southern Angola, on May 13, 1909, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The collector notes that the stems and leaves are fragrant, and that the plant is common.

ANOMOSPERMUM GLAUDESCENS Moldenke, sp. nov.

Frutex scandens; ramis graciusculis glabris vel minute puberulis glaucis; foliis irregulariter alternis; petiolis gracilibus glabrescentibus praeter basin; foliis ellipticis supra nitidis subtus glaucis et minute puberulis 6-plexi-nerviis.

Large woody vine; branches rather slender, glabrous or microscopically puberulent, glaucescent; leaves alternate, irregularly disposed, sometimes approximate; principal internodes varying from 5 mm. to 6 cm.; petioles rather slender, 5.5--8 cm. long, microscopically puberulent toward the base, the remainder glabrescent, genuiflexuous just below the apex, the apical thickening 5--10 mm. long, joining the blade 1--4 mm. above its base in subpetate fashion; blades subcoriaceous, elliptic or very slightly subovate-elliptic, bright-green and very shiny above, glaucescent beneath, 11.5--14.5 cm. long, 6.5--8.5 cm. wide, glabrous above, microscopically puberulent beneath; midrib slender, plane above, prominent beneath; secondaries slender, about 5 per side, the 2 lowest pairs issuing in pinnerved fashion from the petiole-apex, plane or very slightly prominulous above, prominent beneath; tertiaries and veinlet reticulation practically indiscernible above, subprominulous beneath, irregular; inflorescence and flowers not seen; fruit yellow, drupaceous, asymmetric, attached at right angles to the pedicel, about 5 cm. long and 4 cm. wide in the dried state, nigrescent in drying; exocarp coriaceous, glabrous, shiny.

The type was collected by R. L. Fróes (no. 23446) on high land in high forest at Javarisinho, on the east side of Rio Tocantins, Pará, Brazil, and is deposited in the Britton Herbarium at the New York Botanical Garden.

THE BOTANICAL SOURCE OF PATAVA OIL

Harold N. Moldenke

In view of the considerable interest in the source and nature of patava oil exhibited in recent years by importers, customs officials, Department of Agriculture agents, and the United States Customs Court, it has been thought advisable to place on record in one easily accessible paper the chief sources of botanical and chemical information on this subject.

The botanical history of patava oil begins with Carl Friedrich Philipp von Martius, who apparently was the first European explorer to discover it, and who was the first botanist to describe and name the tree which produces it. Martius, in his "Historia Naturalis Palmarum", volume 2, page 23 (1823), describes the tree and names it Oenocarpus bataua. He illustrates it well on plates 24 and 25 in this work, and states that a greatly desired drinking decoction is secured from the fruit, extensively used by the local Amerinds and referred to by them as "bataua" (1). On page 21 of this same work Martius founds and describes for the first time the genus Oenocarpus, of which genus this was his second-mentioned species. The generic name, Oenocarpus, signifies "wine fruit", in allusion to the drink obtained from these trees.

The second reference to the plant is by Alfred Russel Wallace, who, in his "Palm Trees of the Amazon", page 127 (1853), reports that the vernacular name for Oenocarpus bataua among the natives of the regions where it grows is "patawá", that the fruit is edible and yields a drink, and that the spinose processes of the leaf-sheaths are used as arrows in native blow-pipes. These arrows are 15 to 18 inches long and are dipped in curare before being used. He tells us that six species of the genus Oenocarpus were known to him, that they prefer dry slightly elevated land, and are not found above 1600 feet elevation. He describes O. bataua as a palm tree growing 50 to 60 feet in height.

Richard Spruce, in "Hooker's Journal of Botany", volume 6, page 334 (1854), has this to say: "After the Caiuá, as to quality of oil, come the various species of Oenocarpus (OE. Bacaba, Batana, disticha, etc.). The oil of these is apparently of finer quality than that of Caiuá [Elais melanococca]; it is colourless and sweet-tasted, and not only excellent for lamps, but for cooking. The shop-keepers of Pará buy Patana-oil of the Indians, and mix it with equal proportions of olive oil, retailing the whole as 'olive-oil', from which, indeed, even the best judges can scarcely distinguish it. I can bear testimony that, for frying fish, oil of Bacaba is equal either to olive-oil or butter. The various species of Oenocarpus abound on the Amazon and Orinoco, and on their tributaries. I have lately seen the Patana in the greatest plenty throughout the Casiquiare, Alto Orinoco, and Cunucunuma. Near the Barra it is fre-

quent, but less so than the Bacaba. The forests opposite San Carlos, extending from the Rio Negro to the Xié, are literally sown with Pataná. The fruit is in season nearly all the year round. We are just now beginning to make use of it, and we shall have it (in unlimited quantity, if there were always Indians to climb the trees) all along until November. I am passionately fond of Pataná-yukissé, and it is the only thing which I shall regret when I leave San Carlos. When I have passed a long time without drinking it, and recommence, I always find it slightly aperient, but this effect passes off in two or three days." This letter was dated at San Carlos del Rio Negro, Venezuela, March 19, 1854.

Next we find mention of it by Berthold Carl Seemann in his "Die Palmen", pages 186--188 (1863) where he states that all the palms that belong to the cocconut tribe produce fruit which contains oil. The genus Oenocarpus shares this latter characteristic, even though it is too widely unrelated to belong to this same tribe. He then quotes part of the passage from Spruce given above (2).

Carl Schaedler, in his "Technologie der Fette und Oele", edition 2, page 844 (1892), states that from the seeds of Oenocarpus bacaba and O. batava of Central and South America is extracted "comu oil", "huile de comou", or "comou butter" which is used in the manufacture of soap and candles (3).

Otto Warburg, writing in H. Sempfer's "Die Tropische Agrikultur", edition 2 by R. Hindorf, volume 1, pages 745--746 (1897), says: "25. Die Patavapalme. Manohmal wird dieser Name auf die aus etwa 17 Arten bestehende Gattung Oenocarpus angewandt; er sollte aber beschränkt bleiben auf die Art Oe. Batava. Die sämtlichen Arten zeigen Übereinstimmung darin, dass sie im tropischen Amerika heimisch sind, wo sie trockne Standorte auf Bodenerhebungen bis zu 500 Meter über dem Meeresspiegel einnehmen. Es sind hohe, majestätische Bäume mit grossen glatten Stämmen und Fiederblättern. Die Blüten sind einhäusig, die Früchte nahezu kugelförmig; letztere sind einsamig und haben geniessbares Fleisch. Die Früchte aller Arten liefern ein vorzügliches Öl, und wenn es in den grössten Mengen von der Patavapalme gewonnen wird, so geschieht es, weil dieselbe am zahlreichsten auftritt, zumal im [p. 746] Gebiete des Orinoco und Amazonenstroms. Dieses Öl wird höher geschätzt als dasjenige der amerikanischen Ölpalme; es ist farblos, von süsslichem Geschmack und kann nicht nur zur Beleuchtung, sondern auch in der Küche verwandt werden. Nur die Indianer machen eine Beschäftigung aus seiner Gewinnung, die, wie kaum erwähnt zu werden braucht, nach rohester Methode erfolgt. Trotzdem wird das Öl in Para zur Verfälschung von Olivöl brauchbar befunden, was das beste Zeugnis für seine Qualität ist. Die Früchte werden ferner zur Bereitung eines sehr beliebten Getränkes benutzt, welches Yukissee genannt wird, übrigens ein Name, den die Indianer des Rio Negro allen Pflanzensäften, ja sogar animalischen Sauen geben. Das Verfahren dabei ist dasselbe, welches ich bereits bei der Assaipalme schildert. Wenn das Yukissee einige Zeit in einem Gefäss steht, steigt der Ölbestandteil an die Ober-

fläche und giebt damit die Erklärung für die nahrhafte und schwach abführende Wirkung dieses Getränkes. -- Auch die Blätter und das Holz der Patavapalme sind verwendbar."

Five years later, E. Liénard, writing in the "Académie des Sciences, Paris, Comptes-rendus", volume 135, pages 593--595 (1902), reported that the endosperm of Oenocarpus bacaba contains mannite, galactose, saccharose, water, and oily substances. The following year E. Bassière, in the "Journal de Pharmacie et de Chimie", series 6, pages 326--329 (1903), reviews the history of the two species, bringing out again the fact that Spruce, Seemann, Warburg, and Schaedler all mentioned the production of oil by O. bataua and O. bacaba, that the oil is used not only for illumination, but also for cooking (4), that the oil is used frequently in Pará, Brazil, as an adulterant of and substitute for olive oil, and that the Amerinds on the Rio Negro make a drink from it called "yulissé". He claims that the oil contains 10.4 percent glycerin and 19 percent of acids whose molecular weight is 289.1.

Two years later a considerable contribution was made by J. Lewkowitsch in his "Chemische Technologie und Analyse der Ole, Fette und Wachse", volume 2, page 125 (1905), where he reports that "comou oil" is secured from the kernels of Oenocarpus bataua and O. bacaba. The kernels were boiled in water by him, whereupon a light-yellow oil was separated. This oil he describes as only half volatile. The experiment, he says, yielded 4.3 percent of free fatty acids. The extraordinarily low saponification value which he found does not agree with the assertion of Bassière that his experiment yielded 10.4 percent of glycerin and that the molecular weight of the fatty acids amounted to 289.1. Also, this worker claims, the assertion cannot be correct that Bassière's experiment yielded only 19 percent of oil-acids. The melting point of the fatty acids is around 19°. (5)

In 1910 C. Grinne, in the "Chemische Revue über die Fett- und Harz-Industrie", volume 17, pages 232--234 (1910), is more definite about the constituents and characteristics of the oil. He reports that the flesh of the fruit is edible. The seeds, which in the dry state are light-brown on the outside and white on the inside, yield on extraction with ether 34.8 percent of a light-yellow somewhat volatile odorless oil with a pleasant taste. This is mentioned in literature under the names of "comouöl", "huile de comou", and "comou oil". Investigations by Grinne gave the following picture of the oil's characteristics: specific gravity 0.9248 at 15° C.; melting point -7.5°; solidifying point -9° C.; refractive index 1.4691 at 15° C.; p.H. or acid-value 1.40; computed free oil-acid 0.71 percent; saponification value 190.5; ester value 189.1; iodine value 80.0; fatty acids 96.6 percent; glycerin 10.33 percent; unsaponifiable material 0.76 percent. The fatty acids extracted from the oil are light-yellow and of a buttery consistency, with a melting point of 19.5° C., a solidification point of 17.8° C., a refractive index of 1.4502 at 45° C., a neutralization value of 190.2, an iodine value of 85.3, and an average molecular weight of 292.2. The residue of the oil has 32.15 percent protein (6).

Carl Wehmer, in his "Die Pflanzenstoffe", edition 1, page 73 (1911), reiterates that the kernels of the fruit of O. bataua yield a fatty oil called "comu oil", "coumou oil", or "patava oil", which is also obtained from O. bacaba. In the endosperm are various mannites, a galactose, and saccharoses. In the oil is found olein as well as glycerides, stable fatty acids, and free acids (7).

Four years later E. R. Bolton and E. M. Jesson, in the "Analyst", London, volume 40, pages 3--9 (1915), reported on their investigation of Oenocarpus distichus. They found the kernels to contain 7.1 percent of oil and the whole fruit 6.7 percent oil. This oil, they found, has a melting point of 36° C., a saponification value of 209.2, a refractive index of 49.0 at 40° C., an iodine value of 55.9, 65.9 percent of free fatty acids, and 2.15 percent of unsaponifiable matter.

G. H. Warburton's English revision of Lewkowitsch's "Chemical Technology and Analysis of Oils, Fats and Waxes", edition 6, pages 245--246 and 678 (1922), gives most of the same information contained in the 1905 work, adding the Italian name "olio di coumou" and the English "patava oil" (an obvious corruption of "batava oil"). He says that the fruit ripens all through the year, and quotes the figures reported by Grimme. In a chart (on page 678) of lesser known vegetable fats he includes O. distichus with the figures reported by Bolton and Jesson (8).

M. Burrett, in the "Notizblatt des Botanischen Gartens und Museums zu Berlin", volume 10, page 304 (1928), reviews the morphological characters of all the described species (9) of Oenocarpus, and segregates from this genus the new genus Jessenia, placing Martius' Oenocarpus bataua into this new genus. He repeats the statement that a popular drink is obtained from the fruits of this palm, which because of its strong oil content is difficult to digest (10). The genus Jessenia differs from Oenocarpus in having more than 6 stamens per flower and because of technical calyx and endosperm characters. The complete synonymy of the species, up to this point, then, is as follows:

Oenocarpus bataua Mart., Hist. Nat. Palmarum 2: 23, pl. 24 & 25. 1823; Drude in Mart., Fl. Bras. 32: 468, pl. 108.

1882; Barbosa-Rodriguez, Sertum Palmarum Brasiliensium 1: 45, pl. 41 & 42. 1903.

Oenocarpus bataua Wallace, Palm Trees of the Amazon 31, pl. 10 & 11. 1853.

Oenocarpus Batana Spruce in Hook., Journ. Bot. 6: 334. 1854.

Oenocarpus Batava Spruce ex Seem., Die Palmen 186. 1863.

Oenocarpus Patava Schaedler, Technologie der Fette und Oele, ed. 2, 844. 1892.

Oenocarpus batana Mart. ex Lewkowitsch, Chemische Technologie und Analyse der Öle, Fette und Wachse 2: 125. 1905.

Oenocarpus batava Mart. ex Grimme, Chemische Revue über die Fett- und Harz-Industrie 17: 233--234. 1910.

Jessenia bataua (Mart.) Burrett, Notizbl. Bot. Gart. Berlin

10: 300--304. 1928.

In 1929 the second edition of Carl Wehmer's "Die Pflanzenstoffe" appeared. On page 124 of volume 1 he repeats the information given in his 1911 work and adds that the kernels of Oenocarpus bataua contain 4.8 percent of fatty oil. He also adds the data about O. distichus reported by Bolton and Jesson (11). On page 1322 he gives "Oenocarpus GR. (?)" as the source of a fatty oil.

In 1931 E. Stock reported on a new analysis in "Farbenzeitung", Berlin, volume 36, page 830. He described the oil as beautifully light-yellow, giving off no odor, and with a pleasant taste. It was designated as "Oenocarpus oil" and was said to have been extracted from a species of palm. The constants which he ascertained were as follows: specific gravity at 15° C. 0.9244; solidification point 7.5° C.; refractive index 1.4700; p.H. or acid value 1.38; saponification value 190.0; iodine value 80.6; unsaponifiables 0.84 percent. The oil yielded 96 percent of fatty acids. These exhibited the following characteristics: melting point 18.9° C.; refractive index at 45° C. 1.4492; iodine value 86.7. The oil can be rendered completely colorless through Fuller's-earth. Also, he says, we are here concerned with a slightly volatile oil, whose volatility can be increased by the addition of cobalt-siccative, but in his opinion the volatility is still not sufficient. (12)

In the same year F. W. Friese, in "Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse, und Harze", volume 38, page 216 (1931), reported on some little-known Brazilian palm-oils (13). Here he lists oils from Oenocarpus bacaba, called "bacaba"; from O. multicaulis, called "bacaba y"; from O. bataua, called "bataua"; and from O. discolor, called "pindoba". He states that the oils from the first two of these are used locally for shampooing, cooking, and glossing, but are not usable industrially.

Liberty Hyde Bailey, in his "Standard Cyclopedia of Horticulture", volume 2, page 328 (1935), gives the following pertinent information: "Oenocarpus (wine fruit, as some of the species yield a beverage).....A few species of South American tall pinnatisect-leaved palms.....little grown but numerous in the Amazon and Orinoco countries.....some species yield useful oil. Fruit a medium-sized usually purple or black berry. O. bacaba Mart. and O. bataua Mart. are the species most likely to be mentioned."

In the "Ergänzungsband zur zweite Auflage" of Carl Wehmer's "Die Pflanzenstoffe", page 139 (1935), the data reported by Stock for his unidentified species of Oenocarpus are summarized, and Friese's paper is also noted (14).

Finally, in a bulletin entitled "Brazil, 1943", published by the Ministry of Foreign Affairs of that nation, it is stated that Oenocarpus bacapa Mart. is the source of a vegetable oil. Its density, solidification number, iodine number, and refractive index are given. It is said to be used in soaps and stearin.

We find, thus, that during the period from 1823 to 1943, the

fact that an oil is obtained from species of Oenocarpus is mentioned by 17 recognized professional botanists or chemists (12 of whom mention O. bataua specifically). That the genus is the source of a drink is mentioned in 9 references, and that the endosperm is a source of mannites, galactose, and saccharose is mentioned in three. This ought definitely to answer the claims made in certain quarters that Oenocarpus palms are not oil-producing palms and that no such claims are extant in scientific literature. The exact quotations of the more important of these references are appended herewith as footnotes for the convenience of Customs Court lawyers and other interested persons, who may not have ready access to all of the original books and journals.

- (1) "...ob fructus decoctione potum exoptatissimum praebentes India magni habita atque Bataua nomina salutat."
- (2) "...alle zu den Cocoinen gehörige Palmen...ölspendende Früchte tragen. Die Gattung Oenocarpus theilt letztere Eigenschaft, obgleich sie weit entfernt ist zu den Cocoinen zu gehören. Spruce bemerkt, wo er von den Oelpalmen des Amazonenstromes spricht: 'Nach der Caiaué (Elaeis melanococca Gaertn.) kommen, der Güte des Oels nach, die verschiedenen Arten von Oenocarpus (Oe. Bacaba, Batava, disticha u.s.w.). Das Öl derselben ist anscheinend sogar besser als das des Caiaué. Es ist farblos und süß, nicht allein gut für Lampen, sondern auch für die Küche. In den Läden von Pará mischt man dies von den Indianern gekauft Öl zu gleichen Theilen mit Olivenöl und verkauft das Ganze als letzteres, von welchem es auch in der That von den besten Kennern kaum unterschieden werden kann. Ich bezeuge, dass zum Fischebacken dies Oenocarpusöl sowohl der Butter wie dem Olivenöl gleichkommt!''.
- (3) "Oenocarpus Bacaba Mart. und Oenocarpus Patava S. in Mittel- und Südamerika. Aus den Samen wird das Comuöl, Huile de Comou, Comou Butter, gepresst und zur Seifen- und Kerzenfabrikation verwendet."
- (4) "...non seulement pour l'éclairage, mais pour les usages culinaires."
- (5) "Comouöl wird aus den Kernen der folgenden beiden Palmenspezies erhalten: Oenocarpus batana Mart. und O. bacaba Mart. Die Kerne werden mit Wasser ausgekocht, wobei sich ein hellgelbes Öl ausscheidet. Das Öl wird als ein halbtrocknendes Öl beschrieben. Die untersuchte Probe enthielt 4,3 Proz. freier Fettsäuren. Die ausserordentlich niedrige Verseifungszahl stimmt nicht mit der Angabe Bassières überein, dass die Probe 10,4 Proz. Glycerin lieferte und dass das Molekulargewicht der Fettsäuren 289,1 betrug. Auch kann die Angabe, dass die Probe nur 19 Proz. Ölsäure enthielt, nicht richtig sein. Der Schmelzpunkt der Fettsäuren liegt bei 19°."

- (6) "O. batava. Das Fruchtfleisch ist geniessbar. Der in trockenem Zustande aussen hellbraune, innen weisse Samen liefert bei der Extraktion mit Aether 34,8% eines hellgelben, schwach trocknenden Oels ohne Geruch und mit angenehmen Geschmack. Es wird in der Literatur erwähnt unter den Namen: Comuöl, Huile de Comou, Comou Oil. Die Untersuchung ergab folgendes Bild: Spez. Gewicht 0,9248 (15°); Schmelzpunkt -7,5°; Erstarrungspunkt -9°; Brechungsindex 1,4691 (15°); Säurezahl 1,40; berechnet auf freie Oelsäure 0,71%; Verseifungszahl 190,5; Esterzahl 189,1; Iodzahl (Wijs) 80,0; Fettsäure 96,06%; Glycerin 10,33%; Unverseifbares 0,76%. Die aus dem Oel gewonnenen Fettsäuren sind hellgelb und von butterartige Konsistenz. Schmelzpunkt 19,5°; Erstarrungspunkt 17,8°; Brechungsindex 1,4502 (45°); Neutralisationszahl 190,2; Iodzahl (Wijs) 85,3; Mittleres Molekulargewicht 292,2. Die Extraktionsrückstand enthält 32,15% Protein."
- (7) "192. Oenocarpus Batava Mart. -- Brasilien. -- Früchte (Kern) liefern fettes Oel (Comuöl, Coumouöl, Patavaöl, s. folgender Art.).
"193. O. bacaba Mart. -- Südamerika. -- Wie vorige Art aus Fruchtkernen Comuöl. Im Endosperm verschiedene Mannane, ein Galaktan, Saccharose 1), das Comuöl enth. Olein neben Glyceriden fester Fettsäuren u. freie Säuren 2)....1) LIÉNARD, s. Nr. 191, Note 4 [=Liénard, Compt. Rend. 135: 593. 1902]. 2) BASSIERE, J. Pharm. Chim. 1903. 323; cf. Lewkowitsch, Technologie d. Fette. II. Bd. 1905. 125."
- (8) "Coumou oil 3), batava oil 4). French - Huile de coumou. German - Comuöl. Italian - olio di coumou. Coumou oil is obtained from the kernels of the palm trees: Oenocarpus batava, Mart., O. bacaba, Mart., which frequently occur in tropical South America and bear a berry-like fruit, which ripens all through the year. The kernels are boiled out with water, when a pale yellow limpid oil - 'coumou oil' - rises. Grimme 1) ascertained the following characteristics: oil -- specific gravity at 15° C. 0.9248; solidifying point -9° C.; melting point -7.5° C.; saponification value 190.5; iodine value 80.0; refractive index at 15° C. 1.4691. Fatty acids -- insoluble acids and unsaponifiable 96.06%; unsaponifiable 0.76%; solidifying point 17.8; melting point 19.5; neutralization value 190.2; iodine value 85.3; refractive index at 45° 1.4502.....lesser known vegetable fats....O. distichus - S. Am. - 7.1% yield; melting point 36; saponification value 209.2; iodine value 55.0; refractive index 49.0 at 40° C."
- (9) The "Index Kewensis" and its 8th and 9th supplements, plus the Gray Herbarium's Card Index of New Species, list 26 accepted species in Oenocarpus, and about a dozen excluded names. Burrett in 1928 accepts as valid only eleven species in the genus Oenocarpus.

- (10) "Aus den Früchten wird ein beliebtes Getränk gewonnen, das indessen wegen des starken Ölgehalts schwer verdaulich ist."
- (11) "387. Oenocarpus Batava Mart. 'Patava'. - Brasilien - Früchte (Kern) 4,8 % fettes Öl, Comuöl (Counouöl, Patavaöl, s. folgende). GRIMME, Chem. Rev. Fett-Ind. 1910. 17. 233 (C.C. 1910. II. 1713).
"388. O. bacapa Mart. - Südamerika. - Wie vorige Art aus Fruchtkern Comuöl mit Olein, Glyceriden fester Fettsäure u. freie Säuren 2). Endosperm verschied. Mannane, e. Galacten, Saccharose 1).....1) LIÉNARD, S. Nr. 386. Note 4 [= Liénard, Compt. Rend. 135: 593. 1902]. 2) BASSIERE, J. Pharm. Chim. 1903. 323. cf. LEWKOWITSCH, Technologie d. Fette. II. Bd. 1905. 125.
"389. O. disticha*. - Tropen - Samen mit 7,1% fett. Öl. BOLTON u. JESSON, Analyst 1915. 40. 3 (C.C. 1915. I. 530). Constanten!"
- (12) "Das zweite Öl war schön hellgelb, zeigte keinen Geruch und hatte angenehmen Geschmack. Es wurde als 'Oenocarpusöl' bezeichnet und soll von einer Palmenart gewonnen werden. Die Konstanten waren: Spez. Gewicht 15° C. 0,9244; Erstarrungspunkt 7,5° C.; Brechungsindex 1,4700; Säurezahl 1,38; Verseifungszahl 190,0; Jodzahl n. Wijs 80,6; Unverseifbares 0,84%. An Fettsäuren waren in dem Öl 96 % enthalten. Sie zeigten: Schmelzpunkt 18,9° C.; Brechungsindex 45° C. 1,4492; Jodzahl n. Wijs 86,7. Das Öl konnte durch Bleicherde 'Tonsil' vollständig farblos erhalten werden. Auch hier handelt es sich um ein schwach trocknendes Öl, dessen Trockeneigenschaft aber durch Zusatz Kobaltsikkativ etwas verbessert werden konnte. Nach unseren Auschauungen genügt aber trotzdem die Trockenfähigkeit nicht."
- (13) "Ueber einige weniger bekannte brasilianische Palmöle."
- (14) "774. Oenocarpus-Species (nicht angegeben) (Fam. Palmae). s. z. Aufl. I. 124. Das Öl enth. 0,84% Unverseifbares (=unsaponifiables) 1). -- Ueber fette Öle von Oenocarpus, Euterpe u. a. Palmenarten Brasiliens s. Unters. 2).....
1) Stock, s. Moquilia tomentosa, Constanten des Oeles [=Farbenzeit. 36: 830. 1931]. 2) Friese, Chem. Umschau Fette u. Öle etc. 1931. 38: 216 (C.C. 1931. II. 2235)."

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, AND SYMPHOREMACEAE.
SUPPLEMENT 11

Harold N. Moldenke

Since the preparation of the tenth supplement to this list in March of this year almost 4400 additional specimens of these groups have been examined and annotated by me from the Museo Nacional at Rio de Janeiro, Estacion Experimental Agronomica at Santiago de las Vegas (Cuba), Royal Botanic Gardens at Kew, Museo de Historia Natural at Montevideo, Naturhistoriska Riksmuseet at Stockholm, Trinidad and Tobago Botanical Garden at Port-of-Spain (Trinidad), Facultad Nacional de Agronomia at Medellin (Colombia), Museo Comercial de Venezuela at Caracas, Academia de Ciencias at Havana, Colegio Salesiano at Lima, Colegio Notra Señora de la Caridad at Santiago de Cuba, Museo de Historia Natural at Santiago (Chile), Colegio Anchieta at Porto Alegre (Brazil), and Facultad de Farmacia e Odontologia at São Paulo, as well as from the herbaria of Oberlin College at Oberlin (Ohio), the Alan Hancock Foundation of the University of Southern California at Los Angeles, Canal Zone Biological Area on Barro Colorado Island (Canal Zone), Instituto Botanico at São Paulo, University of Georgia at Athens, University of Massachusetts at Amherst, Parque Nacional da Serra dos Orgãos at Teresopolis (Brazil), and the College of Pharmacy at New York City, and from the Government Herbarium at Salisbury (Southern Rhodesia), Fritz Lemperg Herbarium at Hatzendorf (Austria), E. Matuda Herbarium at Escuintla (Mexico), R. T. Roig Herbarium at Santiago de las Vegas (Cuba), Ruiz Leal Herbarium at Godoy Cruz (Argentina), and the Britton Herbarium at the New York Botanical Garden in New York City. This wealth of material has brought to light 81 new county or parish records, 186 new state, province, or department records, and 175 new country or island records, as well as the necessity for making certain emendations in previous records and certain nomenclatural changes hereinafter noted.

UNITED STATES OF AMERICA:

Vermont:

Verbena hastata L. (East Caledonia County)

New York:

Verbena hastata L. (Schenectady & Schoharie Counties)

Verbena urticifolia var. leiocarpa Perry & Fernald (Tompkins County)

Pennsylvania:

xVerbena Engelmannii Moldenke (Allegheny County)

Virginia:

Verbena urticifolia L. (Bedford County)

Georgia:

Verbena rigida Spreng. (Bibb County)

Florida:

Avicennia nitida Jacq. (Martin County)

Lantana montevidensis (Spreng.) Briq. (Pasco County)

Phyla nodiflora var. reptans (H.B.K.) Moldenke (Collier County)

Stylodon carneus (Medic.) Moldenke (Bradford, Calhoun, Jefferson, Palm Beach, & Seminole Counties)

Verbena tenuisecta Briq. (Franklin County)

Ohio:

Phyla lanceolata (Michx.) Greene (Butler County)

Verbena bracteata Lag. & Rodr. (Butler, Lake, & Richland Counties)

~~x~~Verbena Engelmannii Moldenke (Lorain & Lucas Counties)

Verbena hastata L. (Columbiana, Lake, Licking, & Lucas Counties)

Verbena simplex Lehm. (Lorain County)

Verbena stricta Vent. (Butler & Lake Counties)

Verbena urticifolia L. (Erie, Lake, Licking, Lucas, & Sheffield Counties)

Illinois:

Verbena bracteata Lag. & Rodr. (La Salle County)

Kentucky:

Verbena simplex Lehm. (Madison County)

Tennessee:

Verbena bracteata Lag. & Rodr. (Humphreys County)

Verbena simplex Lehm. (Humphreys County)

Wisconsin:

Verbena bracteata Lag. & Rodr. (Pepin County)

Verbena stricta Vent. (Rock County)

Minnesota:

Verbena bracteata Lag. & Rodr. (Goodhue County)

Verbena hastata L. (Anoka, Girard, Nicollet, & Polk Counties)

Verbena stricta f. albiflora Wadmond (Hennepin County)

South Dakota:

Phyla cuneifolia (Torr.) Greene (Brule County)

Verbena bipinnatifida Nutt. (Brule County)

Verbena bracteata Lag. & Rodr. (Brule County)

Kansas:

Phyla incisa Small (Stafford County)

Verbena bipinnatifida Nutt. (Wabaunsee County)

Verbena urticifolia var. leiocarpa Perry & Fernald (Riley County)

Missouri:

Gallicarpa americana L. should be deleted; the record was erroneous

~~x~~Verbena moschina Moldenke (Jackson County)

Arkansas:

~~x~~Verbena Rydbergii Moldenke (Benton County)

Verbena simplex Lehm. (Benton County)

Verbena stricta Vent. (Benton County)

Verbena urticifolia L. (Benton County)

Louisiana:

Stylocdon carneus (Medic.) Moldenke (Orleans Parish)

Wyoming:

Verbena bracteata Lag. & Rodr. (Park & Platte Counties)

Utah:

Verbena stricta Vent. (Utah County)

Nebraska:

Verbena bipinnatifida Nutt. (Sherman County)

Verbena bracteata Lag. & Rodr. (Cass County)

Verbena urticifolia L. (Nemaha County)

Oklahoma:

Phyla cuneifolia (Torr.) Greene (Kingfisher County)

Phyla nodiflora (L.) Greene (Creek County)

Verbena canadensis (L.) Britton (Kingfisher County)

Verbena Halei Small (Bryan County)

Texas:

Aloysia lycioides var. Schulzae (Standl.) Moldenke -- this is the correct orthography of this trinomial; add Bee County

Aloysia macrostachya (Torr.) Moldenke (Bexar County)

Phyla incisa Small (Hays County)

Verbena Cloverae Moldenke -- this is the correct orthography of this binomial

Verbena Halei Small (Robertson County)

Verbena plicata Greene (Jim Hogg & Wilson Counties)

Verbena pumila Rydb. (Maverick County)

Verbena quadrangulata Heller (Jim Hogg County)

New Mexico:

Verbena Gooddingii Briq. (DeBaca County)

Verbena Wrightii A. Gray (Eddy County)

Arizona:

Aloysia lycioides var. Schulzae (Standl.) Moldenke -- this is the correct orthography for this trinomial

Verbena pinetorum Moldenke (Cochise County)

Washington:

Verbena hastata L. -- delete Hood River & Wasco Counties for these were recorded by a printer's error

Oregon:

Verbena hastata L. (Hood River & Wasco Counties)

MEXICO:

Aloysia lycioides var. Schulzae (Standl.) Moldenke -- this is the correct orthography for this trinomial -- add Durango

Lippia durangensis Moldenke (Sinaloa & Zacatecas)

Verbena ambrosifolia Rydb. (Sonora)

Verbena ciliata Benth. (Morelos)

Verbena elegans H.B.K. (Sinaloa)

Verbena Gooddingii Briq. (San Luis Potosí)

Verbena Russellii Moldenke (Chihuahua & Sonora)

GUATEMALA:

Aegiphila hoffmannioides Standl. & Steyerl. (Huehuetenango)*

Clerodendrum mimicum Standl. & Steyerl. (Huehuetenango)*

Clerodendrum pithecobium Standl. & Steyerl. -- delete the asterisk because the species is now known from Panama

PANAMA:

Citharexylum Cooperi Standl. (Chiriqui)

Clerodendrum pithecobium Standl. & Steyerl. (Coclé)

Clerodendrum Pittieri Moldenke (Panamá)

Cornutia grandifolia (Schlecht. & Cham.) Schau. (Coclé)

Lantana glandulosissima Hayek (Darien)

Lantana velutina Mart. & Gal. (Chiriqui & Panamá)

CUBA:

Bouchea prismatica (L.) Kuntze (Oriente)

Tectona grandis L. f. (Oriente)

JAMAICA:

Phyla nodiflora var. reptans (H.B.K.) Moldenke

COLOMBIA:

Bouchea prismatica var. brevirostra Grenz. (Santander)

Citharexylum Ulei Moldenke (Putumayo)

Duranta Mutisii L. f. (Valle del Cauca)

Lantana armata Schau. (Cauca)

Lantana boyacana Moldenke (Antioquia)

Lantana oujabensis Schau. (Vaupés)

Lantana oujabensis var. punctata Moldenke (Cauca & Cundinamarca)

Lantana trifolia L. (Norte de Santander)

Lantana trifolia f. hirsuta Moldenke (Valle del Cauca)

Lippia alba (Mill.) N. & Br. (Atlántico)

Lippia micromera Schau. (Norte de Santander)

Lippia origanoides H.B.K. (Norte de Santander)

Petrea peruviana Moldenke (Vaupés)

Phyla betulifolia (H.B.K.) Greene (Antioquia)

Stachytarpheta cayennensis (L. C. Rich.) Vahl (Cauca)

Verbena litoralis H.B.K. (Vaupés)

Verbena litoralis var. albiflora Moldenke (Chocó)

VENEZUELA:

Aegiphila ternifolia (H.B.K.) Moldenke (Miranda)

Clerodendrum ternifolium H.B.K. (Bolívar, Falcón, Sucre)

Lantana trifolia f. hirsuta Moldenke (Cojedes & Federal District)

Stachytarpheta roraimensis var. pubescens Moldenke (Bolívar)*

PERU:

Lantana armata Schau. (Lima)

Petrea peruviana Moldenke -- delete the asterisk, for the

species is now known also from Colombia

BRAZIL:

- Aegiphila chrysantha Hayek (Amazonas)
Aegiphila Froesi Moldenke (Amazonas)*
Aloysia brasiliensis Moldenke (Paraná)*
Aloysia Sellowii (Briq.) Moldenke (Santa Catharina)
Citharexylum solanaceum Cham. (Santa Catharina)
Citharexylum Ulei Moldenke -- delete the asterisk, for the
 species is now known also from Colombia
Clerodendrum calamitosum L. (Pará)
Lantana aristata var. Hoehnei Moldenke (Mattogrosso)*
Lantana cordatibracteata Moldenke (Rio de Janeiro)*
Lantana montevidensis f. albiflora Moldenke -- delete the
 asterisk, for the form is now known also from Argentina
Stachytarpheta Maximiliani var. glabrata Schau. (Pernambuco)
Verbena alata Cham. (Rio Grande do Sul & Santa Catharina)
Verbena jordanensis Moldenke (Rio Grande do Sul)
Verbena lobata var. glabrata Moldenke (Rio Grande do Sul)*

BOLIVIA:

- Acantholippia hastulata Griseb. (Potosi)
Junellia longidentata Moldenke (Potosi)
Lantana canescens H.B.K. (Potosi)
Lantana micrantha Briq. (Potosi)
Verbena calliantha Briq. (Santa Cruz)
Verbena glutinosa Kuntze (Santa Cruz)

PARAGUAY:

- Aloysia osadensis Hassler & Moldenke*
Lantana aristata var. brachypoda Briq.*
Lantana fucata f. albiflora Moldenke
Phyla nodiflora var. reptans (H.B.K.) Moldenke
Stachytarpheta elatior Schrad.
Verbena Kuntzeana Moldenke -- delete the asterisk, for the
 species is now known also from Argentina
Verbena pinnatiloba (Kuntze) Moldenke -- delete the asterisk,
 for the species is now known also from Argentina

URUGUAY:

- Aloysia lycioides var. revoluta Moldenke*

CHILE:

- Diostea cinerascens (Schau.) Moldenke (Santiago)
Junellia asparagoides (Gill. & Hook.) Moldenke -- delete
 the asterisk, for the species is now known from Argentina
Junellia caespitosa (Gill. & Hook.) Moldenke -- delete the
 asterisk, for the species is now known from Argentina
Junellia comatibracteata (Kuntze) Moldenke (Tarapacá)
Junellia spatulata (Gill. & Hook.) Moldenke (O'Higgins)

ARGENTINA:

- Acantholippia deserticola (R. A. Phil.) Moldenke -- delete
 La Rioja
Acantholippia hastulata Griseb. -- delete Catamarca, Los

- Andes, and Salta for these records were based on misidentifications; also delete the asterisk, for the species is now known also from Bolivia
- Acantholippia riojana Hieron. & Moldenke (La Rioja)*
- Citharexylum Jorgensenii (Lillo) Moldenke (Catamarca)
- Junellia Ameghinii (Speg.) Moldenke (Chubut)
- Junellia asparagoides (Gill. & Hook.) Moldenke (La Rioja & Mendoza)
- Junellia caespitosa (Gill. & Hook.) Moldenke (Mendoza)
- Junellia connatibracteata (Kuntze) Moldenke (Chubut) -- delete the asterisk, for the species is now known from Chile
- Junellia longidentata Moldenke -- delete the asterisk, for the species is now known also from Bolivia
- Junellia punctulata Hieron. & Moldenke (La Rioja)*
- Junellia seriphioides var. tomentosa Moldenke -- to be deleted
- Lampaya Hieronymi Schum. & Moldenke (Catamarca)
- Lantana aristata var. angustifolia (Kuntze) Moldenke (Jujuy)
- Lantana Canara var. aculeata (L.) Moldenke (Misiones)
- Lantana fucata f. albiflora Moldenke (Jujuy) -- delete the asterisk, for the form is now known also from Paraguay
- Lantana Grisebachii Stuck. (Tuumán)
- Lantana montevidensis (Spreng.) Briq. (Chaco)
- Lantana montevidensis f. albiflora Moldenke (Chaco)
- Phylla nodiflora var. canescens (H.B.K.) Moldenke (Chaco & Tuumán)
- Stachytarpheta australis f. albiflora Moldenke (Jujuy, Misiones, & Salta)
- Stachytarpheta cayennensis (L. C. Rich.) Vahl (Chaco)
- Verbena aristigera S. Moore (Formosa)
- Verbena bonariensis L. (Entre Ríos, Formosa, & San Juan)
- Verbena bonariensis f. albiflora Moldenke (Entre Ríos)*
- Verbena Cabreræ Moldenke (Catamarca & Santiago del Estero)
- Verbena calliantha Briq. (Catamarca)
- Verbena brasiliensis Vell. (Entre Ríos, San Juan, & Santiago del Estero)
- Verbena bonariensis var. conglomerata Briq. (Entre Ríos & Misiones)
- Verbena Cheitmaniana Moldenke (Formosa)
- Verbena dissecta Willd. (Formosa & Mendoza)
- Verbena glandulifera Moldenke (San Luis)
- Verbena glutinosa Kuntze -- delete the asterisk, for the species is now known also from Bolivia
- Verbena gracilescens (Cham.) Herter (Formosa, La Rioja, San Juan, & San Luis)
- Verbena incisa Hook. (Buenos Aires, Entre Ríos, Jujuy, & Misiones)
- Verbena intermedia Gill. & Hook. (Mendoza)
- Verbena intermedia var. lanuginosa Moldenke (Mendoza)*

- Verbena Isabellei Briq. (Buenos Aires)
Verbena Kuntzeana Moldenke (Salta)
Verbena laciniata (L.) Briq. (Mendoza & Salta)
Verbena litoralis H.B.K. (Chaco & Formosa)
Verbena nana Moldenke (Formosa)*
Verbena peruviana (L.) Britton (Misiones)
Verbena phlogiflora Cham. (Formosa)
Verbena pinnatiloba (Kuntze) Moldenke (Corrientes & Misiones)
Verbena pogostoma Klotzsch (San Juan & Santa Fé)
Verbena pulchra Moldenke (Misiones)
Verbena rigida Spreng. (Entre Ríos)

ST. HELENA:

- Verbena bonariensis L.

CANARY ISLANDS:

- Verbena officinalis L. (Tenerife)

PORTUGAL:

- Verbena officinalis L.

POLAND:

- Verbena supina L.

CYPRUS:

- Lantana Camara var. mista (L.) L. H. Bailey

JUGOSLAVIA:

- Verbena officinalis L. (Montenegro)

RUMANIA:

- Verbena officinalis L.

TUNISIA:

- Verbena officinalis L.

- Verbena supina f. erecta Moldenke

EGYPT:

- Premna resinosa (Hochst.) Schau.

FRENCH WEST AFRICA:

- Lippia Chevalierii Moldenke (Senegambia)

ANGLO-EGYPTIAN SUDAN:

- Lantana viburnoides (Forsk.) Vahl (Nubia)

- Lantana viburnoides var. velutina Moldenke (Mongalla)

- Lippia grandifolia Hochst. (Mongalla)

ERITREA:

- Lippia kisi A. Rich.

ABYSSINIA:

- Lippia kisi A. Rich.

BRITISH SOMALILAND:

- Lantana viburnoides (Forsk.) Vahl

- Lippia carviadora var. minor Meikle

SENEGAL:

- Lippia Chevalierii Moldenke

SIERRA LEONE:

- Lippia rugosa A. Chev.

DAHOMEY:

Lippia rugosa A. Chev.

SOUTHERN NIGERIA:

Lippia rugosa A. Chev.

CAMEROONS:

Lantana viburnoides var. velutina Moldenke

Premna quadrifolia Schum. & Thonn.

Vitex lokundjensis Pieper -- delete the asterisk, for the species is now known from Southern Rhodesia

FRENCH EQUATORIAL AFRICA:

Premna angolensis Gürke (Gabun)

BELGIAN CONGO:

Lippia adoënsis Hochst.

UGANDA PROTECTORATE:

Lippia adoënsis Hochst.

TANGANYIKA TERRITORY:

Lantana rugosa Thunb.

Lantana viburnoides var. Schimperi Moldenke

Lantana viburnoides var. velutina Moldenke

Lippia lupuliformis Moldenke

Lippia plicata J. G. Baker

Premna senensis Klotzsch

KENYA:

Lantana rugosa Thunb.

Lippia africana var. villosa Moldenke

Lippia carviadora Meikle*

Lippia carviadora var. minor Meikle

Lippia lupuliformis Moldenke

Stachytarpheta urticaefolia (Salisb.) Sims

ANGOLA:

Lantana Dinteri Moldenke (Huilla)

Lippia Oatesii Rolfe

Lippia Pearsoni Moldenke (Huilla)*

Premna angolensis Gürke -- delete the asterisk, for the species is now known also from Gabun.

NORTHERN RHODESIA:

Clerodendrum Buchneri Gürke

Clerodendrum tanganyikense J. G. Baker

Clerodendrum Wildii Moldenke

Lantana rugosa Thunb.

Lippia africana var. villosa Moldenke.

Lippia plicata J. G. Baker -- delete the asterisk, for the species is now known also from Tanganyika Territory

SOUTHERN RHODESIA:

Clerodendrum discolor var. oppositifolium Thomas

Clerodendrum glabrum var. ovale (Klotzsch) H.H.W.Pearson

Clerodendrum pusillum Gürke

Clerodendrum Wildii Moldenke

Duranta repens L.

Holmskioldia mucronata (Klotzsch) Vatke

Lantana Camara var. aculeata (L.) Moldenke

Lippia javanica (Burm. f.) Spreng.

Lippia Oatesii Rolfe -- delete the asterisk, for the species is now known also from Angola

Lippia Whytei Moldenke

Phyla nodiflora (L.) Greene

Verbena bonariensis L.

Verbena officinalis L.

Vitex lokundjensis Pieper

Vitex nimbassae var. parviflora (Gibbs) Pieper -- this is the correct orthography for this trinomial

BRITISH NYASALAND PROTECTORATE:

Clerodendrum Wildii Moldenke

Lippia africana var. scaberrima Moldenke

Lippia javanica (Burm. f.) Spreng.

PORUGUESE EAST AFRICA:

Holmskioldia mucronata (Klotzsch) Vatke -- delete the asterisk for the species is now known from Southern Rhodesia

SOUTHWEST AFRICA:

Lantana Dinteri Moldenke -- delete the asterisk for the species is now known also from Angola

SWAZILAND:

Vitex Wilmsii var. reflexa (H.H.W.Pearson) Pieper

UNION OF SOUTH AFRICA:

Clerodendrum glabrum var. ovale (Klotzsch) H.H.W.Pearson -- delete the asterisk for the variety is now known also from Southern Rhodesia

Lippia lupuliformis Moldenke -- delete the asterisk for the species is now known also from Kenya

MADAGASCAR:

Stachytarpheta jamaicensis (L.) Vahl

UNION OF SOCIALIST SOVIET REPUBLICS:

Verbena supina f. erecta Moldenke (Azerbaijan)

ISRAEL:

Verbena tenuisecta Briq.

INDIA:

Callicarpa arborea Roxb. (United Provinces)

Callicarpa candicans (Burm. f.) Hochr. (Bengal)

Callicarpa dichotoma (Lour.) K. Koch

Callicarpa tomentosa (L.) Murr. (Madras)

Geunsia pentandra (Roxb.) Merr.

Premna cordifolia Roxb. (Bombay)

Premna corymbosa var. obtusifolia (R. Br.) Fletcher (Travancore)

Premna micrantha Schau. (Bombay)

Premna racemosa Wall. (Assam & Bengal)

Stachytarpheta mutabilis (Jacq.) Vahl (Sikkim)

PAKISTAN:

Callicarpa arborea Roxb. (East Bengal)
Callicarpa marophylla Vahl (East Bengal)
Verbena supina L. (Sind)

BURMA:

Verbena officinalis L. (Southern Shan States)

CEYLON:

Tectona grandis L. f.

CHINA:

Callicarpa candicans (Burm. f.) Hochr. (Kiangsi)
Callicarpa Lingii Merr. (Kiangsi)
Callicarpa longipes Dunn (Kiangsi)
Callicarpa Loureiri Hook. & Arn. (Kiangsi)
Callicarpa integerrima Champ. (Kiangsi)
Callicarpa rubella Lindl. (Kweichow)
Callicarpa Tsiangii Moldenke (Kiangsi)*
Premna interrupta Wall. (Kwangsi)
Premna puberula Pampanini (Kwangsi)
Premna szemaensis P'ei (Kwangsi)

TSU-SIMA ISLAND:

Callicarpa mollis Sieb. & Zucc.

FORMOSA:

Callicarpa pilosissima var. Henryi Yamamoto*
Premna foetida Reinw.

JAPAN:

Callicarpa dichotoma (Lour.) K. Koch (Kiusiu)
Callicarpa japonica Thunb. (Musashi)
Callicarpa japonica var. luxurians Rehd. (Enoshima & Hokkaido)
Callicarpa mollis Sieb. & Zucc. (Musashi)

LANTAU ISLAND:

Callicarpa Loureiri Hook. & Arn.
Callicarpa nudiflora Hook. & Arn.

FRENCH INDO-CHINA:

Callicarpa candicans (Burm. f.) Hochr. (Laos)
Clerodendrum cochinchinense Dop (Annam)
Clerodendrum Godefroyi var. lanceolatum Dop -- to be deleted
Clerodendrum Godefroyi var. oblanceolatum Dop (Cambodia)*
Clerodendrum japonicum (Thunb.) Sweet (Tonkin)
Hymenopyramis siamensis Craib (Cambodia)
Phyla nodiflora (L.) Greene (Tonkin)
Premna foetida Reinw. (Cambodia)
Vitex pinnata L. (Cochin-china)
Vitex Hollrungii Warb. (Cochin-china)
Vitex Pierreana Dop (Cochin-china)
Vitex pinnata var. alata Moldenke (Annam)*

FEDERATED MALAY STATES:

Premna sterculiifolia var. cordata King & Gamble -- delete the asterisk, for the variety is now known also from

Celebes

PHILIPPINE ISLANDS:

Stachytarpheta urticaefolia (Salisb.) Sims (Cebu)

MARIANNA ISLANDS:

Callicarpa elegans Hayek (Rota)

CAROLINE ISLANDS:

Callicarpa candicans (Burm. f.) Hochr. (Angaur)

Clerodendrum ineme (L.) Gaertn. (Angaur & Pingelap)

Premna corymbosa var. obtusifolia (R. Br.) Fletcher (Kusaie & Pingelap)

MARSHALL ISLANDS:

Clerodendrum ineme (L.) Gaertn. (Bikini, Eniaetok, Mellu, & Namu)

SUMATRA:

Callicarpa brevipes (Benth.) Hance

Premna pyramidata Wall.

Premna trichostoma Miq.

JAVA:

Stachytarpheta bogoriensis Zoll. & Mor. -- to be deleted

Stachytarpheta jamaicensis (L.) Vahl

LABUAN:

Premna corymbosa var. obtusifolia (R. Br.) Fletcher

CELEBES:

Callicarpa pilosissima Maxim.

Premna corymbosa var. angustior (C. B. Clarke) Fletcher

Premna Gaudichaudii Schau.

Premna sterculifolia var. cordata King & Gamble

Premna trichostoma Miq.

SOLOMON ISLANDS:

Geunsia farinosa Blume (Bougainville)

NEW CALEDONIA:

Stachytarpheta australis var. neocaledonica Moldenke*

FIJI ISLANDS:

Premna Gaudichaudii Schau. (Fulanga, Kambara, & Kandavu)

AUSTRALIA:

Callicarpa cana L. -- to be deleted

Callicarpa candicans (Burm. f.) Hochr. (Queensland)

Verbena litoralis H.B.K. (New South Wales)

Verbena rigida Spreng. (Victoria)

CULTIVATED:

Aloysia lycioides var. paraguariensis (Briq.) Moldenke
(Paraguay & Uruguay)

Aloysia oblanceolata Moldenke (Paraguay)*

Aloysia triphylla (L'Hér.) Britton (Ohio)

Citharexylum fruticosum var. subvillosum Moldenke (Cuba)

Citharexylum spinosum L. (Southern Rhodesia)

Clerodendrum somalense Chiov. (Aden)

Duranta repens L. (Uruguay)

Lantana fucata Lindl. (Uruguay)

- Lantana glandulosissima Hayek (Italy)
Lippia hirsuta L. f. (Colombia)
Phyla nodiflora (L.) Greene (Egypt)
Premna microphylla Turcz. (Japan)
Tectona grandis L. f. (French Indo-china)
Verbena bracteata Lag. & Rodr. (Germany)
Verbena bonariensis L. (Canary Islands & Sweden)
Verbena elegans H.B.K. (Sweden)
Verbena elegans var. asperata Perry (Sweden)
Verbena hastata L. (Austria & Netherlands)
~~Verbena hybrida~~ Voss (Finland, Madeira, & Ohio)
Verbena mendocina R. A. Phil. (Sweden)
Verbena platensis Spreng. (Uruguay)
Verbena robusta Greene (Sweden)
Verbena simplex Lehm. (Sweden)
Verbena stricta Vent. (Denmark & Sweden)
Vitex divaricata Sw. (Scotland)

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
ERIOCAULACEAE. SUPPLEMENT 5

Harold N. Moldenke

Since the preparation of the previous supplement to this list another eight hundred specimens of this group have been examined and annotated from the herbaria at the Naturhistoriska Riksmuseum at Stockholm, the Royal Botanic Gardens at Kew, the University of Georgia at Athens, the Facultad Nacional de Agronomia at Medellin, the Museo Comercial at Caracas, the Instituto Botanico della University at Florence (Italy), Oberlin College at Oberlin (Ohio), the University of Massachusetts at Amherst, and the Colegio Notra Señora de la Caridad at Santiago de Cuba, as well as the Government Herbarium at Salisbury (Southern Rhodesia), the Britton Herbarium at the New York Botanical Garden, the C. C. Deam Herbarium at Bluffton (Indiana), and the Fritz Lempert Herbarium at Hatzendorf (Austria). This material has brought to light 10 new county or parish records, 27 new state, province, or department records, and 112 new country or island records, as well as certain necessary corrections of previously published records. There are also 99 additional names to be added to the alphabetized list of scientific names proposed in this group as published by me as a supplement to my original list.

UNITED STATES OF AMERICA:

Vermont:

Eriocaulon septangulare With. (Chittenden County)

New York:

Eriocaulon septangulare With. (Tioga County)

South Carolina:

Eriocaulon compressum Lam. (Dorchester County)

Georgia:

Syngonanthus flavidulus (Michx.) Ruhl. (Wayne County)

Florida:

Eriocaulon compressum Lam. (Escambia County)

Eriocaulon decangulare L. (Collier County)

Lachnocaulon Engleri Ruhl. (Osceola County)

Lachnocaulon minus (Chapm.) Small (Orange & Seminole Counties)

Wisconsin:

Eriocaulon septangulare With. (Douglas County)

CUBA:

Eriocaulon melanocephalum Kunth (Pinar del Río)

COLOMBIA:

Paepalanthus Barkleyi Moldenke (Antioquia)*

Paepalanthus fasciculatus (Rottb.) Körn. (Amazonas)

Paepalanthus pilosus (H.B.K.) Kunth (Antioquia)

Paepalanthus planifolius var. alpestris Körn. (Antioquia)

Tonina fluviatilis Aubl. (Chocó)

BRITISH GUIANA:

Paepalanthus lilliputianus Moldenke*

BRAZIL:

Eriocaulon Deslandesii Alv. Silv. (Santa Catharina)

Eriocaulon vaginatum Körn. (Rio Grande do Sul)

Paepalanthus brachyphyllus Ruhl. (Amazonas)

Paepalanthus Catharinae Ruhl. (Rio Grande do Sul)

Paepalanthus cururensis Moldenke (Pará)*

Paepalanthus dichotomus Klotzsch (Amazonas)

Paepalanthus Hilairei Körn. (Bahia)

Paepalanthus planifolius (Bong.) Körn. (São Paulo)

Paepalanthus planifolius var. conduplicatus Ruhl. (São Paulo)

Paepalanthus Ruhlindii Alv. Silv. (Rio Grande do Sul)

Syngonanthus akurimensis var. amazonicus Moldenke (Amazonas)*

Syngonanthus amazonicus Moldenke (Amazonas)*

Syngonanthus Blackii Moldenke (Pará)*

Syngonanthus euschemus Ruhl. (Pará)

Syngonanthus gracilis (Körn.) Ruhl. (Pará)

Syngonanthus niveus (Bong.) Ruhl. (São Paulo)

Syngonanthus paraënsis Ruhl. (Amazonas)

Syngonanthus reflexus Gleason (Pará)

Syngonanthus simplex (Miq.) Ruhl. (Amazonas)

Syngonanthus Widgrenianus (Körn.) Ruhl. (Paraná)

FRENCH GUINEA:

Paepalanthus Lamarckii Kunth

SIERRA LEONE:

Eriocaulon Adamesii Meikle*

LIBERIA:

Paepalanthus Lamarckii Kunth

SOUTHERN RHODESIA:

Eriocaulon africanum Hochst.Eriocaulon amphibium Rendle*Eriocaulon annuum Milne-RedheadEriocaulon bifistulosum Van Heurck & Muell.-Arg.Eriocaulon Buchananii Ruhl.Eriocaulon decipiens N. E. Br.Eriocaulon inyangense Arwidsson*Eriocaulon lacteum RendleEriocaulon matopense Rendle*Eriocaulon mutatum N. E. Br.Mesanthemum africanum MoldenkeSyngonanthus Schlechteri Ruhl.Syngonanthus Wahlbergii (Wilkstr.) Ruhl.

TANGANYIKA TERRITORY:

Eriocaulon annuum Milne-Redhead -- delete the asterisk, for the species is now known also from Southern RhodesiaPaepalanthus Lamarckii Kunth

BRITISH NYASALAND PROTECTORATE:

Eriocaulon decipiens N. E. Br.

PORTUGUESE EAST AFRICA:

Mesanthemum africanum Moldenke (Gazaland)Syngonanthus Schlechteri Ruhl. -- delete the asterisk, for the species is now known also from Southern Rhodesia

KOREA:

Eriocaulon atrum NakaiEriocaulon decemflorum Maxim.Eriocaulon nipponicum Maxim.Eriocaulon parvum Körn.Eriocaulon sikokianum Maxim.Eriocaulon sphagnicolum Ohwi*Eriocaulon tenuissimum Nakai*

QUELPART ISLAND:

Eriocaulon atrum NakaiEriocaulon decemflorum Maxim.Eriocaulon hondoense SatakeEriocaulon robustius (Maxim.) Mak.

FORMOSA:

Eriocaulon Buergerianum Körn.Eriocaulon Miyagianum Koidz.Eriocaulon suishaense Hayata -- delete the asterisk, for the species is known also from the Liukiu Islands

Eriocaulon trisectum Satake*

JAPAN:

Eriocaulon alpestre var. perpusillum Nakai -- to be deletedEriocaulon atroides Satake (Honshiu)*Eriocaulon atroides f. nanum Satake (Honshiu)*Eriocaulon atrum Nakai (Hokkaido, Kiushiu, Shikoku, & Tenegashima); delete the asterisk, for the species is now known also from Quelpart IslandEriocaulon atrum var. intermedium Nakai*Eriocaulon atrum var. platypetalum Satake*Eriocaulon Buergerianum Körn. (Honshiu, Kiushiu, & Shikoku)Eriocaulon cauliferum Mak. (Honshiu)Eriocaulon cinereum R. Br. (Kiushiu, Shikoku, Tenegashima, Tsushima, & Yakushima)Eriocaulon decemflorum Maxim. (Honshiu & Yakushima)Eriocaulon hananogoense Masamune (Yakushima)*Eriocaulon heleocharioides Satake (Honshiu)*Eriocaulon hondoense Satake (Izu Schiohito & Shikoku); delete Yezo and the asterisk; the species occurs also on Quelpart IslandEriocaulon japonicum Körn. (Honshiu)Eriocaulon kusiroense Miyabe & Kudo (Hokkaido)*Eriocaulon Matsumurae Nakai (Honshiu)Eriocaulon Miquelianum Körn. (Honshiu, Kiushiu, Shikoku, & Tenegashima)Eriocaulon Miquelianum var. atrosepalum Satake*Eriocaulon monococos Nakai (Hokkaido & Honshiu)Eriocaulon Nakasimamum Satake (Kiushiu)*Eriocaulon nanellum Ohwi (Honshiu)*Eriocaulon nanellum var. albescens Satake (Honshiu)*Eriocaulon nanellum var. filamentosum Satake (Honshiu)*Eriocaulon nipponicum Maxim. (Hokkaido, Kiushiu, & Shikoku)Eriocaulon nipponicum var. glaberrimum Satake*Eriocaulon nosoriense Ohwi (Honshiu)Eriocaulon nudicuspe Maxim. (Honshiu)Eriocaulon pallescens (Nakai) Satake (Hokkaido)*Eriocaulon parvum Körn. (Honshiu, Kiushiu, & Shikoku); delete the asterisk for the species is known also from KoreaEriocaulon robustius (Maxim.) Mak. (Hokkaido, Tenegashima, & Tsushima); delete YezoEriocaulon robustius var. perpusillum (Nakai) Satake*Eriocaulon Sekimotoi Honda (Honshiu)*Eriocaulon Sekimotoi f. glabrum Satake (Honshiu)*Eriocaulon senile Honda (Honshiu, Kiushiu, Shikoku, & Tenegashima)Eriocaulon sikokianum Maxim. (Honshiu & Shikoku) -- delete the asterisk for the species is now known also from Korea



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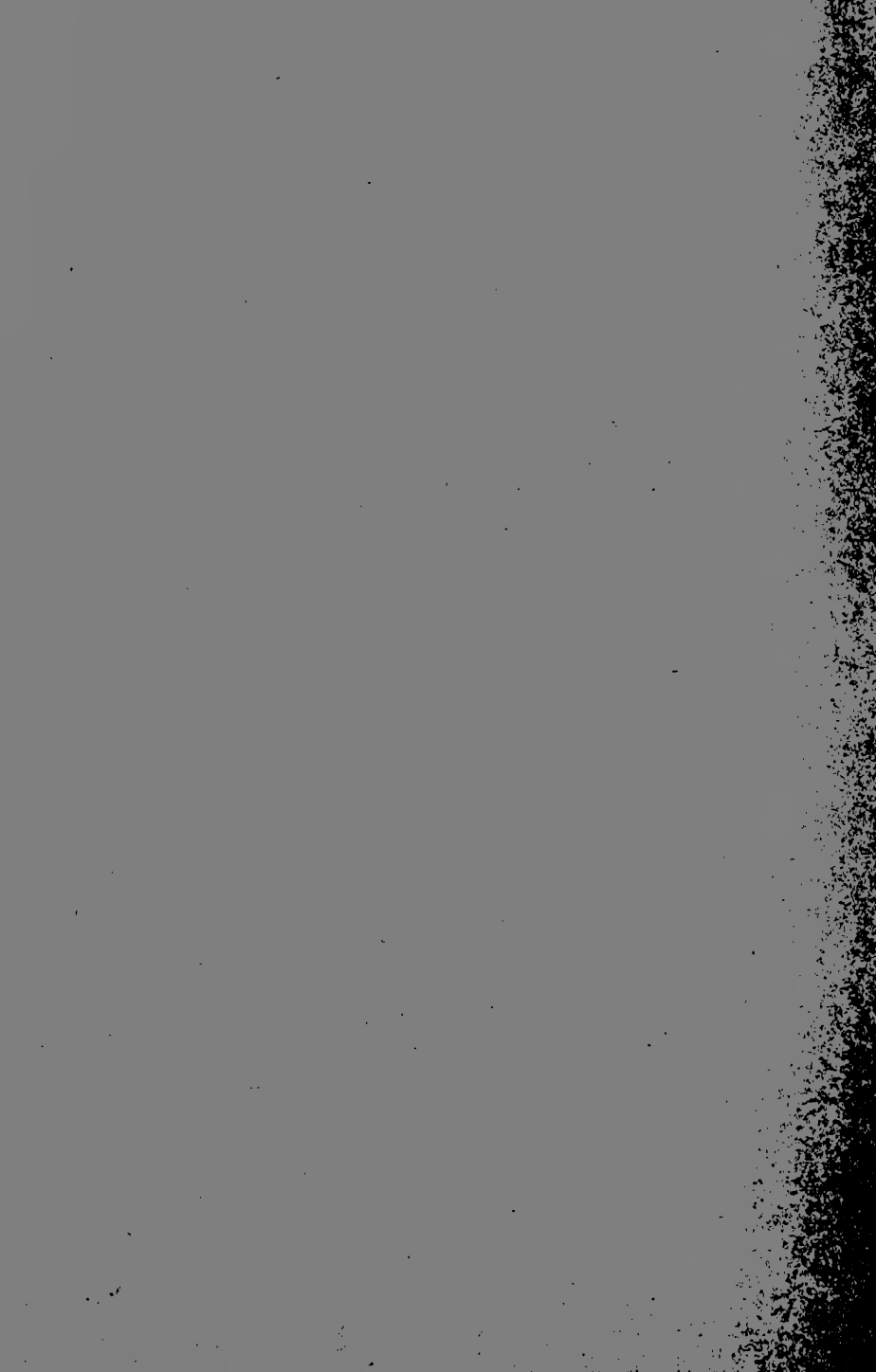
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STUDIES IN ANTILLEAN BOTANY

1. A Check-List of the Palms of Cuba

- Alex D. Hawkes -

The palms of Cuba are still incompletely known, a statement which unhappily can be repeated concerning virtually every palm flora of the world. Through the admirable efforts of Hermano León (Joseph S. Sauget y Barbier) of the Colegio de la Salle, in La Habana, however, our knowledge of these fascinating plants has been materially increased in the past few decades. Quantities of critical revision still remain to be done on the Palmae of this fabulous island, but due to the unceasing efforts of Hno. León, we now are acquainted with some seventeen genera of indigenous palms, containing seventy-five specific concepts, and numerous varietal forms.

A listing of these palms, now considered native to Cuba, follows. The province or provinces in which each species occurs is appended.

1. Acocelorrhaphé Wrightii (Griseb. & Wendl.) Becc. Webbia 2 (1907) 109. Las Villas to Pinar del Rio, Isle of Pines.
2. Acrocomia aculeata (Jacq.) Lodd. ex Mart. Hist. Nat. Palm. 3 (1845-50) 286, 323. Naturalized from Lesser Antilles.
3. Acrocomia armentalis Bailey Hortus Second (1941) 22. Throughout Cuba and the Isle of Pines.
4. Acrocomia pilosa León in Mem. Soc. Cubana Hist. Nat. 14 (1940) 52. Eastern Oriente.
5. Acrocomia subinermis León ex Bailey Gent. Herb. 4 (1941) 474. Habana.
6. Bactris cubensis Burret in Svensk. Vet. Akad. Handl. s.3, 6, vii (1928) 25. Oriente.
- *7. Calyptronoma Clementis (León) A.D. Hawkes, trans. nov. (Calyptrogyne Clementis León) Oriente.
8. Calyptronoma dulcis (Wright ex Griseb.) Bailey Gent. Herb. 4 (1938) 168. Pinar del Rio, Habana, Santa Clara, Oriente; Isle of Pines.
9. Calyptronoma intermedia Wendl. Kerch. Palm. (1878) 238, nomen. Pinar del Rio.
- *10. Calyptronoma microcarpa (León) A.D. Hawkes, trans. nov. (Calyptrogyne microcarpa León) Las Villas.
11. Coccothrinax Acunana León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 128. Oriente; Pico Turquino.
12. Coccothrinax Alexandri León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 122. Oriente.

- 12a. Coccothrinax Alexandri León var. nitida León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 123. Oriente.
13. Coccothrinax argentea (Lodd. ex Schult. & Schult.) Sarg. in Bot. Gaz. 27 (1899) 89. Cultivated only!
- 13a. Coccothrinax argentea (Lodd. ex Schult. & Schult.) var. guantanamoense León Mem. Soc. Cub. Hist. Nat. 13 (1939) 135. Oriente, ?Camaguey.
14. Coccothrinax Bermudezii León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 124. Oriente: Baracoa.
15. Coccothrinax clarensis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 147. Las Villas.
- 15a. Coccothrinax clarensis León var. brevifolia León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 148. Camaguey.
- 15b. Coccothrinax clarensis León var. perrigida León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 149. Camaguey.
16. Coccothrinax crinita Becc. in Webbia 2 (1907) 334. Pinar del Rio, Las Villas.
17. Coccothrinax fragrans Burr. in Kungl. Sv. Vet. Akad. Handl. 6, vii (1929) 15. Oriente.
18. Coccothrinax Garciana León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 143. Oriente.
19. Coccothrinax Gundlachii León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 149. Oriente.
20. Coccothrinax Hiorami León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 135. Oriente.
21. Coccothrinax littoralis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 138. Matanzas, Las Villas, Camaguey, Oriente.
22. Coccothrinax Martii (Griseb. & Wendl.) Becc. in Webbia 2 (1907) 305. ?Oriente.
23. Coccothrinax Miraguama (HBK) Becc. in Webbia 2 (1907) 295, as Miraguano, as to description. Habana, Matanzas, Las Villas, Camaguey, Oriente.
- 23a. Coccothrinax Miraguama (HBK) Becc. var. arenicola León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 115. Pinar del Rio, Las Villas; Isle of Pines.
- 23b. Coccothrinax Miraguama (HBK) Becc. var. cupularis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 117. Las Villas.
- 23c. Coccothrinax Miraguama (HBK) Becc. var. macroGLOSSa León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 118. Oriente.
- 23d. Coccothrinax Miraguama (HBK) Becc. var. havanensis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 116. Habana.
- 23e. Coccothrinax Miraguama (HBK) Becc. var. roseocarpa León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 117. Matanzas.
24. Coccothrinax muricata León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 129. Camaguey.
- 24a. Coccothrinax muricata León var. savannarum León in Mem.

- Soc. Cub. Hist. Nat. 13 (1939) 130. Oriente.
25. Coccothrinax pauciramosa Burr. in Kungl. Sv. Vet. Akad. Handl. 6, vii (1929) 19. Oriente.
26. Coccothrinax pseudorigida León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 145. Camaguey.
- 26a. Coccothrinax pseudorigida var. acaulis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 146. Camaguey.
27. Coccothrinax rigida (Griseb. & Wendl.) Becc. in Webbia 2 (1907) 299. Oriente.
28. Coccothrinax Salvatoris León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 125. Oriente, Camaguey.
29. Coccothrinax saxicola León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 141. Oriente.
30. Coccothrinax Victorini León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 139. Oriente.
31. Coccothrinax Yuraguana (A. Rich.) León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 119. Pinar del Rio.
- 31a. Coccothrinax Yuraguana (A. Rich.) León var. orientalis León in Mem. Soc. Cub. Hist. Nat. 13 (1939) 121. Camaguey, Oriente.
32. Cocos nucifera L. Sp. Plant. (1753) 1188. Throughout Cuba and the Isle of Pines, especially on the coast.
33. Colpotherinax Wrightii Wendl. ex Bailey Hortus (1930) 166. Pinar del Rio; Isle of Pines.
34. Copernicia Baileyana León in Rev. Soc. Geog. Cuba 4 (1931) 52. Habana, Pinar del Rio, Las Villas, Camaguey, Oriente.
- 34a. Copernicia Baileyana León var. laciniosa León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 224. Oriente.
35. Copernicia Brittonorum León in Rev. Soc. Geog. Cuba 4 (1931) 19. Las Villas.
36. Copernicia Burretiana León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 208. Las Villas, Camaguey.
37. Copernicia Clarkii León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 213. Oriente.
38. Copernicia Cowellii Britt. & P. Wils. in Bull. Torrey Bot. Club 41 (1914) 17. Camaguey.
39. Copernicia Curbeloi León in Rev. Soc. Geog. Cuba 4 (1931) 23. Oriente.
40. Copernicia Curtissii Becc. in Webbia 2 (1907) 176. Isle of Pines.
41. Copernicia fallaense León in Rev. Soc. Geog. Cuba 4 (1931) 21. Habana, Camaguey.
42. Copernicia gigas Ekman ex Burr. in Sv. Vet. Akad. Handl. s. 3, 6, vii (1928) 3. Las Villas, Camaguey, Oriente.
43. Copernicia glabrescens Wendl. ex Becc. in Webbia 2 (1907) 170. Pinar del Rio.
- 43a. Copernicia glabrescens Wendl. ex Becc. var. havanensis León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 217. Habana.
44. Copernicia hospita Mart. Hist. Nat. Palm. 3 (1838) 243, 319. Las Villas, Camaguey, Oriente.
- 44a. Copernicia hospita Mart. var. clarensis León in Mem.

- Soc. Cub. Hist. Nat. 10 (1936) 219. Las Villas.
45. Copernicia humicola León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 221. Oriente.
46. Copernicia longiglossa León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 210. Oriente.
47. Copernicia Molinetti León in Rev. Soc. Geog. Cuba 4 (1931) 25. Las Villas.
48. Copernicia occidentalis León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 218. Pinar del Rio.
49. Copernicia pauciflora Burr. in Kungl. Sv. Vet. Akad. Handl. s.3, 6, vii (1929) 9. Pinar del Rio.
50. Copernicia ramosissima Burr. in Sv. Vet. Akad. Handl. s.3, 6, vii (1929) 8. Matanzas.
51. Copernicia rigida Britt. & P.Wils. in Bull. Torrey Bot. Club 41 (1914) 17. Las Villas, Camaguey, Oriente.
52. Copernicia Roigii León in Rev. Soc. Geog. Cuba 4 (1931) 17. Oriente.
53. Copernicia Sueroana León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 215. Las Villas, Camaguey, Oriente.
54. Copernicia textilis León in Rev. Soc. Geog. Cuba 4 (1931) 24. Las Villas.
55. Copernicia Torreana León in Rev. Soc. Geog. Cuba 4 (1931) 40. Habana, Pinar del Rio, Matanzas, Las Villas, Camaguey.
56. Copernicia vespertilionum León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 212. Las Villas, Camaguey, Oriente.
57. Copernicia Yarey Burr. in Kungl. Sv. Vet. Akad. Handl. s.3, 6, vii (1929) 7. Camaguey, Oriente.
- 57a. Copernicia Yarey Burr. var. robusta León in Mem. Soc. Cub. Hist. Nat. 10 (1936) 221. Oriente.
58. Elaeis guineensis Jacq. Select. Stirp. Amer. 1 (1763) 280. Naturalized in Oriente; native in Africa.
59. Euterpe globosa Gaertn. Fruct. Sem. Pl. 1 (1788) 24. Oriente.
60. Gaussia princeps Wendl. Goett. Nachr. (1856) 328. Pinar del Rio.
61. Hemithrinax compacta (Griseb. & Wendl.) Hook.f. in Benth. & Hook. Gen. Pl. 3, ii (1883) 931. Oriente.
62. Hemithrinax Ekmaniana Burr. in Sv. Vet. Akad. Handl., s.3, 6, vii (1929) 9. Las Villas.
63. Hemithrinax rivularis León. Oriente.
64. Hemithrinax savannarum León. Oriente.
65. Pseudophoenix Sargentii Wendl. ex Sarg. Bot. Gaz. 11 (1886) 314. North coast and adjacent islands, Las Villas, Camaguey, Oriente.
66. Roystonea lenis León. Oriente.
67. Roystonea regia O.F.Cook in Science, s.2, 12 (1900) 479, in note. Throughout Cuba and Isle of Pines.
- 67a. Roystonea regia O.F.Cook var. maisiana Bailey Gent. Herb. 3 (1935) 376. Oriente.
- 67b. Roystonea regia O.F.Cook var. pinguis Bailey Gent. Herb. 3 (1935) 378. Oriente.

68. Roystonea stellata León. Oriente.
69. Roystonea violacea León. Oriente.
70. Sabal florida Becc. in Webbia 2 (1907) 46. Las Villas.
71. Sabal Yapa Wright ex Becc. in Webbia 2 (1907) 64. Pinar del Río, Habana.
72. Sabal parviflora Becc. in Webbia 2 (1907) 43. Throughout Cuba, probably Oriente; Isle of Pines.
73. Scheelea cubensis Burr. in Notizbl. Bot. Gart. Berl. 10 (1929) 671. Cuba, unknown since type collection by Gundlach.
74. Thrinax Drudei Becc. in Webbia 2 (1907) 269. Pinar del Río.
75. Thrinax punctulata Becc. in Webbia 2 (1907) 280. Pinar del Río, Habana, Matanzas.
76. Thrinax Wendlandiana Becc. in Webbia 2 (1907) 265. Throughout Cuba and Isle of Pines, principally along coasts.

STUDIES IN FLORIDA BOTANY

6. A Key to the Genera of Florida Orchids*

Alex D. Hawkes

The eighty-seven known species of the Orchidaceae to date recorded from Florida are distributed in thirty-seven genera. The indigenous representatives range in number from several monotypic aggregations (Basiphyllaea, Bletia, Pleurothallis, Zeuxine) to such polytypic groups as Habenaria, Epidendrum, Spiranthes, and Oncidium.

The following dichotomous key is a greatly simplified one, relying on readily evident vegetative and floral-hue characters whenever possible.

I. EPIPHYTIC PLANTS

- A. Plants leafless.
 - 1. Flowers very large and showy, green and white.....
.....29. Polyrrhiza
 - 1. Flowers minute, green or greenish..5. Campylocentrum
- A. Plants with leaves.
 - 1. Flowers non-resupinate with lip uppermost.....
.....30. Polystachya
 - 1. Flowers resupinate, with lip lowermost.
 - a. Pollinia 2 or 4.....10. Cyrtopodium
 - i. Pollinia 2.
 - b. Plants with pseudobulbs.
 - ii. Flowers large, yellow and brown, with long-caudate segments..3. Brassia
 - ii. Flowers small, yellowish, not long-caudate.....23. Macradenia
 - b. Plants without pseudobulbs or with very small ones. (N.B.: Oncidium floridanum Ames has prominent pseudobulbous thickenings but is placed with the relatively bulbless other members of its genus for convenience.)
 - ii. Stems elongate, with a solitary apical leaf.
 - c. Flowers yellow or white, bell-shaped; plant large....27. Pleurothallis
 - c. Flowers magenta or red, spreading; plant very small..20. Lepanthopsis

*The previous parts of this serial have appeared, or are presently appearing in the journal LLOYDIA.

- ii. Stems very shortly pseudobulbous, with several leaves.
 - c. Flowers short-spurred, white or lilac.18. Ionopsis
 - c. Flowers spurless, white, brown, purple, or yellow.....26. Oncidium
- i. Pollinia 4; plants with or without pseudobulbs.
 - b. Flowers solitary, borne from base of plant..25. Maxillaria
 - b. Flowers solitary, several or numerous, borne from apex of stem or bulb..11. Epidendrum

II. VINE-LIKE PLANTS

- A. Plants vine-like, terrestrial or epiphytic, with fleshy fruits.....36. Vanilla

III. TERRESTRIAL PLANTS

(N.B.: Oncidium floridanum Ames is usually a terrestrial species, but is placed in Section I of this key with the epiphytes, as the other members of its genus within our area are of epiphytic habit, and this species may occasionally adapt itself to that mode of growth.)

- A. Plants leafless, fleshy, with an erect inflorescence of showy flowers.....
 - 1. Pollinia 4.....8. Corallorrhiza
 - 1. Pollinia 8.....16. Hexalectris
- A. Plants leafy.
 - 1. Pollinia elongated into caudicles, emerging from base of the erect-anther-cells..15. Habenaria
 - 1. Pollinia-bases or caudicle-apices (if present) emerging from apex of anther.
 - a. Leaves plicate.
 - 2. Flowers reddish or green, generally not opening.....35. Tropidia
 - 2. Flowers opening fully or at least partially.
 - b. Sepals and petals greatly dwarfed by lip...20. Liparis
 - b. Sepals and petals not greatly smaller than lip
 - 3. Pollinia 4.
 - c. Flowers waxy, green; lip marked with magenta, spurred..14. Galeandra
 - c. Flowers not waxy, yellow, maroon or brown; lip usually maroon, with a mentum.....13. Eulophia
 - 3. Pollinia 8.....2. Bletia
 - a. Leaves not plicate.
 - 2. Flowers large-- at least 2.5 cm in diameter.
 - b. Lip fimbriate on edges...6. Centrogenium
 - b. Lip not fimbriate on edges.
 - 3. Flowers inverted.....4. Calopogon
 - 3. Flowers not inverted.
 - c. Leaves whorled.....18. Isotria

- c. Leaves not whorled.
 - 4. Flowers 2.5 cm across..27. Pogonia
 - 4. Flowers 5 cm across....7. Oleistes
- 2. Flowers relatively small-- under 2.5 cm in diameter.
 - b. Flowers in spiral or one-sided (secund) spikes.....32. Spiranthes
 - b. Flowers not as above.
 - 3. Leaves in a basal rosette.
 - c. Flowers on widely-spreading pedicels..
 -30. Ponthieva
 - c. Flowers not as above.
 - 4. Flowers hooded...31. Prescottia
 - 4. Flowers not hooded...9. Cranichis
 - 3. Leaves not in a basal rosette.
 - c. Leaves borne singly or in pairs half-way up stem.
 - 4. Lip much larger than other segments.
 -21. Listera
 - 4. Lip not much larger than other segments.....23. Malaxis
 - c. Leaves not borne half-way up stem.
 - 4. Leaves reduced to small bract-like organs.....34. Triphora
 - 4. Leaves not as above.
 - d. Leaves solitary, basal.....
 -33. Tipularia
 - d. Leaves several, not all basal.
 - 5. Flowers in a tight spike, white with yellow-green lip.
 -37. Zeuxine
 - 5. Flowers in lax spikes.
 - e. Flowers small, white or greenish..12. Erythroides
 - e. Flowers medium-sized, green with magenta lip.....
 - ...1. Basiphyllaea

STUDIES IN FLORIDA BOTANY

7. A Note on Basiphyllaea corallicola (Small) Ames

Alex D. Hawkes

Basiphyllaea corallicola (Small) Ames Sched. Orch. 7 (19-24) 1.

In 1910 Dr. John K. Small, student of the southeastern flora of the United States, published a new species of orchid to which he gave the name Carteria corallicola (in TORREYA 10:188). Fourteen years later in the seventh fascicle of his serial SCHEDULAE ORCHIDIANAЕ, Oakes Ames made a new combination for this plant, and had the following to say regarding its status: "As the generic name Carteria is valid for a genus of the Algae I have referred Carteria corallicola to Basiphyllaea, a genus proposed by Schlechter (in FEDDE REPERT. 17 (1921) 76) for the reception of a Cuban species formerly placed in Tetramicra."

This unusual terrestrial orchid is today one of the rarest of all our Florida indigenes. The writer has never seen it in the wild, and the few specimens available in herbaria are of notably poor quality and sparse quantity, indicative of a scarcity everywhere. It has been found in the Bahamas, but, though two other species of the small genus (B. sarcophylla (Rehb.f.) Schltr., and B. angustifolia Schltr.) are known from Cuba, our plant has not been located there as yet..

The following brief notes concerning this excessively rare orchid are made from the original description published by Small in the citation above, as no other material was available from which a more complete diagnosis could be drawn.

Basiphyllaea corallicola is a solitary-stemmed, ground-dwelling plant with thick rather slim stems attaining a height of as much as 5 dm, with a few basal leaves produced near the ground. These leaves are rather linear, somewhat curved, and attenuated at both ends. The small flowers are borne on an erect, rather inconspicuous spike and are greenish or greenish-white with a yellowish lip, which has magenta or magenta-pink lobes.

The sepals, generally green or greenish-yellow in color, measure up to 7.5 mm long and are broadly linear to linear-lanceolate in shape. The petals, more often of a greenish-white hue, are about the same size, and linear. The oval or orbicular-oval lip, up to 7 mm long, is yellowish on the disc, which has several crests extending to the base of the middle lobe, and magenta or pinkish-magenta on the lobes. A magenta anther is borne above the trilobate stigma.

In his original discussion, Dr. Small likened this plant to Triphora, and stated as follows: "Carteria is related to Triphora, but differs in the position of the flowers, and the lip, as described above, and in the short column, the prominently 3-lobed stigma which is thick and spongy at the base, and the inconspicuous anther-connective." The original habitat is given as, "In pinelands, Everglades Keys, Florida. Also in the Bahamas. Type collected about 2 miles NE of the point where the old trail crosses Long Prairie, Oct. 31, 1906., J.K. Small, J.J. Carter, A.A. Eaton."

It is hoped that subsequent collectors in southern Florida will find this intriguing little orchid again, and that its extreme rarity in herbaria will be somewhat dispelled by their gatherings. It is improbable that it will thrive under cultivation.

STUDIES IN ANTILLEAN BOTANY

2. Two Additions to the Cuban Orchid Flora

- Alex D. Hawkes -

Botanical explorations in northern Cuba in 1947 added several new records to the flora of that island. Among these novelties for Cuba were two orchids, both members of the genus Oncidium. They are discussed briefly here.

Oncidium calochilum Cogniaux in Urb. Symb. Antill. 6(1910)
660.

Previously collected in Haiti and the Dominican Republic, this dwarf yellow-flowered terete-leaved species is now known from the island of Cayo Coco, Archipelago de Camaguey, Camaguey, Cuba. On the island it inhabits large trees of Bucida Buceras L. (Combretaceae), known locally as jucaro, in the margins of saline mangrove swamps. Its epiphytic companions are largely Epidendrum spp., Polystachya luteola (Sw.) Hook., Oncidium variegatum Sw., Campylocentrum Poeppigii (Rchb.f.) Rolfe, and Cattleyopsis Ortgiesiana (Rchb.f.) Cgn.

Oncidium floridanum Ames Sched. Orch. 7 (1924) 13.

Previously considered to be restricted to a few scattered hammock areas in southern peninsular Florida, this attractive yellow and brown terrestrial species, similar in habit and general floral formation to the Oncidium sphacelatum Idl. group, is now known to be very abundant in several places on Cayo Coco, Archipelago de Camaguey, Camaguey, Cuba. It forms large prolific colonies on the humid mucky floor of the scattered hammock formations in the central and southern parts of the island. Its occurrence elsewhere, on the mainland and in adjacent insular groups, is to be anticipated.

These two additions now bring the number of Oncidiums known from Cuba to fourteen. Other indigenous members of this group are: O. altissimum (Jacq.) Sw., O. Guibertianum A. Rich., O. Gundlachii Wr., O. intermedium Bert. ex Spreng., O. Leiboldii Rchb.f., O. luridum Idl., O. pulchellum Hk., O. sphacelatum Idl., O. sylvestre Idl., O. Tuerckheimii Cgn., O. usneoides Idl., and O. variegatum Sw.

PIERREODENDRON REPLACES MANNIA (SIMAROUBACEAE)

Elbert L. Little, Jr.

The generic name Mannia Hook. f. (Simaroubaceae), universally accepted for a genus of 2 species of trees in tropical West Africa, is untenable as a later homonym of Mannia Opiz, also in use for a genus of about 10 species of thalloid liverworts of wide distribution. As names in some groups of lower plants are not systematically indexed, sometimes the same generic name is retained in two widely separated plant groups. This case was noted in a search for homonyms among genera of Hepaticae (1). The simplest way to restrict future usage of the name Mannia to the Hepaticae is to adopt for the genus of Simaroubaceae the next oldest name, Pierreodendron Engler. Accordingly, the two necessary specific transfers are made here.

PIERREODENDRON Engler, Bot. Jahrb. 39: 575. 1907.

Mannia Hook. f. in Benth. & Hook. f., Gen. Pl. 1: 309. 1862.

Non Mannia Opiz apud Corda in Opiz, Beitr. Naturgesch.

12: 646. 1829. (Hepaticae, Rebouliaceae.) Non Mannia

Trevis., Padova Accad. Sci. Riv. Period. Lav. 5: 77. 1857.

(Lichenes, Ascolichenes, Buelliaceae.)

Simarubopsis Engler, Bot. Jahrb. 46: 278. 1911.

PIERREODENDRON AFRICANUM (Hook. f.) Little, comb. nov.

Mannia africana Hook. f. in Benth. & Hook. f., Gen. Pl. 1: 309. 1862.

Pierreodendron grandifolium Engler, Bot. Jahrb. 39: 576. 1907.

This species, the type, is described as a slender tree 10 to 12 meters tall of west tropical Africa in Cameroons, French Equatorial Africa, Congo, southern Nigeria, and Ivory Coast. Dalziel (Useful Pl. West Trop. Africa 314. 1937) listed several native common names in Ivory Coast and southern Nigeria.

PIERREODENDRON KERSTINGII (Engler) Little, comb. nov.

Simarubopsis kerstingii Engler, Bot. Jahrb. 46: 280, fig. 1. 1911.

Mannia simarubopsis Pellegrin, Soc. Bot. de France Bul. 77: 665. 1930.

Mannia kerstingii (Engler) Harms apud Engler in Engler & Prantl, Natürl. Pflanzenfam., Ed. 2, 19a: 371, fig. 168. 1931.

A tall tree of Togo and Ivory Coast. Pellegrin recorded the common name "bléndodiro," and Aubréville (Fl. Forest. Côte d'Ivoire 2: 102, pl. 168. 1936) listed also "dianangboué."

Mannia Hook. f. was properly used under the International Rules of Botanical Nomenclature previous to 1930, when the homonym rule was changed to reject all later homonyms (Art. 60 (3), 61). The older name Mannia Opiz was not revived until 1934.

The hepatic genus Mannia Opiz formerly was known as Grimaldia Raddi (Bologna Opusc. Sci. 2: 356. 1818). In 1934 Wheeler (Bryologist 37: 87-88. 1934) observed that Grimaldia Raddi was untenable because of Grimaldia Schrank (Bot. Zeit. Regensb. 4: 184. 1805; Leguminosae), which also had been revived by Britton and Rose (No. Amer. Flora 23: 299-301. 1930) as a segregate genus from Cassia L. with nine North American species. Accordingly, Wheeler adopted Mannia Opiz, which originally had been proposed as a substitute name for Grimaldia because of Schrank's earlier homonym. Published in the same article with Mannia Opiz was another name, Sindonisce Corda (in Opiz, Beitr. Naturgesch. 12: 648. 1829), which might have been adopted instead, as permitted by Art. 56. Frye and Clark (Hepat. No. Amer. 60-68. 1937), Buch, Evans, and Verdoorn (Ann. Bryologici 10: 8. 1938), Evans (Chron. Bot. 4: 223-225. 1938), Little (Bryologist 42: 26. 1939), and students of Hepaticae in general have accepted Mannia Opiz.

Mannia Trevis., which also has priority over Mannia Hook. f., consisted only of the two original species of lichens transferred from Lecidea Ach. and was not adopted by later authors. Zahlbruckner (in Engler & Prantl, Natürl. Pflanzenfam. 1 (1*): 230. 1907; Ed. 2, 8: 254. 1926; Cat. Lichen. Univ. 7: 452. 1931) listed Mannia Trevis. as a synonym of Buellia De Not.

There is also an older, almost identical name, Manna D. Don (Prodr. Fl. Nepal. 246. 1825), apparently not an orthographic variant of Mannia but derived instead from the common name manna. It is a synonym of Alhagi Adans. (1763; Leguminosae).

Mannia Hook. f. was monotypic until a second species was transferred to it in 1930 and scarcely is eligible for conservation. This name was adopted by Bentham and Hooker (in whose work it was published as a monotypic genus), by Index Kewensis, by Engler (in Engler & Prantl, Natürl. Pflanzenfam. 3 (4): 209. 1896) in the separate subtribe Manniinae Engler, by Dalla Torre and Harms, and by Harms (apud Engler in Engler & Prantl, Natürl. Pflanzenfam., Ed. 2, 19a: 369-371. 1931). There are two later generic names, as each of the two species was described independently as the type of a monotypic genus and afterwards united with Mannia.

Pierreodendron grandifolium Engler, the type species, was reduced to synonymy under Mannia africana by Engler himself (Bot. Jahrb. 46: 278. 1911) at the time he described the related

species Simarubopsis kerstingii, also in a monotypic genus. As indicated above, both Pellegrin and Harms placed the latter as a second species of Mannia Hook. f. Harms also reproduced the original plate (loc. cit., p. 371, fig. 168) of the second species (Bot. Jahrb. 46: 280, fig. 1. 1911). A third species, from Ivory Coast, was first described from specimens without flowers and provisionally named Mannia (?) zaizou Aubrév. (Fl. Forest. Côte d'Ivoire 2: 104. 1936). It was later excluded from this genus and placed in a new monotypic genus, Gymnostemon Aubrév. & Pellegr. (Soc. Bot. de France Bul. 84: 183. 1937), in a different tribe of Simaroubaceae, as G. zaizou (Aubrév.) Aubrév. & Pellegr. (loc. cit., p. 184, fig. 1).

Incidentally, Pierreodendron Engler also has a later homonym, Pierreodendron A. Cheval. (Vég. Ut. Agr. Trop. Franç. 9: 257. 1917). This genus of Sapotaceae has a single species, P. durissimum A. Cheval. (loc. cit., p. 258, pl. 27) in French Equatorial Africa and is without a legitimate name. Both genera of trees were dedicated to (Jean Baptiste) Louis Pierre (1833-1905), director of the botanical garden at Saigon, French Indochina. He was author of Flore Forestière de la Cochinchine and of articles on African plants and Sapotaceae.

Forest Service,
United States Department of Agriculture,
Washington, D. C.

(1) Little, Elbert L., Jr. Nomina conservanda proposals in Hepaticae. Bryologist 52: 1-22. 1949.

A NEW SPECIES OF CHRYSOPHYLLUM FROM TRINIDAD

Joseph V. Monachino

In the course of my studies in Ecclinusa it has been necessary to digress repeatedly into other genera of the Sapotaceae. Most intimately involved with Ecclinusa is the genus Chrysophyllum. It was in April of the current year, during my quest of the actual nativity of the so-called Ecclinusa Grisebachii Pierre, reputedly native to Trinidad, but known only from the original collection, that I addressed a query to the Conservator of Forests of that British isle. In turn, I was directed to one of the outstanding students of Trinidad, Dr. Beard, formerly of the Forest Department. Dr. Beard, although now located in Africa and busy with his own work, generously gave my problem painstaking attention. He suggested that I examine a collection of his distributed as Pouteria in the Arnold Arboretum, a collection from a sapotaceous tree known as "Valencia redbark" and "wild kaimit" in Trinidad and which, notwithstanding its typical appearance, had eluded botanical identification and might possibly be, he guessed, a recently collected representative of Pierre's original species.

Obviously Beard's specimen was not Ecclinusa Grisebachii, but no more a Pouteria than Pierre's species is an Ecclinusa. It fell within my concept of the genus Chrysophyllum, of which it appeared to be an unpublished species. Unfortunately the flowering material consisted only of young buds, consequently inadequate for good description.

My interest aroused in Dr. Beard's sapot, I requested additional botanical specimens from the Conservator. Notwithstanding the sketchy allusion I made to the undescribed tree, Mr. R. S. Ayliffe, on a visit to the New York Botanical Garden undertaken for the purpose of studying the Loranthaceae of Trinidad, handed to me personally such ample flowering material, that the only important matter left to be desired is the fruit with ripe seeds.

As Mr. Ayliffe informed me that duplicates of his collection had been forwarded to Kew, I wrote to N. Y. Sandwith, who, by return mail, encouraged me to study and describe the new Chrysophyllum.

It is an unusual pleasure to contemplate the cooperation had from Dr. Beard, Mr. Ayliffe, Mr. Sandwith, and other scientists of good will, who graciously expend their energies and time in a pure simple effort to aid botanical research.

CHRYSOPHYLLUM BEARDII Monachino, sp. nov.

Arbor; petiolis 0.8--1.5 cm. longis; laminis foliorum obovatis 5--13 cm. longis, 3--6.5 cm. latis, ad apicem plerumque e-marginatis, ad basin obtusis vel subacutis, subtus brunneis vel griseis sericeo-tomentosis; venis lateralibus arcuatis 7--13-jugis, inter se plerumque 0.8--1.4 cm. diversis, supra subim-

pressis; reticulo venularum supra subimpressis, subtus subelevatis; inflorescentiis glomeratis; pedicellis ca. 2 mm. longis; sepalis ovatis 1.6--1.9 mm. longis, extus tomentosis, intus glabris; tubo corollae ca. 1.3 mm. longo, lobis ca. 2.8 mm. longis, extus pubescentibus; filamentis ca. 1.8 mm. longis; ovario tomentoso; stylo ca. 1.5 mm. longo, ad apicem conico.

Large tree with reddish flaky bark; branchlets rather slender, the young parts dark-brown tomentose; leaves sometimes subopposite, the petioles 0.8--1.5 cm. long, the blades subcoriaceous, broadly obovate (individual ones rarely elliptic), 5--13 [--15] cm. long, 3--6.5 cm. broad, emarginate or rarely rounded at apex, obtuse to subcuneate at base, the margins somewhat inrolled, the upper side dull olive-green and glabrous at maturity (except for the sparsely hairy channel of the midrib), the under side dark-brown to fulvous sericeous-tomentose or becoming gray, the hairs malpighious, mostly appressed, eventually deciduous, the lateral nerves arcuate, 7--13 pairs, with an average distance apart of 0.8--1.4 cm. (individual distances 0.4--1.5 cm.), running to the margins, slightly impressed on the upper surface of the leaf, the different branches in the nervature between the laterals of almost uniform strength, obscure, upon magnification seen faintly raised beneath and slightly impressed above; flowers numerous, glomerate, the pedicels about 2 mm. long (that of a young fruit 5 mm. long), dark-brown tomentose with appressed hairs, the sepals 5, broadly ovate, 1.6--1.9 mm. long, obtuse at the apex, appressed-tomentose outside, glabrous inside, the corolla open-campanulate, about 6 mm. across, appressed-pubescent mostly on the lobes outside, glabrous inside, the corolla-tube about 1.3 mm. long, thickened toward the throat, the corolla-lobes 5 (sometimes 4), spreading at maturity, ovate-lanceolate, about 2.8 mm. long, 1.8 mm. wide, obtuse at the apex, the filaments inserted slightly above the base of the corolla-lobes, slender, about 1.8 mm. long, attenuate toward the apex which is very fine, sharply inflexed near the apex in bud, the anthers extrorse in bud, becoming inverted and introrse at maturity, ovate and apiculate at the apex, entire length about 1 mm. long, glabrous; pistil about 2 mm. long, the ovary densely tomentose, 5-celled and 5-ovulate (sometimes 4-merous), the ovules axile near the summit of the cell, the style about 1.5 mm. long, conical at apex, the stigmatic lobes obscure; young fruit dark-brown tomentose.

Type: R. S. Ayliffe s.n. [Monachino 526], Trinidad, British West Indies, Long Stretch Reserve, along main road near Turure junction, 23 August 1949, deposited in the Britton Herbarium at the New York Botanical Garden; called "wild kaimit".

Additional specimens examined: R. S. Ayliffe s.n. [Monachino 527], Trinidad, Long Stretch Reserve, alongside of main road about one-half mile from Turure junction, 23 August 1949, in Britton Herb., N. Y. Bot. Gard. R. S. Ayliffe s.n. [Monachino 528], Trinidad, Melayo, 31 May 1949, in Britton Herb., N. Y. Bot. Gard. John S. Beard 125, Trinidad, Long Stretch Reserve, alt. 50 m., marsh and dry evergreen forests, July 1943, tree

25 m. high, trunk 1 m. diam., bark reddish, very flaky, in herb. Arnold Arboretum (two sheets of the same number, one of which, containing young fruits, bears the date April 28, 1943; the other has flower-buds only).

In a late communication Dr. Beard informs me that in August 1944 he made a second collection of "Valencia redbark", J. S. Beard 341, also deposited at the Arnold Arboretum. I have not yet examined this specimen.

Mr. Ayliffe states that the species fruits in April and May. It is in full flower in August. Dr. Beard states that it is a typical big sapotaceous tree with milky latex and very red bark. It is the tree referred to as "Valencia redbark" or "wild kaimit" in his Natural Vegetation of Trinidad and is to be found commonly in parts of the Long Stretch Reserve and also in the forest which comes down to the coast a few miles north of Balandra. He further informs me that he once showed the tree to D. B. Fanshawe, of the British Guiana Forest Service, when he visited Trinidad and Mr. Fanshawe said that it appeared to be the same as an unidentified tree he knew in a similar habitat in the N. W. District of British Guiana.

"Wild kaimit" in Beard's Natural Vegetation of Trinidad sometimes corresponds to species of Macropholis and other Chrysophyllum species as well as C. Beardii. Our plant is mentioned on page 34 where it is named "Pouteria sp. (unidentified), 'Valencia redbark' (J. S. B.)." On page 132, under the discussion of floristic composition of the Marsh Forest, "wild kaimit, Pouteria sp. (unidentified)" is noted to be a dominant tree in the upper story and that it has been recorded elsewhere in semi-evergreen seasonal forest on the east coast. In Table XXIII, Marsh Forest species attaining upper story, it is listed as second in abundance.

Only two species of Chrysophyllum, C. cainito L. and C. argenteum Jacq., were treated by A. W. Hill and W. Y. Sandwith in the Flora of Trinidad and Tobago (1947; manuscript completed in 1940). C. Beardii bears no resemblance to these. In Arthur Cronquist's revision of the South American species of Chrysophyllum (Bull. Torrey Bot. Club 73: 286--311. 1946) our novelty answers closest to C. cochlearium LeComte, a species described from French Guiana. A fragment of the type of LeComte's species borrowed from the Chicago Natural History Museum was compared with C. Beardii. The two display very close affinity, but C. cochlearium can be distinguished by its nervature which is slightly elevated on the upper surface of the leaves, the base of the blade which is narrowly decurrent on the petiole, and the darker color of the tomentum on the under side of the leaves. While the leaf-apex of our plant is prevalently emarginate in all the specimens examined, that of C. cochlearium was described as rounded or obscurely short-acuminate.

Harold N. Moldenke

ALOYSIA BRASILIENSIS Moldenke, sp. nov.

Frutex; ramis virgatis subsimplicibus valde breviterque brunneo-pubescentibus; internodiis valde abbreviatis; foliis ternatis numerosissimis ascendentibus imbricatis; petiolis 1 mm. longis vel subobsoletis dense pilosis; laminis firme chartaceis ellipticis argute acutis, ad basin rotundatis, integerrimis valde revolutis, supra scaberrimis, subtus leviter puberulis et resinoso-granulosis; inflorescentiis axillaribus.

Shrub; stems apparently virgate and almost simple, abundantly short-pubescent with brownish hairs; nodes not annulate; principal internodes much abbreviated, 5--15 mm. long; leaves ternate, very numerous, ascending, overlapping; petioles 1 mm. long or subobsolete, densely pilose; blades firmly chartaceous, rather uniformly light-green on both surfaces, elliptic, 2--3 cm. long, 6--13 mm. wide, sharply acute at the apex, rounded at the base, entire and decidedly revolute along the margins, very scabrous above, finely puberulent and resinous-granular beneath; midrib slender, deeply impressed above, very prominent and densely short-pubescent beneath; secondaries slender, 5--7 per side, spreading or slightly ascending, not arcuate, impressed above, very prominent beneath; veinlet reticulation usually obscure above, rather conspicuous beneath; inflorescence axillary, sparse, about 9 cm. long, about 1 cm. wide in anthesis, densely many-flowered; peduncles very slender, about 2 cm. long, very densely pubescent with brownish hairs; rachis elongate, slender, very densely pubescent like the peduncle; bractlets lanceolate, about 1.5 mm. long, attenuate-acute or subacuminate at the apex, densely short-pubescent; calyx irregular, about 4 mm. long, very densely spreading-hirsute at the base and to about the middle, spreading-pubescent at the apex, the teeth very unequal; corolla-tube about 4 mm. long, finely puberulent on the outer surface, the limb about 3 mm. wide, puberulent on the outer surface, 2-lipped.

The type of this species was collected by Per Karl Hjalmar Dusén somewhere in Paraná, Brazil, on January 4, 1904, and is no. 46798 in the herbarium of the Museu Nacional at Rio de Janeiro. The species is obviously related to *A. polygalaeifolia* Cham.

ERIOCAULON HUMILE Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis rosulatis linearibus membranaceis utrinque uniforme viridibus glabrisque acutis basin versus inconspicue fenestratis; vaginis arctiuscule adpressis glabris saepe conspicue tortis, ad apicem oblicue fissis; pedunculis numerosis gracillimis stramineis tricostatis valde tortis glabris; capitulis parvis griseo-stramineis hemisphaericis; bracteis involucri paucis ellipticis stramine-

is attenuato-acutis vel subacuminatis glabris nitidis.

Acaulescent herb; leaves basal, rosulate, linear, membranous, uniformly green on both surfaces, dull, 2--4 cm. long, about 1 mm. or less wide at the mid-point, acute at the apex, somewhat inconspicuously fenestrate toward the base, glabrous on both surfaces, the venation obscure; sheaths rather close, about 1.5 cm. long, often conspicuously twisted, glabrous, obliquely split at the apex, the blade short, usually erect, subacute or blunt at the apex; peduncles numerous, 7--30 per plant, very slender, stramineous, 3--13.5 cm. long, 3-costate, much twisted, glabrous; heads small, grayish-stramineous, hemispheric, 2--3 mm. in diameter; involucrel bractlets rather few, elliptic, stramineous, about 2 mm. long and 0.7 mm. wide, attenuate-acute or subacuminate at the apex, glabrous and shiny; receptacle long-villous; receptacular bractlets obovate, whitish-subhyaline, about 1.4 mm. long and 0.5 mm. wide, concave-cucullate, abruptly subacuminate at the apex, glabrous; staminate florets: sepals 2, oblanceolate, hyaline, about 0.8 mm. long and 0.2 mm. wide, abruptly short-acuminate at the apex, glabrous; petal-tube about 0.7 mm. long, very slender; stamens 4; anthers brown, small; pistillate florets: sepals 3, free, hyaline, oblanceolate, about 1.3 mm. long and 0.4 mm. wide, sharply acute at the apex, pilose on the back toward the apex; petals 3, free, hyaline, narrowly oblong, about 1.5 mm. long and 0.4 mm. wide, sharply attenuate-acute at the apex, sparsely pilose on the upper half of the back; ovary subglobose, about 0.5 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate; style about 0.4 mm. long, glabrous; stigmas 3, about 0.4 mm. long.

The type of this little species was collected by Blatter, Hallberg, and McCann (no. 28009, in part) at Khandala, Bombay, India, in October, 1918, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON INDICUM Moldenke, sp. nov.

Herba acaulescens; foliis parvis paucis vel nullis grainoideis rectis tenuiter membranaceis multinerviatis utrinque viridibus glabrisque non fenestratis; vaginis per laxis foliaceis conspicuis viridibus tenuiter membranaceis glabris, usque ad $3/4$ longitudinis fissis, lamina rectis foliaceis glabris acutis vel attenuato-acuminatis; pedunculis numerosis tricostatis in siccitate complanatis paulo tortis glabris; capitulis conicis griseis; bracteolis numerosissimis perconspicuis atrobrunneis angulato-obovatis carinatis umbonaticucullatis apiculatis extus supra mediam farinosis.

Acaulescent herb; leaves basal, apparently very few or even absent, grass-like, uniformly bright-green on both surfaces, erect, thin-membranous, 13--14 cm. long, many-nerved, not plainly fenestrate, acute at the apex, glabrous on both surfaces; sheaths very lax, foliaceous and conspicuous, 10--13 cm. long, thin-membranous, glabrous, obliquely split at about $3/4$ of its length and prolonged into an erect, foliaceous, acute or attenuate-acuminate, glabrous blade; peduncles 12 or

more per plant, 10--14 cm. long, 3-costate, flattened in drying, very slightly twisted, glabrous; heads conic, gray, 5--8 mm. long and wide; involucreal bractlets similar to the receptacular ones but slightly broader and blunter; receptacular bractlets very numerous and conspicuous, dark-brown (except at the base), angular-obovate, about 1.9 mm. long and 1.7 mm. wide, keeled transversely at the widest part and slightly umbonate on the back, cucullate, apiculate at the apex, farinose above the keel on the back, otherwise glabrous; staminate florets: sepals 3, free, oblanceolate, brownish, about 1.5 mm. long and 0.4 mm. wide, obtuse at the apex, very minutely ciliate at the apex; petals 3, united into a stramineous membranous tube about 1.3 mm. long, 3-lobed at the apex, the lobes narrow-attenuate, hyaline, with a black gland below the apex and a small erect tuft of hair at the apex; stamens 6; pistillate florets: sepals 3, filiform, free, hyaline, about 1.3 mm. long, glabrous; petals 3, free, filiform, hyaline, about 1.3 mm. long, densely long-villous from near the base to the apex; pistil 1.7--2 mm. long, glabrous; ovary 3-celled, 3-sulcate, 3-ovulate, glabrous.

The type of this very distinct species was collected by H. Santapau (no. 2924) at Khandala, on the Kuve Plateau, Bombay, India, on October 4, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON LANCEOLATUM var. *PILOSUM* Moldenke, var. nov.

Haecc varietas a forma typica speciei pedunculis dense patentibus pilosis vel villosis recedit.

This variety differs from the typical form of the species in having the peduncles densely spreading-pilose or villous.

The type was collected by H. Santapau (no. 2182) in rock pools at Khandala, Bombay, India, on September 5, 1941, and is deposited in the herbarium of St. Xavier's College at Fort, Bombay.

ERIOCAULON MEIKLEI Moldenke, sp. nov.

Herba acaulescens; foliis basalibus rosulatis graminoidis membranaceis multinerviis fenestratis subacutis utrinque glabris viridibusque; vaginis arctiuscule adpressis non tortis indistincte nervosis praeter basin glabris oblique fissis; pedunculis filiformibus 5 vel 6 stramineis tricostatis paulo tortis glabris; capitulis parvis stramineis hemisphaericis paucifloris; bracteolis involucri paucis stramineis ellipticis acutis nitidis glabris.

Acaulescent herb; leaves basal, rosulate, about 2 cm. long, grass-like, uniformly bright-green on both surfaces, membranous, many-nerved, fenestrate, subacute at the apex, glabrous on both surfaces; sheaths rather close, 1--1.5 cm. long, not twisted, indistinctly nerved, glabrous except for the slightly pilosulous or puberulous base, obliquely split at the apex, the blade very short, erect, appressed; peduncles filiform, 5 or 6 per plant, 2--6 cm. long, stramineous, 3-costate, slightly twisted, glabrous; heads small, stramineous, hemispheric,

2--4.5 mm. wide, few-flowered; involucre bractlets few, stramineous, shiny, elliptic, about 2.5 mm. long and 1 mm. wide, acute at the apex, glabrous; receptacle rather densely long-villous; receptacular bractlets dark-brown, broadly elliptic, about 3 mm. long and 1 mm. wide, narrowed to the base, long attenuate-acuminate at the apex, glabrous; staminate florets: sepals 3, brown, lanceolate, about 1.3 mm. long and 0.4 mm. wide, regularly narrowed to the base and apex, glabrous; corolla white, too immature for accurate description; pistillate florets not seen.

The type of this diminutive species was collected by Th. Monod (no. 3) at Vallon du Balasoko, Parc Institut Francaise d'Afrique Noire, Bamako-Loulouba, Senegal, Africa, on December 9, 1948, and is deposited in the herb. of the Mus. Nat. d'Hist. Naturelle at Paris. It was examined at Kew by R. D. Meikle -- in whose honor it is named -- who reports "Eriocaulon sp., not matched". It is hoped that more mature material may soon become available so that the description may be completed.

ERIOCAULON MONODII Moldenke, sp. nov.

Acaulescent herb; leaves basal, rather few, rosulate, grass-like, erect or ascending, membranous, bright-green above, slightly lighter beneath, 3.5--6.5 cm. long, 3--4 mm. wide at the mid-point, acute or subacute at the apex, inconspicuously fenestrate toward the base, glabrous on both surfaces; sheaths rather lax, 2.5--3 cm. long, not twisted, glabrous, inconspicuously veined, obliquely split at the apex, the blade short, erect, blunt or acute; peduncles very slender, numerous, 12 or more per plant, stramineous, 6--14 cm. long, 4-costate, hardly at all or very slightly twisted, glabrous; heads whitish, hemispheric, 4--7 mm. wide; involucre bractlets few, stramineous, elliptic, about 2.5 mm. long and 1 mm. wide, acute at the apex, glabrous and shiny; receptacle densely long-villous; receptacular bractlets numerous, conspicuous, black (except the very base), obovate, more or less concave-cucullate, about 2 mm. long and 0.9 mm. wide, abruptly short-acuminate at the apex, short-pilose with white hairs toward the apex on the back; staminate florets: sepals 3, dark-brown, free, obovate, about 1.5 mm. long and 0.4 mm. wide, rounded and often erose at the apex, glabrous; petals 3, united into a very slender white tube about 1 mm. long, the 3 lobes divergent and about 0.6 mm. long; stamens 6; anthers small, light-brown; pistillate florets: sepals 3, free, brown, narrow-elliptic or oblong, about 1.2 mm. long and 0.4 mm. wide, subacute at the apex, glabrous except for a very few short whitish hairs at the very apex on the back; petals 3, free, hyaline, oblong-oblancheolate, about 1.7 mm. long and 0.3 mm. wide, obtuse at the apex, glabrous except for the slightly white-pilose apex; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-celled, 3-sulcate, 3-ovulate; style white, about 0.8 mm. long, glabrous; stigmas 3, about 0.2 mm. long.

The type of this species was collected by Th. Monod (no. 1) -- in whose honor it is named -- at Vallon du Balasoko, Parc -

Institut Francaise d'Afrique Noir, Bamako-Koulouba, Senegal, Africa, on December 9, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was kindly examined by R. D. Meikle at Kew, who reports that it is an "Eriocaulon sp. near E. Afzelianum Wikstr. ex Koernicke, but capitula larger, florets smaller, petals subequal."

ERIOCAULON PARANENSE Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis graminoides multinervis utrinque atroviridibus glabratisque, basin versus fenestratis, ad apicem obtusis et tubuloso-cucullatis; vaginis per laxis elongatis multistriatis paulo tortis glabris, ad apicem fissis bifidis; pedunculis ca. 5 crassiusculis rigidis 9-costatis tortis glabris; capitulis hemisphaericis albidis; bracteis involucri fuscis valde concavis ellipticis firmis acutis glabris; receptaculo longe villosa.

Acaulescent herb; leaves basal, rosulate, grass-like, uniformly dark-green on both surfaces, 3--5 cm. long, about 4 mm. wide at the mid-point, many-nerved, fenestrate toward the base, glabrate on both surfaces, dull, obtuse and often tubular-cucullate at the apex in pore-like fashion; sheaths far surpassing the leaves, very lax, 10--12 cm. long, many-striate, slightly twisted, glabrous, obliquely bifid and split at the apex; peduncles about 5 per plant, rather stout, stiff, 42--65 cm. long, 9-angled, glabrous, twisted; heads hemispheric, about 1.5 cm. in diameter, whitish; involucre bractlets dark-brown, pronouncedly concave, elliptic, firm-textured, about 3.5 mm. long and 2 mm. wide, acute at the apex, glabrous; receptacle long-villous; receptacular bractlets obovate, concave-arched, about 3.5 mm. long and 1.5 mm. wide, brown, long-acuminate at the apex, cuneate-narrowed to the base, very minutely ciliolate-margined, otherwise glabrous; staminate florets: sepals 3, free, brownish, oblong-obovate, cucullate-concave, about 1.7 mm. long and 0.8 mm. wide, glabrous except for the densely white-barbellate apex; petals 3, free, linear, white, very unequal, one about 1.9 mm. long and very densely villous in barbellate fashion from near the base to the apex, the other 2 only 0.8 mm. long and sparsely short-barbellate at the apex only; stamens 6; anthers dark-brown or black; pistillate florets: sepals 3, subhyaline, narrowly oblong, about 2.1 mm. long and 0.4 mm. wide, free, two glabrous, the third barbellate at the apex; petals 3, about 1.3 mm. long and 0.4 mm. wide, densely villous on the back and barbellate at the apex; pistil apparently rudimentary.

The type of this species was collected by Günter Tessmann (no. 2751) in wet places at Florestal, 29 km. east of Curitiba, on the road from Curitiba to Paranaguá, at an altitude of 930 m., Paraná, Brazil, on December 13, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON SANTAPAU Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis graminoides membranaceis acutis utrinque glabris indistincte multinervis non fen-

estratis; vaginis laxiusculis viridibus glabris non tortis, indistincte nervatis, ad apicem oblique fissis; pedunculis mucrosissimis gracilibus stramineis 4-costatis glabris; capitulis parvis stramineis hemisphaericis; bracteolis involucri paucis ellipticis stramineis obtusis glabris.

Acaulescent herb; leaves basal, rosulate, grass-like, membranous, about 4 cm. long, about 3 mm. wide at the mid-point, acute at the apex, not fenestrate, glabrous on both surfaces, indistinctly many-nerved; sheaths rather lax, green, 1.8--2.8 cm. long, not twisted, glabrous, indistinctly nerved, obliquely split at the apex, the blade short, blunt; peduncles about 50 per plant, slender, stramineous, 4-costate, 8--20 cm. long, glabrous; heads small, stramineous, hemispheric, 2.5--3 mm. in diameter; involucrel bractlets few, elliptic, about 2 mm. long and 1 mm. wide, stramineous, obtuse at apex, glabrous; receptacle densely long-villous; receptacular bractlets brownish, obovate, somewhat concave-cucullate, about 1.3 mm. long and 0.6 mm. wide, rounded at the apex, finely white-pilose on the back toward the apex; staminate florets: sepals 3, stramineous, connate only at the very base, about 1 mm. long and 0.2 mm. wide, obtuse and slightly white-pilose on the back at the apex; petals 3, united into a whitish membranous tube about 1.7 mm. long, the free lobes about 0.2 mm. long; stamens 6; anthers brown; pistillate florets: sepals 3, hyaline, narrowly oblong, free, about 0.6 mm. long and 0.1 mm. wide, acute at the apex, glabrous throughout; petals 3, free, hyaline, narrowly oblong, about 0.8 mm. long and 0.1 mm. wide, subacute at the apex, glabrous; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate; style about 0.6 mm. long, glabrous; stignas 3, about 0.4 mm. long.

The type of this distinct species was collected by H. Santapau and C. McCann (no. 1290) in a stream near Kave Mission at Khandala, Bombay, India, on November 7, 1942, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is named in honor of Dr. H. Santapau in appreciation of his valued interest in this and other groups of Bombay plants and his kind cooperation with the writer's researches.

JUNELLIA ALATOCARPA (Troncoso) Moldenke, comb. nov.

Verbena alatocarpa Troncoso, Darwiniana 8: 485. 1949.

JUNELLIA TETRAGONOCALYX (Troncoso) Moldenke, comb. nov.

Verbena tetragonocalyx Troncoso, Darwiniana 8: 481--485. 1949.

LANTANA CORDATIBRACTEATA Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus obtuse tetragonis strigillosis; nodis subannulatis; intermediis abbreviatis; foliis oppositis; petiolis 1--3 mm. longis vel obsoletis densiuscule strigilloso-puberulis submarginatis; laminis chartaceis ovatis acutis, ad basin abrupte acuminatis, regulariter serrulatis (dentibus adpressis rotundatis revolutis), supra minute strigillosis scabridisque, subtus dense tomentellis.

Shrub; branches and branchlets apparently slender, obtusely tetragonal, very finely strigillose, more densely so on the youngest parts; nodes somewhat annulate; principal internodes apparently abbreviated, 0.5--2 cm. long; leaves decussate-opposite; petioles very slender, 1--3 mm. long or obsolete, rather densely strigillose-puberulent, slightly margined, flattened or subcanaliculate above; blades chartaceous, grayish-green above, much lighter beneath and often decidedly grayish there, ovate, 1.5--2.5 cm. long, 1--1.4 cm. wide, acute at apex, abruptly acuminate at the base, shallowly but regularly serrulate along the margins with appressed and rounded revolute margined teeth, microscopically strigillose and scabridous above, densely matted-puberulent or tomentellous with grayish hairs beneath; midrib very slender, slightly impressed above, prominent beneath; secondaries very slender, 3--5 per side, ascending, hardly at all arcuate, subimpressed above, prominent beneath; veinlet reticulation fine, abundant, subimpressed above, mostly obscured by the dense pubescence beneath; inflorescence axillary, in opposite pairs, approximately equaling the subtending leaves, 2--2.5 cm. long, erect-ascending; peduncles very slender, 14--18 mm. long, very finely strigillose; heads small, hemispheric, 1 cm. or less long and wide, many-flowered; bracts conspicuous, ovate, the outermost to 6 mm. long and 5 mm. wide, acute at the apex, cordate at the base, finely puberulent on both surfaces with appressed grayish hairs, venose; corolla-tube very slender, about 5 mm. long, densely puberulent on the outer surface, its limb about 3 mm. wide, densely puberulent on the outer surface.

The type of this species was collected by A. J. de Sampaio (no. 8204) at Campos along the side of the road from Atafona, Rio de Janeiro, Brazil, and is no. 46757 in the Herbarium of the Museu Nacional at Rio de Janeiro.

LIPPIA MULTIFLORA Moldenke, sp. nov.

Frutex; caulibus ramisque crassiusculis obtuse tetragonis parce adpresso-strigillosis plusminusve granulosis, saepe purpurascensibus canaliculatisque, non scabris; foliis plerumque ternatis; petiolis gracilibus adpresso-strigillosis granulosis plusminusve marginatis; laminis firme chartaceis rectis anguste ellipticis griseo-viridibus ad basin apicemque attenuato-acutis regulariter serrulatis, supra strigillosis non scabris vel minutissime scabrellis, subtus dense puberulis et resinoso-granulosis; inflorescentiis paniculato-aggregatis.

Shrub; stems and branches medium-slender or rather stoutish, obtusely tetragonal, sparsely appressed-strigillose and more or less granulose, not at all scabrous, often purplish, often canaliculate; nodes distinctly annulate; leaves whorled, mostly ternate; petioles slender, 2--5 mm. long, appressed-strigillose and granulose, more or less margined; blades firmly chartaceous, rather thick-textured and stiff, mostly erect, narrow-elliptic, 5.5--13 cm. long, 1--3.3 cm. wide, rather grayish-green, lighter beneath, attenuate-acute at both ends, uniformly serrulate from below the middle to the apex, strig-

illose on the upper surface with bulbous-based hairs but not at all or but very obscurely scabellous, densely puberulent and resinous-granulose beneath; midrib slender, plane or very slightly impressed above, prominent beneath; secondaries very slender, 10 or more per side, plane or very slightly impressed above, prominulous beneath, ascending, slightly arcuate, terminating in the sinuses between the marginal teeth; vein and veinlet reticulation abundant, regular, occasionally slightly subimpressed above, subprominulous beneath; inflorescence aggregated at the tips of the stems and branches in paniculate fashion, often to 20 cm. long and 10 cm. wide; peduncles similar to the upper part of the stems or branches and continuous with them, similar in texture and pubescence, about 8 cm. long; inflorescence-branches slender, 2--8 cm. long, the lower ones longest and usually ternate in the axils of foliaceous bracts that are 2--3 cm. long and similar to the leaves in all other characters, the upper irregularly clustered in the axils of smaller and narrower bracts; spikes subcapitate in anthesis, becoming cylindrical-oblong and to 2 cm. long, congested on densely appressed-pubescent stalks 3--10 mm. long, densely many-flowered; lowermost bractlets broadly ovate, about 3 mm. long and 2 mm. wide, the upper ones obovate and somewhat smaller, all densely imbricate, short-acuminate at the apex, densely white-villosulous with appressed antrorse hairs on the back; flowers very small, the calyx densely spreading-hirsutulous, the corolla with an infundibular tube about 2 mm. long, very slender at the base, ampliate to 1 mm. at the apex, the slender portion glabrous, the expanded portion strigillose on the outer surface, the limb irregularly 2-lipped, the upper lip erect, about 1 mm. long, the lower lip 3-lobed, the lobes about 0.5 mm. long, ovate.

The type of this apparently widespread species was collected by Charles Barter (no. 768), probably in Northern Nigeria, while on Dr. Baikie's Niger Expedition between 1857 and 1859, and is deposited in the Torrey Herbarium at the New York Botanical Garden. I am indebted to my colleague, R. D. Meikle, of Kew, for pointing out to me the differences between this species and L. rugosa A. Chev., with which it had previously been confused by me.

PAEPALANTHUS TESSMANNII Moldenke, sp. nov.

Herba; caule valde abbreviatio; foliis plusminusve rosulatis graminoideis acutis multinerviatis utrinque glabris non fenestratis; vaginis elongatis subadpressis glabris apicem versus ampliatis et oblique fissis; pedunculis ca. 6 gracilibus 5-costatis complanatis tortis glabris; capitulis subglobosis albis; bracteolis involucri brunneis oblongo-oblancoelatis acutis ciliato-marginatis; receptaculo dense longue villosulo.

Herb; stems greatly abbreviated, 2--3 cm. long; leaves more or less rosulate, grass-like, uniformly bright-green and shiny on both surfaces, mostly 4--6 cm. long, 6--7 mm. wide at the mid-point, acute at apex, many-nerved, not fenestrate, glabrous on both surfaces; sheaths surpassing the leaves, about 7 cm.

long, rather close, more ampliate and obliquely split above, glabrous; peduncles about 6 per plant, slender, 32--50 cm. tall, 5-costate, flattened in drying, twisted, glabrous; heads subglobose, white, 7--8 mm. in diameter; involucrel bractlets brownish, oblong-ob lanceolate, about 3 mm. long and 1 mm. wide, acute at the apex, irregularly ciliate-margined, otherwise glabrous; receptacle densely long-villous; receptacular bractlets stramineous, narrowly oblong-spatulate, about 2.2 mm. long and 0.4 mm. wide, glabrous except for the dense tuft of erect white hairs at the apex; staminate florets: sepals 3, white, obovate, connate only at the base, the free portion about 1.7 mm. long and 0.4 mm. wide, glabrous except for the densely barbellate apex; petals united into a slender membranous brownish tube about 0.8 mm. long, 3-lobed at the apex; stamens 3, exerted from the corolla; filaments about 0.2 mm. long, white; anthers oblong, yellow; pistillate florets: sepals 3, whitish, oblan- ceolate-spatulate, connate only at the very base, about 2.1 mm. long and 0.5 mm. wide, obtuse at the apex, glabrous except for the densely barbellate apex; petals 3, free, subhvaline, obovate-spatulate, about 1.3 mm. long and 0.4 mm. wide, long-villous from the middle to the apex on the back; ovary 3-cell- ed, 3-sulcate, 3-ovulate, glabrous, about 0.4 mm. long and wide; style glabrous, about 0.6 mm. long, its 3 appendages a- bout 0.8 mm. long; stigmas 3, about 0.8 mm. long.

The type of this species was collected by Günter Tessmann (no. 3781) -- in whose honor it is named -- in wet places be- tween tufts of grass on the campo at Piraquara, about 22 km. east of Curitiba, Paraná, Brazil, on January 15, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden.

PAEPALANTHUS VIGIENSIS Moldenke, sp. nov.

Herba caulescens; caulibus gracilibus rectis foliosis ad a- picum longe villosis; foliis linearibus firmis obtusis, in sta- tu senectate glabrescentibus, in statu juventute plusminusve longe pilosis, supra subcanaliculatis, non fenestratis; vagin- is arcte adpressis glabrescentibus, ad apicem oblique fissis et longe villosis; pedunculis filiformibus 5 vel 6 bicostatis stramineis plusminusve pilosis vel glabrescentibus tortis; capitulis hemisphaericis vel subglobois; bracteolis involucri brunneis firmis late elliptico-obovatis glabris acutis vel rotundatis; receptaculo dense longeque villosio.

Caulescent herb; stems slender, to 4 cm. long, erect, leafy, long-villous at the summit; leaves linear, rather firm, 6--8 mm. long, less than 1 mm. wide at the mid-point, blunt at the apex, more or less long-pilose when young, glabrescent in age, uniformly green on both surfaces, slightly canaliculate on the upper surface, not fenestrate; sheaths closely appressed, a- bout 1 cm. long, glabrescent except for the obliquely split long-villous apex, the blade short, ascending, about 2 mm. long; peduncles filiform, 5 or 6 per stem, borne at the apex of the stem, 2-costate, more or less pilose or glabrescent, stramineous, twisted; heads hemispheric or subglobose, about 3

mm. in diameter; involucrel bractlets brownish, firm, broadly elliptic-ovate, about 1.3 mm. long and 0.8 mm. wide, acute or rounded at the apex, glabrous; receptacle densely long-villous; receptacular bractlets oblong, stramineous, about 1 mm. long, acute at the apex, tufted-villous at the apex; staminate florets: sepals 3, connate only at the very base, brown, obovate, about 0.8 mm. long and 0.4 mm. wide, rounded at the apex, glabrous except for a very few short hairs at the very apex; petals 3, united into a brownish membranous tube about 0.8 mm. long, glabrous; stamens 3; pistillate florets not seen.

The type of this species was collected by J. Murça Pires (no. 1398) on the campina at Vigia, Pará, Brazil, on November 17, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. Although the major part of an entire head of flowers was dissected, no pistillate florets were discovered.

PAEPALANTHUS VILLIPES Moldenke, sp. nov.

Herba caulescens saepe multiramosa; caulibus gracilibus ubique foliosis densiuscule longeque villosis; ramis plerumque brevibus dense foliosis et longe villosis; foliis linearibus plerumque recurvatis, ad basin ampliatio-amplectontibus, ad apicem obtusis, supra canaliculatis, basin versus multinerviatis, non fenestratis, in statu juventute plusminusve villosis, in statu senectute glabris, basin versus ciliato-marginatis; vaginis arcte adpressis ubique laxe villosis, ad apicem oblique fissis; pedunculis filiformibus stramineis 2-costatis basin versus densissime albido-villosis, apicem versus glabrescentibus paulo tortis; capitulis hemisphaericis griseo-albidis; bracteolis involucri atrobrownis rhomboideis glabris breviter acuminatis; receptaculo dense longeque villoso.

Caulescent often many-branched herb; stems slender, 5--6 cm. long, often bearing a whorl of branches at its apex, leafy throughout, rather densely long-villous; branches mostly short, to 2 cm. long, densely leafy and long-villous; leaves linear, amplate-sheathing at the base, uniformly green on both surfaces, 1.3--2 cm. long, 1 mm. wide or less at the mid-point, usually recurved, blunt at the apex, canaliculate on the upper surface, many-nerved toward the base beneath, not fenestrate, more or less scattered-villous when young, glabrous in age, more or less villous-ciliate along the margins toward the base; sheaths closely adpressed, 1--1.2 cm. long, loosely villous throughout, obliquely split at the apex, the blade short, erect, lanceolate, acute; peduncles filiform, 3--5 or more per branch, stramineous, 5--13 cm. long, very densely villous with white, ascending, rather loose hairs on the lower half, glabrescent toward the apex, 2-costate, slightly twisted; heads hemispheric, about 4 mm. in diameter, grayish-white; involucrel bractlets dark-brown, rhomboid, about 0.9 mm. long and 0.5 mm. wide, short-acuminate at the apex, glabrous; receptacle densely long-villous; receptacular bractlets oblong-spatulate, brown, about 0.9 mm. long and 0.6 mm. wide, concave-cucullate, rounded at the apex, long-pilose on the back; staminate florets: sepals

3, brownish, broadly elliptic-obovate, concave-navicular and enfolding the rest of the floret, free except for the very base, about 0.8 mm. long and 0.5 mm. wide, subacute at the apex and there densely barbellate on the back; petals 3, united into a whitish membranous tube about 0.4 mm. long, 3-lobed at the apex; stamens 3; anthers large, yellow; pistillate florets: sepals 3, free, hyaline, oblong, about 1.5 mm. long and 0.2 mm. wide, subacute at the apex, glabrous; petals 3, free, obovate-spatulate, concave-cucullate at the apex and enveloping the pistil, subhyaline, about 1.3 mm. long and 0.3 mm. wide, rounded and densely barbellate at the apex; ovary elongate-elliptic, about 0.8 mm. long and 0.4 mm. wide, glabrous, not plainly sulcate; style stout, short, about 0.4 mm. long, glabrous; stigmas 3, about 0.2 mm. long.

The type of this species was collected by G. A. Black (no. 48-3278) in barrancas at Vigia, in the region of Campina do Palha, Pará, Brazil, on September 30, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector describes the species as a low perennial, common in barrancas. It appears to be related to *P. Jahni* Ruhl., but differs conspicuously in the pubescence of its leaves and peduncles.

PREMNA MICROPHYLLA var. **LUXURIANS** (Nakai) Moldenke, comb. nov.
Premna luxurians Nakai, Rep. Veg. Is. Sikasima Iyo 37. 1927.

PRIVA BOLIVIANA Moldenke, sp. nov.

Herba; caulibus gracilibus tetragonis sulcatis pilosis glabrescentibus multiramosis; ramis rectis vel adscendentibus gracilibus obtuse tetragonis sulcatis densiuscule uncinato-pilosis; foliis oppositis; petiolis gracillimis dense uncinato-pilosis; foliis membranaceis ovatis acutis serratis, ad basin subtruncatis vel abrupte acuminatis, supra plusminusve pilosis, subtus densiuscule puberulis et parce resinoso-glandulosis; coccis scrobiculatis glabris non armatis.

Herb, 40--80 cm. tall; stems slender, quadrangular, sulcate between the angles, pilose or glabrescent in age, abundantly branched; branches erect or ascending, slender, obtusely tetragonal, sulcate (in drying) between the angles, rather densely uncinato-pilose; nodes somewhat flattened, not conspicuously ampliate, not annulate; principal internodes 5--8 cm. long; leaves decussate-opposite; petioles very slender, 1--2 cm. long, densely uncinato-pilose; blades membranous, somewhat lighter green beneath, ovate, 3--6 cm. long, 2--4.2 cm. wide, acute at the apex, rather coarsely serrate from near the base to the apex with rounded teeth, subtruncate or abruptly acuminate at the base, more or less pilose above with hairs of various lengths (the larger ones bulbous-based), more densely puberulent and slightly resinous-glandular beneath; midrib very slender, plane above, subprominent beneath; secondaries about 5 per side, very slender, ascending, hardly arcuate, often several issuing from the base of the blade; tertiaries obscure or indiscernible above, slightly prominulous beneath; inflores-

cence axillary, elongate, racemose, 8--20 cm. long, with rather distant flowers and fruits; peduncles erect or ascending, 1--2 cm. long, acutely or obtusely tetragonal, uncinately-pilose; rachis acutely tetragonal, densely uncinately-pilose; pedicels filiform, about 1 mm. long, densely uncinately-puberulent; calyx about 2.5 mm. long, densely uncinately-puberulent and with scattered longer straight hairs on the ribs; corolla violet; cocci 3 mm. long, scrobiculate but totally unarmed, glabrous.

The type of this distinct species was collected by Ismael Peredo at Las Juntas, at an altitude of about 350 m., Santa Cruz, Bolivia, on January 29, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden.

STACHYTARPHETA FROESII Moldenke, sp. nov.

Suffrutex lignosus multiramis; ramis graciliusculis obtuse tetragonis densissime lanato-tomentosis; foliis oppositis; petiolis percrassis vel obsoletis densissime sordido-lanatis; laminis firme coriaceis obovatis, ad apicem rotundatis, ad basin cuneato-attenuatis, ultra mediam breviter dentatis revolutis, supra subbullatis, in statu juventute utrinque dense lanato-tomentosis, in statu senectute supra glabris nitidisque, subtus dense sordido-lanatis.

Woody subshrub, abundantly branched; branches rather slender and obtusely tetragonal, very densely lanate-tomentose with sordid hairs; nodes not visibly annulate; principal internodes 1--2.5 cm. long; leaves decussate-opposite, abundant near the tips of the branches; petioles very heavy and thick, to 5 mm. long or obsolete, very densely sordid-lanate; blades firmly coriaceous, dark-green and very shiny above, sordid beneath, obovate, 2--4 cm. long, 2--3.8 cm. wide, rounded at the apex, cuneately attenuate into the petiole at the base, uniformly short-dentate from the widest part to the apex with obtuse or rounded teeth, revolute-margined, subbullate in drying above, densely lanate-tomentose on both surfaces when young, becoming glabrous above in age, permanently densely sordid-lanate beneath; midrib slender, somewhat impressed above, obscured by the tomentum beneath; secondaries very slender, 5 or more per side, regular, close together and subparallel, ascending, hardly at all arcuate, somewhat impressed above (in drying), hidden by the tomentum beneath; tertiaries regular, abundant, straight, subparallel, issuing at right angles from the secondaries and connecting them, somewhat impressed above (in drying), hidden by the tomentum beneath; inflorescence apparently terminal; spikes very short and dense, apparently only 2--3 cm. long and 2 cm. wide before and during anthesis, densely lanate, sessile or subsessile; rachis, bractlets, and calyx apparently densely sordid-villous; flowers not in condition for description, but the pistil about 1 cm. long, the stigma capitate.

The type of this species was collected by R. de Lemos Fróes (no. 20140) -- in whose honor it is named -- in "campos gerais" between Sincorá and Mucugê, Bahia, Brazil, on February 19, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS BALDWINI Moldenke, sp. nov.

Herba minuta; caulibus obsoletis vel perabbreviatis ad apicem dense longeque pilosis; foliis numerosis dense rosulatis rectis linearibus fimbriatis attenuato-acutis non fenestratis, in statu juventute plusminusve sordido-pilosis et ad basin dense pilosis, in statu senectute utrinque glabrescentibus; vaginis arcte adpressis glabris, ad apicem oblique fissis; pedunculis 1--3 filiformibus 2- vel 3-costatis debilibus paulo tortis glabris; capitulis subglobosis albis; receptaculo villosa.

Tiny herb; stems obsolete or much abbreviated, densely long-pilose at the apex; leaves numerous, densely rosulate, erect, uniformly bright-green on both surfaces, linear, firm, 5--10 mm. long, about 0.5 mm. wide (or less) at the mid-point, attenuate-acute at the apex, glabrescent on both surfaces when mature, more or less sordid-pilose when young and rather densely pilose at the very base, not fenestrate, the venation indiscernible; sheaths closely appressed, about 5 mm. long, glabrous, obliquely split at the apex, the blade short, erect, appressed; peduncles 1--3 per plant, filiform, 1.5--2 cm. long, 2- or 3-costate, slightly twisted, weak, glabrous or practically so; heads subglobose, white, 3--3.5 mm. in diameter; receptacle densely long-villous; receptacular bractlets hyaline, elliptic, about 1.3 mm. long and 0.4 mm. wide, rounded at the apex, glabrous on both surfaces, slightly concave; staminate florets: sepals 3, free and separate, hyaline, oblanceolate-spatulate, about 1.3 mm. long and 0.4 mm. wide, rounded at the apex, attenuate-narrowed at the base, glabrous; petals 3, united into a pale-stramineous tube about 1 mm. long, ampliate at the apex and surmounted by 3 triangular-ovate, erect, rather firm lobes; stamens 3; pistillate florets: sepals 3, free and separate, narrow-oblong or spatulate, hyaline, about 1.3 mm. long and 0.2 mm. wide, obtuse at the apex, glabrous; petals 3, connate at the middle into a stramineous tube about 1.3 mm. long, free at the base, surmounted by 3 triangular-ovate erect lobes about 0.6 mm. long and wide, glabrous throughout; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this very diminutive species was collected by J. T. Baldwin (no. 3479) -- in whose honor it is named -- on the Rio Negro, at the mouth of the Rio Uaupés, Amazonas, Brazil, on February 24, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is apparently closely related to S. amazonicus Moldenke.

SYNGONANTHUS BELLUS Moldenke, sp. nov.

Herba caulescens; caulibus solitariis rectis densiuscule glanduloso-pubescentibus; foliis basalibus rosulatis numerosis linearibus acutis utrinque glabris; foliis caulibus brevioribus plusminusve patente pilosis erecto-adscedentibus verticillatis; inflorescentiis umbellatis terminalibus involucratis; bracteis foliaceis dense patenteque pilosis, pilis plerumque glanduliferis; vaginis dense patenteque pilosis; pedunculis dense umbellatis filiformibus dense patenteque pilosis (pilis

glanduliferis) obsolete costatis non tortis; capitulis obconicis albis; bracteolis involucri conspicuis lanceolatis vel ellipticis attenuato-acutis glabris vel parce pilosis.

Caulescent herb; stems single, erect, to 9.5 cm. tall, rather densely glandular-pubescent with more or less contorted grayish spreading hairs which become appressed-matted in age; leaves basal and cauline, the basal ones rosulate, numerous, linear, about 1 cm. long or less, about 0.3 mm. wide at the mid-point, acute at the apex, glabrous on both surfaces, not plainly canaliculate nor striate, the cauline ones similar but shorter and more or less spreading-pilose, borne in 5 or 6 whorls 6--20 mm. apart on the stem, erect-ascending; inflorescences borne in a terminal umbel subtended by an involucre of leaf-like densely spreading-pilose bracts, the hairs mostly gland-tipped; sheaths closely appressed, about 1 cm. long, densely spreading-pilose, obliquely split at the apex, the blade erect, lanceolate, 2--3 mm. long; peduncles 16--85 per umbel, radiating to form a hemispheric or almost globose umbel 4--6 cm. in diameter, filiform, 1--3 cm. long, densely spreading-pilose throughout with brownish gland-tipped hairs, obsoletely ribbed, not twisted; heads obconic, white, 2--3 mm. long and wide; outer involucreal bractlets small, lanceolate, subhyaline, about 1.5 mm. long and 0.5 mm. wide, attenuate to the sharp apex, glabrous, the inner ones large, conspicuous, elliptic, about 2.5 mm. long and 1 mm. wide, attenuate-acute at the apex, finely pilose on the back; receptacle long-villous; receptacular bractlets narrow-elliptic, hyaline, about 2 mm. long, attenuate at both ends, appressed-pilose on the back; staminate florets: sepals 3, hyaline, free, narrow-elliptic, about 1.3 mm. long, acute at the apex, long-pilose on the back; petals 3, connate into an infundibular stramineous tube, the apiculate portion about 0.8 mm. long and 1.3 mm. in diameter, firmly spreading, glabrous; stamens 3, equaling the corolla; pistillate florets: sepals 3, free, linear, hyaline, about 2 mm. long and 0.2 mm. wide, finely pilose but usually covered by equally long receptacular hairs; petals 3, connate at the middle, free at the apex and base, hyaline, about 2 mm. long, glabrous; ovary very small; style abbreviated.

The type of this distinct species was collected by J. Murga Pires (no. 1397) on the campina at Vigia, Pará, Brazil, on November 17, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS NANUS Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis graminoides membranaceis acutis glabris vel paucissimè pilosis obscure fenestatis; vaginis perlaxis rectis complanatis multicostatis dense patentèque fulvo-villosis; pedunculis ca. 5 stramineis glabris obscure costatis; capitulis albidis obconicis; bracteolis involucri aureo-stramineis pernitidis late ellipticis obtusis glabris rigidulis.

Acaulescent herb; leaves basal, rosulate, grass-like, membranous, uniformly green on both surfaces, 1.5--3 cm. long,

acute at the apex, glabrate or with a very few scattered elongate hairs, microscopically fenestrate throughout on both surfaces, 3--3.5 mm. wide at the mid-point; sheaths very lax, 3--4 cm. long, erect, straight, flattened in drying, many-ribbed, densely spreading-villous with fulvous hairs; peduncles about 5 per plant, 2--5 cm. long [when immature?], stramineous, glabrous, not plainly costate; heads whitish, obconic, 2.5--3 mm. long and wide [when immature]; involucrel bractlets stramineous with a golden tinge, very shiny, broadly elliptic, about 2.5 mm. long and 1.5 mm. wide, blunt at the apex, glabrous on both surfaces, firm-textured, rather stiff, translucent except for the conic basal portion which is opaque; flowers too immature for accurate description.

The type of this species was collected by Ceccatto (no. 118) at Palmeira, Paraná, Brazil, in December, 1936, and is no. 3230 in the herbarium of the Museo Paranaense. It is deposited in the Britton Herbarium at the New York Botanical Garden. Although the type is too immature to permit accurate description of the florets, the habitual and vegetative characters of the plant are so distinct as to leave little doubt that it represents a new species. It is to be hoped that new and better material may soon be forthcoming.

VERBENA INCISA f. **ALBIFLORA** Osten & Moldenke, f. nov.

Hæc forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by Teodoro Meyer (no. 518, in part) at Fontana, Chaco, Argentina, in October, 1931, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo.

VERBENA INTERMEDIA f. **ALBIFLORA** Moldenke, f. nov.

Hæc forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by Arturo Burkart (no. 4179) in xerophilous woods on the steppe at Gualeguaychú, Entre Ríos, Argentina, on January 5, 1932, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo.

VERBENA LILLOANA Moldenke, sp. nov.

Herba; caulibus gracilibus obtuse tetragonis sæpe canaliculatis minute pilosulis vel subglabrescentibus; foliis oppositis; petiolis gracilibus plusminusve marginatis minute pilosulis vel glabrescentibus; laminis submembranaceis ovatis plusminusve tripartitis profunde inciso-lobatis utrinque minutissime pilosulis vel glabrescentibus, lobis majoribus ad apicem dentatis; inflorescentiis terminalibus densifloris spicatis.

Herb; stems slender, obtusely tetragonal, often canaliculate between the angles, minutely pilosulous or subglabrescent; nodes obscurely annulate with a band of denser hairs; principal internodes 6.5--7 cm. long; leaves decussate-opposite, usually

with abbreviated branchlets in their axils; petioles slender, 1--2 cm. long, more or less margined, minutely pilosulous or glabrescent; blades submembranous, uniformly green on both surfaces, ovate in outline, 3--5 cm. long, 1.5--4 cm. wide, more or less tripartite, each division deeply incised-lobed, the larger lobes toothed near their apex, very minutely scattered-pilosulous on both surfaces or glabrescent; midrib and the 4 pairs of secondaries very slender, plane above, flattened beneath; veinlet reticulation very sparse and inconspicuous on both surfaces; inflorescence terminal, solitary; peduncles elongated, about 9 cm. long, minutely pilosulous with scattered short hairs or glabrescent; spikes dense-flowered except for the lowest 2 or 4 flowers which are widely separated (at least after anthesis); bractlets lanceolate, about 7 mm. long, long-attenuate at the apex, somewhat ciliate-margined, otherwise glabrate; calyx-tube about 7 mm. long, pilosulous-puberulent, surmounted by 5 unequal apiculate teeth about 2 mm. long; corolla-tube about 7 mm. long, obscurely appressed-pilosulous on the outside, the limb about 6 mm. in diameter, the larger lobes asymmetrically emarginate.

The type of this species was collected by S. Venturi (no. 4607) at Las Panas, at an altitude of 3000 m., dept. Chichigasta, Tucumán, Argentina, on November 22, 1926, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA PLATENSIS f. **VIOLACEA** Moldenke, f. nov.

Haec forma a forma typica speciei corollis violaceis recedit. This form differs from the typical form of the species in having its corollas violet in color.

The type was collected by Cornelio Osten (no. 3195) at Arroyo Grande, Tala, dept. Soriano, Uruguay, on October 3, 1895, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo.

VERBENA SCHULZII Moldenke, sp. nov.

Herba; caulibus ramisque acute tetragonis fistulosis breviter patentibus piloso-pubescentibus, pilis albidis vel sordidis; foliis oppositis sessilibus; laminis chartaceis lanceolatis acutis argute irregulariterque serratis, ad basin paulo amplexicaulis, supra scaberrimis, subtus scabridis et parce pilosis; inflorescentiis terminalibus spicatis dense multifloris.

Herb 30--40 cm. tall; stems and branches acutely tetragonal, hollow, pilose-pubescent with short spreading hairs, somewhat less so in age, the hairs whitish or sordid; nodes annulate; principal internodes 2.5--7 cm. long; leaves decussate-opposite and sessile; blades chartaceous, uniformly bright-green on both surfaces, lanceolate, 2.5--6 cm. long, 6--12 mm. wide, acute (or the upper only somewhat attenuate-acute) at the apex, somewhat clasping at the base, sharply and rather irregularly serrate along the margins, very scabrous above, scabridous and rather sparsely pilose beneath, especially along the larger veins; midrib slender, somewhat impressed above, prominent beneath; secondaries very slender, 6 or more per side, somewhat

impressed above, sharply prominent beneath, ascending, slightly arcuate; veinlet reticulation rather obscure on both surfaces; inflorescence terminal, spicate; peduncles acutely tetragonal, 9--12 cm. long, rather abundantly spreading-pilose with stiff white hairs standing at right angles to the peduncle; spikes 5.5--8 cm. long, densely many-flowered; bractlets lanceolate-ovate, 5--7 mm. long, attenuate-acuminate, 1--1.5 mm. wide at the base, rather abundantly whitish-pubescent on the back and densely long-ciliate on the margins; calyx tubular, about 1 cm. long, 5-costate, abundantly white-pilose; corolla-tube bright-rose, about 12 mm. long, densely pubescent on the outside above the calyx, its limb about 6 mm. in diameter.

The type of this species was collected by A. G. Schulz (no. 284) -- in whose honor it is named -- in swampy ground on a low campo at Colonia Benitez, Chaco, Argentina, on December 7, 1933, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo.

VERBENA THYMOIDES f. **ALBIFLORA** Moldenke, f. nov.

Hæc forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by José Arechavaleta at Cerro de Nico Perez and Sierra de Tapanbai, dept. Minas, Uruguay, in November or December, 1892, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo.

VITEX TRIFOLIA var. **HETEROPHYLLA** (Mak.) Moldenke, comb. nov.

Vitex rotundifolia var. heterophylla Mak., Ill. Fl. Nipp. 186. 1940.

ADDITIONAL NOTES ON THE ERIOCAULACEAE. III

Harold N. Moldenke

The present notes are supplementary to the material contained in my booklets entitled "The known geographic distribution of the members of the Eriocaulaceae, together with a check-list of scientific names proposed in this group" (62 pp., 1942), "The known geographic distribution of the members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae" (215 pp., 1949), and "A list showing the location of the principal collections of Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae. Supplement 1" (29 pp., 1947) and my publications on members of this family in *N. Am. Fl.* 19: 17--50 (1937); *Brittonia* 3: 157--159 (1939); *Lloydia* 2: 170 (1939); *Carnegie Inst. Wash. Publ.* 522: 137--223 (1940); *Lundell, Fl. Texas* 3↓: 1--89 (1942); *Wrightia* 1: 220--246 (1948); *Ann. Mo. Bot. Gard.* 27: 268--269 (1940), 28: 411

(1941), and 31: 65--71 (1944); Bull. Torrey Bot. Club 68: 67--70 (1940) and 75: 194--204 (1948), and Phytologia 1: 309--336 & 343--364 (1939), 2: 6--32 (1941), 123--128 (1945), 152--168 (1946), 349--352 and 372--381 (1947), 490--499 (1948), and 3: 79--80 & 141--144 (1949).

The abbreviations employed herein for the names of herbaria in which material is deposited are as follows: Al = New York State Museum, Albany; An = Institut Francais d'Afrique Noire, Dakar, Senegal; Au = University of Texas, Austin; Ba = L. H. Bailey Hortorium, Cornell University, Ithaca, New York; Bl = University of Colorado, Boulder; Br = Jardin Botanique de l'Etat, Brussels; Bt = Butler University, Indianapolis, Indiana; Bu = W. M. Buswell Herbarium, University of Miami, Coral Gables, Florida; C = Columbia University Herbarium, New York Botanical Garden; Co = Colorado College, Colorado Springs; Cm = Carnegie Museum, Pittsburgh; D = Academy of Natural Sciences, Philadelphia; Dm = C. C. Deam Herbarium, Bluffton, Indiana; Dp = DePauw University, Greencastle, Indiana; Du = Dudley Herbarium, Leland Stanford University, Stanford, California; E = Missouri Botanical Garden, St. Louis; Ec = Universidad Nacional de Loja, Ecuador; Es = Estacion Experimental Agronomica, Santiago de las Vegas, Cuba; F = Chicago Natural History Museum, Chicago; Fl = University of Florida, Gainesville; Ga = Georgia Agricultural Experiment Station, Experiment; Gg = California Academy of Sciences, San Francisco; Go = Botaniska Trädgård, Göteborg, Sweden; H = Duke University, Durham, North Carolina; Ha = Colegio de la Salle, Vedado, Havana; Hu = Sam Houston State Teachers College, Huntsville, Texas; I = Langlois Herbarium, Catholic University of America, Washington; Ja = Museo Nacional, Rio de Janeiro; Je = William Jewell College, Liberty, Missouri; K = Royal Botanic Gardens, Kew; Ka = Kansas State College, Manhattan; Lg = Fritz Lemperg Herbarium, Hatzendorf, Steiermark, Austria; M = Meisner Herbarium, New York Botanical Garden; Md = University of Maryland, College Park; Me = Instituto de Biologia, Universidad Nacional de México, Mexico City; Mg = Montreal Botanical Garden, Montreal; Ml = Instituto Miguel Lillo, Tucumán, Argentina; Mr = Morehead State College, Morehead, Kentucky; Ms = University of Massachusetts, Amherst; N = Britton Herbarium, New York Botanical Garden; No = North Carolina State College, Raleigh; Nt = North Texas State Teachers College, Denton; Ob = Oberlin College, Oberlin, Ohio; Or = Oregon State College, Corvallis; Ot = National Herbarium of Canada, Ottawa; Pa = College of Pharmacy Herbarium, New York Botanical Garden; Pl = State College of Washington, Pullman; Po = Pomona College, Claremont, California; Pr = Princeton University Herbarium, New York Botanical Garden; R = Trinidad & Tobago Botanical Garden, Port-of-Spain, Trinidad; Rh = Government Herbarium, Salisbury, Southern Rhodesia; Se = University of Washington, Seattle; Sg = Museo de Historia Natural, Santiago, Chile; Si = Instituto Darwinion, San Isidro, Argentina; Sm = Southern Methodist University, Dallas, Texas; St = Oklahoma Agricultural and Mechanical College, Stillwater; T = Torrey Herbarium, New York Botanical Garden; Tr = S. M. Tracy Herbar-

ium, Texas Agricultural Experiment Station, College Station; Ur = University of Illinois, Urbana; Va = Vanderbilt University, Nashville, Tennessee; Ve = Museo Comercial de Venezuela, Caracas; Vi = Marie-Victorin Herbarium, Montreal Botanical Garden, Montreal; Vt = University of Vermont, Burlington; W = United States National Herbarium, Smithsonian Institution, Washington; We = West Virginia University, Morgantown; Wh = Faculdade de Farmacia e Odontologia, Universidad de São Paulo, Brazil; Xa = Blytt Herbarium, St. Xavier's College, Fort, Bombay, India; and Z = H. N. Moldenke Herbarium, New York Botanical Garden, New York City.

ERIOCAULON Gronov.

Literature references: Gronovius ex L., Gen. Pl., ed. 2, no. 81. 1743; L., Sp. Pl., ed. 1, 87. 1753; L., Gen. Pl., ed. 5, 38. 1754; Penhallow, Brit. Assoc. Adv. Sci. Bradford Meeting 1900: 335. 1900; Massart & al., Mission Biol. Belge au Brésil 1922-1923, 1: fig. 371. 1929; on. cit., 2: fig. 645e. 1930; W. C. Kuenscher, Cornell Univ. Agr. Exp. Sta. Bull. 652. 1936; H. Pittier, La Mesa de Guanipa, Ensayo de Fitografía 45. 1942; Niemeyer & Stellfeld, Arch. Mus. Parana. 3: 24. 1943; B. P. Reko, Bol. Soc. Bot. Mex. 4: 36. 1946; R. Espinosa, Estud. Bot. Sur Ecuad. 1: 73. 1948. -- Eriocaulon L. ex Britton & Br., Ill. Fl., ed. 2 rev., 1: 453. 1936; Hara, Bot. Mag. Tokyo 53: 406. 1938. -- Eriocaulon [Gronov.] L. ex B. L. Robinson & Fernald in Gray's New Man. Bot., ed. 7, 261. 1908; Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944.

I regard Lasiolenis Böck. as a generic synonym of Eriocaulon instead of placing it as synonymous "in part" with Eriocaulon and "in part" with Paepalanthus, as Ruhland does. In the original publication, Flora 56: 90--91 (1873), three species are described, but none is designated as the type species. These three species are: 1. L. brevifolia, 2. L. pilosa, and 3. L. aquatica. Of these L. brevifolia is conspecific and synonymous with Eriocaulon lasiolenis Ruhl., L. pilosa with Paepalanthus Lamareldii Kunth, and L. aquatica with Eriocaulon melanocephalum Kunth. In cases such as this it is the common practice to regard the first-mentioned species as the type species [lectotype]. Doing this here, Lasiolenis falls directly into the synonymy of Eriocaulon.

The G. Gardner 4387 distributed in some herbaria as an Eriocaulon is actually a species of Xyris.

Germination studies on Eriocaulon are reported on by Kuenscher in the reference cited above. Pittier, in the reference also cited above, lists an unidentified species of this genus from Pariaguán, Venezuela, in the collection of Miss Alicia Hernández. I have not yet seen this specimen.

ERIOCAULON ACHITON Körn.

Additional citations: INDIA: Assam: W. Griffith s.n. (F--photo of isotype, K--isotype, N--photo of isotype, Sg--photo of isotype, Z--photo of isotype). Madras: C. B. Clarke 14423 (F--

photo, K, N--photo, Sg--photo, Z--photo), 15728 (F--photo, K, N--photo, Sg--photo, Z--photo), 15728b (F--photo, K, N--photo, Sg--photo, Z--photo).

ERIOCAULON ADAMESII Meikle

Literature references: Meikle, Kew Bull. 1948: 472--473. 1948 [original].

Additional citations: SIERRA LEONE: Adames 97 (N--isotype).

ERIOCAULON AEQUINOCTIALE Ruhl.

The type collection, cited by Ruhland from "Tiramuto", is actually from within the state of Bolívar, Venezuela.

ERIOCAULON AFRICANUM Hochst.

This species has been collected along the margins of streams and has been found flowering in November.

Additional citations: SOUTHERN RHODESIA: Corby 144 [Govt. Herb. Salisbury 22488] (F--photo, N, N--photo, Rh, Sg--photo, Z--photo); A. Newton 18 [Govt. Herb. Salisbury 21224] (Rh). UNION OF SOUTH AFRICA: Cape of Good Hope: Tyson s.n. [MacOwan & Bolus 1203] (N--photo, Vt, Z--photo).

ERIOCAULON AFZELIANUM Wikstr.

Additional citations: SENEGAL: Monod 2 (N).

ERIOCAULON ALATUM H. Lecomte

The collection cited below was previously confused with E. Merrillii Ruhl. It was collected in anthesis in January.

Additional citations: PHILIPPINE ISLANDS: Luzon: M. Ramos s.n. [Herb. Philipp. Bur. Sci. 1831] (N).

ERIOCAULON ALPESTRE Hook. f. & Thoms.

This species has been confused with E. sexangulare L. and "E. Sieboldianum Steud." It has been collected in anthesis in August.

Additional citations: INDIA: Sikkim: J. D. Hooker s.n. [Sikkim] (K). CHINA: Fukien: Chung 7326 (N), 7328 (N). JAPAN: Hokkaido: Tokubuchi s.n. [Aug. 22, 1894] (D--824282).

ERIOCAULON AMPHIBIUM Rendle

Literature references: Rendle, Journ. Linn. Soc. Lond. Bot. 37: 475. 1906 [original]; Arwidsson, Bot. Notiser 1934: 83. 1934.

The type of this species is Gibbs 210 from Southern Rhodesia. The species is related to E. lacteum Rendle, but "differing from all other African species in having the sepals of the female, as well as of the male, flowers connate." It was reduced to synonymy under E. lacteum by Ruhland, but reinstated as a valid species by Arwidsson.

ERIOCAULON ANNUM Milne-Redhead

Additional citations: SOUTHERN RHODESIA: Wald 2511 [Govt.

Herb. Salisbury 20028] (F--photo, N, N--photo, Rh, Sg--photo, Z--photo).

ERIOCAULON ARECHAVALETAE Herter

Literature references: Castellanos in Descole, Gen. Sp. Pl. Argent. Eriocaulac. 81, pl. 14 & 15. 1945.

Synonymy: Eriocaulon latifolium Arech., Anal. Mus. Montevid. 44: 21. 1902 [not E. latifolium J. Sm. in Rees, Cyclop. 13. 1809, nor E. latifolium Bong., Mém. Acad. Pétersb., sér. 6, 1: 631, pl. 64. 1831].

The T. Meyer 2003 and 3055 previously regarded by me as representing this species are now cited by me under E. magnum Abbiatti.

Additional citations: URUGUAY: Castellanos s.n. [Herb. Inst. Miguel Lillo 15167] (Lg, N), s.n. [Herb. Inst. Miguel Lillo 15181] (N); Lombardo 5015 (N); Moldenke & Moldenke 19694 (Es, Mg, Mr, N, N, N, No, Ot, Sm).

ERIOCAULON ARENICOLA Britton & Small

Literature references: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47, 105, & 114. 1946.

The species is said by Alain to be endemic in the white sand on the savannas at Sabana de los Indios on the Isla de Pinos. It has been collected in anthesis in February.

Additional citations: ISLA DE PINOS: León & Carabia 18842 (N); León & Victorin 18842 (Ha); Victorin & Alain 167, in part (Ha).

ERIOCAULON ARGENTINUM Castellanos

Literature references: Castellanos in Descole, Gen. Sp. Pl. Argent. Eriocaulac. 83, pl. 18B. 1945 [original].

ERIOCAULON ATABAPENSE Moldenke

The Williams 14084 specimen cited below has viviparous heads. The species has been confused with E. Humboldtii Kunth and E. tenuifolium Klotzsch.

Additional citations: VENEZUELA: Amazonas: Ll. Williams 13858 (N--isotype, N--isotype, N--photo of type, W--1832612--type), 14084 [Herb. Hac. Venez. 18466] (Ve). State undetermined: Herb. Hac. Venez. s.n. (N, Ve). BRITISH GUIANA: A. C. Smith 2280 (N).

ERIOCAULON ATRUM Nakai

Additional citations: JAPAN: Honshiu: Baker & Baker s.n. [9-2-14] (F--photo, Gg--105744, N, N--photo, Si--photo, Z--photo).

ERIOCAULON AUSTRALE R. Br.

The species has been collected in tea swamps and at stream margins. The Gressitt 550 from the Liukiu Islands, previously regarded by me as representing this species, is now cited by me under E. Wallichianum Mart. The true E. australe is not

known from the Liukiu Islands.

Additional citations: CHINA: Kwangtung: T. Sampson 168 [363] (D--824280), s.n. [Canton] (Pa). BRIBIE ISLAND: M. K. Clemens s.n. [April 20-30, 1944] (Or--49630). DOUBLE ISLAND: M. K. Clemens s.n. [Oct. 16, '46] (Or--56192).

ERIOCAULON BEAUVERDI Moldenke

Synonyms for this species are Eriocaulon helichrysoides var. giganteum Beauverd and E. giganteum (Beauverd) Beauverd.

Additional citations: BRAZIL: São Paulo: W. Hoehne 753 (N, Wh, Wh); Löfgren s.n. [Herv. Comm. Geogr. e Geol. 451; Herb. Inst. Biol. 10202] (N); Moldenke & Moldenke 19643 (Es, Lg, Mg, Mr, N, N, No, Ot, Sm); Pickel 5472 (N).

ERIOCAULON BENTHAMII Kunth

Literature references: Eriocaulon Benthamii Kunth, Enum. Pl. 3: 545. 1841; Jacks., Ind. Kew. 1: 877. 1895; W. C. Leavenworth, Am. Midl. Nat. 36: 164. 1946. -- Eriocaulon Benthamii Kunth apud Ruhl. in Engl., Das Pflanzenreich 42²: 42, 48, 49, & 284. 1903.

The species inhabits the black muck of swamps at altitudes of about 5000 feet and has been collected in anthesis in August and November.

Additional citations: MEXICO: México: Hinton 627 (N), 3638 (N), 4549 (N). Michoacán: W. C. Leavenworth 659 (Ur). Veracruz: Pringle 11871 (Vt).

ERIOCAULON BIFISTULOSUM Van Heurck & Muell.-Arg.

This species is very similar to the American E. melanocephalum Kunth. The only differences that I can find between the two species are that in the American plant the heads are usually blacker, the receptacular and involucre bractlets blacker, and the petals of the staminate florets glandular. In the African species the heads are grayer, the involucre and receptacular bractlets much lighter or the latter may even be translucent, and the petals are eglandular. N. E. Brown in Fl. Trop. Afr. 8: 240 (1901) first suggested the reduction of the African to the American species, and E. Milne-Redhead, in a letter to me dated May 14, 1947, also suggested it. E. bifistulosum has been collected at 5000 feet elevations in Southern Rhodesia.

Additional citations: FRENCH WEST AFRICA: French Soudan: Monod s.n. [27-XI-1945] (N). SIERRA LEONE: Adams 94 (N). SOUTHERN RHODESIA: Brain 4475 [Govt. Herb. Salisbury 10737] (Rh); Dehn 769 [Govt. Herb. Salisbury 10360] (Rh); F. Eyles 65 (Rh); 321 (Rh); Herb. Queen Victoria Memorial 8184 (Rh); Wild 2523 [Govt. Herb. Salisbury 20051] (N, Rh).

ERIOCAULON BILOBATUM Morong

The species has been found in wet places, wet hollows in rocky slopes, and wet mud bordering swamps, at altitudes of from 2860 to 5000 feet. It has been confused with "E. jalisca-num S. Wats.", a name which applies in part to E. Schiedeannum

Körn., and has been collected in anthesis in October.

Additional citations: MEXICO: Jalisco: Pringle 3855 [Herb. Inst. Biol. Univ. Nac. Mex. 2599] (Cc--isotype, D--518026--isotype, D--824268--isotype, Du--199984--isotype, Es--isotype, Me--isotype, Me--isotype, Me--isotype, Ob--23883--isotype, Pa--isotype, Vt--isotype), 6299 [Herb. Inst. Biol. Univ. Nac. Mex. 2600] (Br, Cc, Cm, D--824267, Gg--152419, Me, Me, Me, Vt). GUATEMALA: Jutiapa: Steyermark 30405 (F--1038456, N, N).

ERIOCAULON BRACHYPEPLON Körn.

The material cited by Ruhland from "Neu Mecklenberg" is from New Ireland in the Bismark Archipelago.

ERIOCAULON BREVISCAPUM Körn.

Additional citations: INDIA: Bombay: W. A. Talbot 1379 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON BROWNIANUM Mart.

The type of this species is Wallich 6066, collected by De Silva and Gomez in Silhet. The Philadelphia sheet cited below is obviously of this collection, but bears the incorrect label "6071" and was identified as E. luzulaefolium Mart. It is apparently a case of mixed labels, for several other Wallich specimens of this genus at Philadelphia have curiously mixed and interchanged labels.

Additional citations: INDIA: Assam: Hooker f. & Thomson s.n. [Mont. Khasia] (C); De Silva & Gomez s.n. [Wallich 6066] (D--824256, in part--isotype, M--isotype).

ERIOCAULON BUCHANANII Ruhl.

The species has been collected at 1600 m. elevation in British Nyasaland.

Additional citations: SOUTHERN RHODESIA: N. C. Chase 886 [Govt. Herb. Salisbury 22183] (Rh); Herb. Queen Victoria Memorial 8121 (Rh); Wild 2510 [Govt. Herb. Salisbury 20027] (Rh). BRITISH NYASALAND PROTECTORATE: J. Buchanan 1168 (W--807261); Stolz 1344 (D--824283, E--892113, Mg, N).

ERIOCAULON BUERGERIANUM Körn.

The species has been found in open grassy places and abundant in sandy soil of swamps and rice terraces at almost sea level, flowering in December and fruiting in November.

Additional citations: UNION OF SOCIALIST SOVIET REPUBLICS: Buryato-Mongolskaya: Bohnhof 294 (N). CHINA: Kwangtung: W. T. Tsang 20687 (Ls, N, N, Ob--89891). Yunnan: Maire 3925 (N). HAINAN ISLAND: Liang 66137, in part (N).

ERIOCAULON BURCHELLII Ruhl.

The specimen cited below has peduncles up to 11 1/2 inches long and is thus quite different from the type, but its vivipary is just as pronounced and it is otherwise quite similar. I think that the type collection was merely a depauperate speci-

men. The plant is said by Archer to be "aquatic". If this is true, then the length of the peduncles is probably very variable, depending on the depth of the water, as it is in E. sextangulare Wt. It has been collected in anthesis in August.

Additional citations: BRAZIL: Minas Geraes: Archer 3614 (W--1705658).

ERIOCAULON CAESIUM Griseb.

The species has been found in savanna grass along footpaths.

Additional citations: TRINIDAD: W. E. Broadway 2145 (Br, D--583031, Du--120673); Trin. Bot. Gard. Herb. 3292 (F--photo, H, H, N--photo, R, Si--photo, W--933493, Z--photo).

ERIOCAULON CEYLANICUM Körn.

The species has been collected at 2200 m. altitude.

Additional citations: CEYLON: Kuntze 20046 (N).

ERIOCAULON CINEREUM R. Br.

Specimens of this species have been confused in herbaria with various species and have been distributed as E. truncatum Hamilt., E. sextangulare L., "E. hexangulare L.", "E. heteranthum Benth.", "E. fimosanum Hayata", E. xeranthemum Mart., E. quinquangulare L., and "E. Sieboldianum Sieb. & Zucc." It is apparently a common plant of rice fields and mud of dried ponds in India, at altitudes of 5200 to 6000 feet. The California collection is from plants said to have been submerged except for the upper part of the flowering scapes in the Krause rice fields at Modesto, collected on September 18, 1947. The specimens are huskier and larger in all their parts than typical E. cinereum.

Additional citations: CALIFORNIA: Stanislaus Co.: Markos s.n. (H). INDIA: Assam: H. Bruce s.n. [Herb. Wallich 6073a] (C, H). Bombay: Santanau 8101 (N, Xa); Stocks, Law, etc. s.n. (C). Chota Nagpur: C. B. Clarke 24750 (K). Kashmir: Koelz 9040 (H); R. R. Stewart 3268 1/2 (D--615824), 3350 1/2 (N), 8449a (H). Madras: E. W. Erlanson 5652 (N). West Bengal: C. B. Clarke 7938 (K); W. Griffith 5565 (C), 5579 (C); Wallich 6072b (C). State undetermined: H. Falconer 1192 (T); Herb. Wight s.n. (Pr); Royce s.n. [Himalayas] (D--824281); Wallich 6081 (D--824277); R. Wight 2366 (C), 2368 (C). CHINA: Anhwei: Sun 1344 (N). Chekiang: Chiao 18882 (H). Kwangsi: Steward & Cheo 1097 (H). Kwangtung: E. D. Merrill 10271 (Gg--105743), 10948 (Gg--105742, H). Kweichow: Tsiang 7010 (N). Shantung: E. Faber s.n. [Chefoo] (H). KOREA: Dorsett & Morse 6328 (N). FORENSA: Sasaki 21620 (N). JAPAN: Honshiu: Herb. Sci. Coll. Imp. Univ. s.n. [Sept.] (Vt); Y. Matsumura 6675 (N); Maximowicz s.n. [1862] (C). Island undetermined: Yamaguchi 126 (Pl--51159). HONGKONG: Kuntze 3457 (H); C. Wright s.n. [Hong Kong] (T). HAINAN ISLAND: Lau 1960 (H). BOMAN ISLAND: E. D. Merrill 9846 (Gg--105741). FRENCH INDOCHINA: Annam: Clemens & Clemens 3652 (H). JAVA: Blume s.n. (H).

ERIOCAULON COLLETTII Hook. f.

Additional citations: BURMA: Robertson 233 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON COLLINUM Hook. f.

The species has been collected at 6300 feet altitude.

Additional citations: INDIA: Madras: C. E. C. Fischer 2971 (K); R. Wight s.n. (F--photo, K, N--photo, Sg--photo, Z--photo).

ERIOCAULON COMPRESSUM Lam.

Literature references: Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944; W. A. Merrill, Guide to Florida Plants 34. 1945; Tatnall, Fl. Delaware 75. 1947.

The species is called "pipewort" by Singletary and by Eyles & Robertson, "hatpin flower" by Merrill, and "flattened pipe-wort" by Heritage. It has been collected in moist soil, acid ponds, swamps, flatwoods, pinebarren swamps, cypress swamps, sphagnum bogs, moist pinebarrens, cypress-Ilex swamps, cypress ponds in pinebarrens, wet rich soil of cypress swamps, swampy sandy soil of cutover pastured pine forests, moist sandy pine-lands, shallow peaty ephemeral ponds, boggy peaty ground along rivers, water of swampy woods, wet sand, 6 inches of acid stagnant water, 12--15 inches of water in shallow ponds, on floating islands of sphagnum, prairies, swampy lake shores, sandsoaked areas in flatwoods, at pond margins, borders of swamps, swampy edges of ponds, and along water-filled ditches. It has been collected in anthesis from March to June and in August. Specimens have been confused with and distributed as E. decangulare L., E. septangulare With., E. lineare Small, E. texense Körn., "E. gnaphaloides Michx.", "E. gnaphaloides Michx.", "Eriacolon gnaphalodes Michx.", Lachnocaulon glabrum Körn., and "Nasmythia angustifolia."

Tatnall, in the reference cited above, records the species from Sussex Co., Delaware, and from Wicomico Co., Maryland. The H. L. Stewart specimen cited below is mounted with a specimen of E. septangulare With. from Chenango Co., N. Y., and is labeled "Sylvan Beach" (a locality in Oneida Co., N. Y.), but obviously could not have been collected there. The Banker 3514 cited below has the heads on both its peduncles binary. The heads on E. P. Walker 1532, cited below, are extraordinarily large.

Additional citations: NEW JERSEY: Atlantic Co.: Bassett 3017 (Ka), s.n. [Hammonton, May 27, 1923] (Gu--16255, Fl--61936, Po-231884), s.n. [Hammonton] (Mg, Mg); E. L. Core 5036 (We); Fretz s.n. [Hammonton, July 1, '81] (Al), s.n. [Hammonton, 1881] (Al); C. A. Gross 3018 (Du--90822); Killip 36616 (W--1825935), s.n. [Hammonton Lake, July 19, 1917] (Ur); Mimbauer s.n. [July 8, 1912] (St--22338); Treat s.n. [Hammonton, Aug. 1866] (Ms). Burlington Co.: H. R. Bassler 95 (Ka); Chrysler s.n. [3 June 1931] (Ob--23886), s.n. [18 June 1937] (Fl--97482); Collector undesignated s.n. [Quaker Bridge, 5/28/1843] (Co); E.

L. Core 5076 (We); Drushel 6625 (Vt); E. H. Eames s.n. [Chatsworth, June 12, 1894; Herb. Barnhart 2366] (N, Ur); Fogg 4422 (H--17811); M. A. Johnson s.n. [Chatsworth, 5 June 1934] (Mg); Witte 2078 (We), s.n. [Maker Bridge, June 17, 1928] (N). Camden Co.: H. A. Green 481 (Ms). Ocean Co.: Ewer 1066 (Bt--26456), s.n. [7 June 1933] (Gg--223697); Heritage s.n. [Forled River, 9-6-97] (Ur); Hexamer & Maier s.n. [Manchester pond, Aug. 25, '57] (Cm); Lehman 5 (Bl--48768); MacElwee 658 (Ka--71030, Mg); H. N. Moldenke 10577 (Ba, Ur), 10979 (H); Moldenke & Moldenke 10577 (Go); A. B. Rich s.n. [Tom's River, May 30, 1887] (H--65764); W. A. Weber 168 (Bl--48769). County undetermined: H. R. Bassler 3017, in part (Ka); Brinton 3017 (Gg--105730); Britton, Britton, & Wilson s.n. [June 30--July 4, 1900] (Br); W. M. Canby s.n. [ninebarren swamp, July 1862] (Pa); Collector undesignated s.n. [Squam, 7.17.29] (Cc); Dudley Herb. 54392 (Du); Parker s.n. [Herb. Ill. Indust. Univ. 18383] (Ur); Tatnall s.n. [5/30/43] (Co). DELAWARE: Sussex Co.: W. M. Canby s.n. [Rehoboth Beach, June 1878] (Pa). DISTRICT OF COLUMBIA: E. S. Steele s.n. [July 27, 1897] (Ka--82561). NORTH CAROLINA: Bladen Co.: Ahe s.n. [May 20, 1896] (Ur), s.n. (Ur). Brunswick Co.: Blomquist 5786 (H--9653). Buncombe Co.: M. J. Wright s.n. [July 21, 1897] (Fl--86410). Columbus Co.: Godfrey & White 7104 (Du--266962, Gg--290812, H--55492, H). Cumberland Co.: Biltmore Herb. 2296b (Po--267591). Forsyth Co.: P. O. Schallert 8409 (H--9655). New Hanover Co.: W. M. Canby s.n. [prope Wilmington, Ap. 1873] (Pa); Godfrey & White 7083 (Gg--290811, H--55368, H); C. S. Williamson 129 (Cm). Onslow Co.: H. D. House 5108 (Al). Rowan Co.: A. A. Koller 181, in part (Vt). County undetermined: A. W. Chapman s.n. (Pr); Herb. Lamingani s.n. (Du). SOUTH CAROLINA: Aiken Co.: Cuthbert s.n. [Graniteville, May 12, 1904] (Fl--8403). Berkeley Co.: W. H. Duncan 5988 (H). Darlington Co.: J. B. S. Horton s.n. [Apr. 26, 1921] (Al). Dorchester Co.: Du Bois s.n. [Summerville, April 1889] (Ob--23896). Georgetown Co.: D. S. Correll 289a (H--31140). County undetermined: Curtiss s.n. (Pr). GEORGIA: Baldwin Co.: Boykin s.n. [Milledgeville] (D--781697). Bulloch Co.: Craig & Craig 3380 (Po--248455). Calhoun Co.: Thorne & Menscher 8021 (Gu--31146). Charlton Co.: W. H. Buchanan s.n. [March 24, 1928] (Gu--16003); W. H. Duncan 2010 (H), 3153 (Gu); E. P. Walker 1532 (St--22602). Cook Co.: Pyron & McVaugh 2138 (Gu--16859, H--52365). Liberty Co.: W. H. Duncan 2241 (H); Grimm s.n. [5-11-43] (Cm). Macon Co.: Pyron & McVaugh 834 (Gu--12565). Ware Co.: Pyron & McVaugh 1481 (Gu--12924). Wayne Co.: W. H. Duncan 4673 (H). FLORIDA: Alachua Co.: J. A. Crawford s.n. [April 12, 1897] (D--504028); Van Hyning s.n. [Apr. 27, 1924] (Ob--23909); G. F. Mober s.n. [Fairbanks, 4-8-23] (Fl--5404, Fl--5406). Baker Co.: Heading s.n. [March, 1887] (Ob--94488), s.n. [Feb. 1892] (Se--3911); West & Arnold s.n. [Taylor, 25 Apr. 1940] (N). Bay Co.:

Banker 3514 (H). Bradford Co.: West & Arnold s.n. [Lawley, 15 May 1940] (H). Brevard Co.: Rhoads s.n. [Cocoa, 4-2-28] (Fl--5409), s.n. [Rockledge, Feb. 7, 1937] (Fl--25824). Broward Co.: E. Z. Bailey s.n. [Feb. 14, 1931] (Ba); Buswell s.n. [March 21, 1942] (Bu). Clay Co.: W. K. Canby s.n. [Hibernia, March 1869] (Pa, Pr). Collier Co.: E. Brainerd s.n. [March 28, 1909] (Vt); C. C. Deam 65398 (N), 65559 (Dm, N). Duval Co.: Biazio 50 (Gg--105756); Curtiss 3017 (Or--2203), 4585 [March 13] (Al, Es), 4585 [April 19] (Al, Es), 6126 (Fl--5419, Ur), s.n. [Jacksonville, 1884] (Ka), s.n. [near Jacksonville, April] (Cm), s.n. [Jacksonville] (Ob--23894); Fredholm 500 (Po--119242); Light-hine s.n. [So. Jacksonville, April 6, '97] (Ur, Ur); Mrs. Sampson s.n. [Jacksonville, May 1873; Herb. Marie-Victorin 5959] (Vi). Escambia Co.: Fassett 21142 (Ob--201997). Franklin Co.: A. Wood s.n. [Apalachicola, Apr. 1857] (Pa). Hillsborough Co.: Britton, Eritton, & Shafer 24 (Cm). Indian River Co.: MacDaniels s.n. [Vero Beach, April 16, 1936] (Ba). Jackson Co.: Exo-rotation Party 1937 s.n. [Sneads, 15 Mar. 1937] (Fl--27178, H--51382). Lake Co.: A. S. Hitchcock s.n. [vicinity of Eustis, June & July 1894] (Ka); Mrs. L. Jones s.n. [March 25, 1926] (Ob 32458); Nash 92 (Es). Lee Co.: H. H. Holdenke 689a (Go, H--273, Ur); J. P. Standley 15 (Ur). Leon Co.: MacDaniels s.n. [Tallahassee, April 26, 1936] (Ba). Levy Co.: O'Neill 732 (Po--217256). Manatee Co.: Dowell 7054 (Md). Martin Co.: W. F. Buchanan, Jr., s.n. [Stuart, March 23, 1938] (Bt--46593, Gu--16069). Osceola Co.: Bitting 241 (Fl--5420); C. C. Deam 57566 (Dm); S. M. Deam 1825 (Dm); Singletary 47 (H--46212). Palm Beach Co.: H. C. Beardslee s.n. [Lake Worth, Dec. 1927] (Ob--94485); S. M. Deam 1801 (Dm); Randolph & Small 72 (Ba). Pinellas Co.: C. S. Williamson s.n. [St. Petersburg, Aug. 1894] (D--824276). Polk Co.: Buswell s.n. [Bartow, March 15, 1919] (Bu); McFarlin 4491 (Po--221868). Sarasota Co.: B. H. Smith s.n. [Osprey, March 4, 1904] (Cm, H--23026). Seminole Co.: H. C. Beardslee s.n. [Longwood, April 1928] (Ob--94483), s.n. [Longwood, Apr. 1931] (Ob--94487), s.n. [near Oviedo, March 14, '35] (Ob--94486), s.n. [April 3, 1940] (Ob--94482); Blanton 6512 (Ba); Glück 8409 (H--9658). Volusia Co.: Halfert s.n. [Port Orange, 4-3-34] (Bt--20086); Hulst 162 (Ob--23898). County undetermined: Calkins s.n. [Feb. 1883] (Ka); A. W. Chapman s.n. [Florida] (D--824262); A. Gray s.n. (Br); Herb. Univ. Vermont s.n. (Vt); S. H. Wright s.n. (Du--90824). ALABAMA: Coffee Co.: C. Schäffer s.n. [Enterprise, 2.17.83] (D--824264). MISSISSIPPI: Hancock Co.: Rose-Innes & Warnock 716 (Au, N). Jackson Co.: F. S. Earle s.n. [Ocean Springs, Mar. 20, 1888] (Cm, H--65762, Po--185876). LOUISIANA: Calcasieu Par.: E. J. Palmer 7718 (Gg--183012, Mg, Mg). Orleans Par.: E. P. Riley s.n. [Oct. 31, 1937] (Se--49424). Saint Tammany Par.: Bonhard s.n. [Pearl River, Mar. 20, 1927] (Cm). TEXAS: Hardin Co.: E. J. Palmer 9563

(Du--201605); Parks & Cory 22518 (Tr); Tharp s.n. (July 20, 1929) (Au). Jefferson Co.: Hooks s.n. [Beaumont, May 3, 1930] (Au, K), s.n. [Beaumont, 5/30/34] (Au). LOCALITY UNDESIGNATED: Herb. Canby s.n. (Cc); Herb. Chapman s.n. [Southern States] (Ms); T. Kuttall s.n. (D--824265); H. L. Stewart s.n. [Sylvan Beach, Aug. 16, 1888] (Po--186013, in part).

ERIOCAULON COMPRESSUM var. HARPERI Moldenke

The variety has been collected in wet sandy ditches and in dry sandy pinelands, sometimes growing along with the typical form (according to Banker), flowering in February, April, and May. It has often been confused with typical E. compressum, but some material actually resembles E. lineare. Small much more closely than it does typical E. compressum.

Additional citations: FLORIDA: Bay Co.: Banker 2583 (N). Calhoun Co.: Bailey & Bailey s.n. [Tawahitchka, Apr. 2, 1933] (Ba). Lee Co.: H. N. Moldenke 689 (Go, H--376, Ob--23899, Ur). Talulla Co.: H. N. Moldenke 1123 (Go, H--4404, Ob--23884, Ur). County undetermined: Chapman s.n. [S. Fla.] (Du--90412). MISSISSIPPI: Harrison Co.: L. H. Bailey 7313 (Ba); Tracy 5032 (Dm). Jackson Co.: Shehan 22541 (Ur).

ERIOCAULON CONICUM (Fyson) C. E. C. Fischer

Additional citations: INDIA: Madras: C. E. C. Fischer s.n. [Ganjan Distr.] (F--photo, K, N, H--photo, Sg--photo, Z--photo).

ERIOCAULON CRASSISCAPUM Bong.

Literature references: Castellanos in Dascole, Gen. Sp. Pl. Argent. Eriocaulac. 87, pl. 17. 1945; Abbiatti, Revist. Mus. La Plata Bot. 6 (26): 329. 1946.

Additional citations: BRAZIL: Minas Geraes: Collector undesignated s.n. [Mart. 1839] (Du); Regnell III.1264 [22/11/1864] (W--937198).

ERIOCAULON CRISTATUM Mart.

Specimens of this species have been distributed in herbaria as "E. quinqueangulare Tenore", "E. 5-angulare L.", and "E. melaleucum Mart."

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Khasia] (K). West Bengal: N. Griffith 3378 (C). CHINA: Province undetermined: Collector undesignated 570 (K); E. Faber s.n. (N). STRAITS SETTLEMENTS: Malacca: Benj. Heyne 13 (Dr). LOCALITY OF COLLECTION UNDETERMINED: Sinons 137 [Franklin] (K).

ERIOCAULON CUSPIDATUM Dalz.

Additional citations: INDIA: Bombay: H. A. Talbot 1083 (F--photo, K, N, H--photo, Sg--photo, Z--photo).

ERIOCAULON DALZELLII Körn.

Specimens of this species have been confused with and distributed in herbaria as "E. argenteum Mart.", "E. pentangulare

L.", and E. setaceum L.

Additional citations: INDIA: Bombay: Stocks s.n. (K). West Bengal: W. Griffith 5564 (C). State undetermined: Herb. R. Wight 2855 (T); T. Philippi s.n. [India orient. 1849] (G--105735). CEYLON: Walker-Arnott s.n. [1850] (C); R. Wight s.n. (R).

ERIOCAULON DECAANGULARE L.

Literature references: The Carolinian Florist of Governor John Drayton of South Carolina 14. 1943; Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944; W. A. Merrill, Guide to Florida Plants 34. 1945; Rhodora 48: iv & 58. 1946; Tatnall, Fl. Delaware 75. 1947.

The species has been collected in open white gravel bogs, marshy ground, moist sandy soil, marshes, bogs, streams, water pools, wet sinks, wet pinewoods, swamps, swampy ground, pine-barren ponds, swampy places in pinebarrens, sandy bogs, mountain bogs, pinebarren swamps, wet places, shallow stagnant pools, low moist grassy soil in open prairies, seepage on high open hills, wet pasture soil, black boggy soil, roadside ditches, drainage ditches, pasture peat bogs, wet pinebarrens, damp places in open fields, sphagnum-magnolia swamps, sphagnum-cranberry bogs, wet sandy savannas, shallow mud-hole ponds, and grass-sedge bogs and at edges of ponds. Sometimes it forms very large tufts in damp sand of low meadows. It is frequently common on savannas, and has been collected from about sea level to 2500 feet elevation, blooming from May to December.

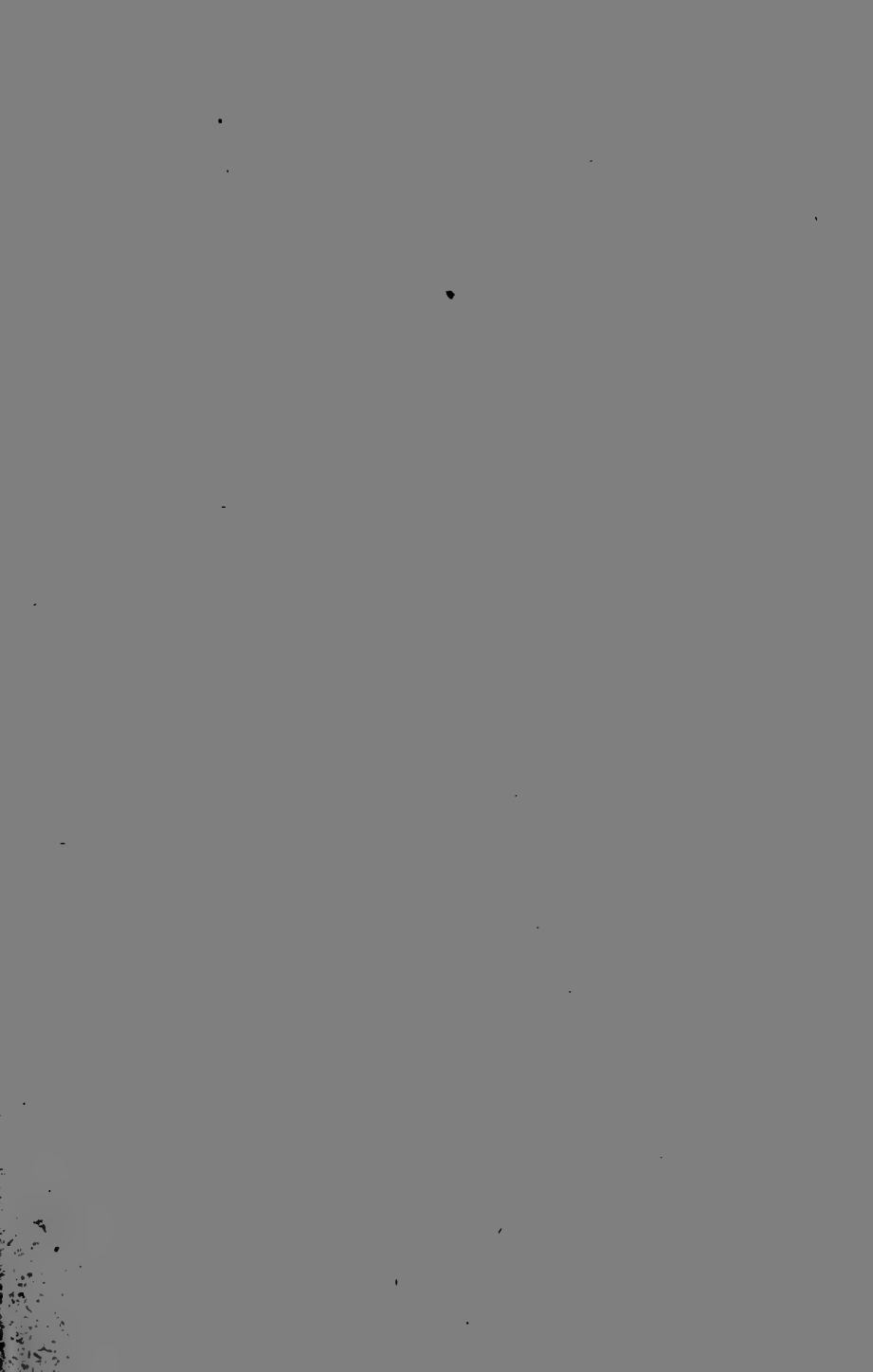
It is called "pipe-wort" by Curtiss, "pipewort" by Gray, Hyams, and Warner, "ten-angled pipewort" by Heritage, and "ten-angled pipewort" by Schallert. It often grows with E. compressum Lam. and specimens are sometimes found mixed with this species on herbarium sheets. It is often confused with and distributed as E. compressum Lam., E. Ravenellii Chasrn., E. lineare Small, E. texense Körn., "E. decemangulare L.", "E. Ravenellii Chasrn.", "E. articulatum Morong", "E. floridanum Chasrn.", "E. mapthalodes Michx.", "E. serotinum Walt.", and "E. compressum Lam."

The Thorp s.n. [July 20, 1929] specimen at Austin has a 9-costate scape. The Twining specimen cited below is labeled as having been collected at "Lake Poyntelle, Aug. 1, 1907". This locality is in Wayne County, Pennsylvania. Dr. Fogg (1939) says "This locality is almost certainly in error. The species is unknown in Pennsylvania." W. L. Dix, in a letter to me, concurs in this opinion and thinks it must be a case of mixed labels, although he admits that "Twining was a very careful collector. There is no specimen of the species in the Everhart Museum at Scranton from this locality. It is not listed in Twining's 'Flora of Northeastern Penna.'" It is, however, of interest to note that there is in the Brussels herbarium a Schweinitz specimen, collected in 1829, also labeled as from Pennsylvania.

The Correll & Corroll 9960 specimen cited below bears the annotation "approaching E. benthami Kunth" of Mexico.

Additional citations: NEW JERSEY: Atlantic Co.: Bartram s.n. [Harmonton, Aug. 4, 1907] (Mg); W. M. Canby s.n. [Absecon, Aug. 1858] (Pa); Gershoy 203 (Ob--61423); C. A. Gross 3016 (Du--90825), s.n. [near Weymouth, Aug. 15, 1883] (Ur, Ur); Parkær s.n. [Herb. Ill. Indust. Univ. 18382] (Ur); C. S. Williamson s.n. [Egg Harbor, Sept. 16, 1905] (Dm). Burlington Co.: L. A. Chase 3552 (Ur, Ur); Chrysler s.n. [13 Aug. 1937] (H--56529, Pl--97487); Chrysler & Johnson s.n. [Aug. 11, 1936] (Mg); Commons s.n. [Atsion, Oct. 1, 1872] (Cm); Dreisbach 1029 (Cm), 2206 (Cm); E. H. Eanos s.n. [Sept. 15, 1897] (Gg--105749); A. A. Eaton s.n. [Quaker Bridge] (Co); Fogg 4756 (Mg); Heritage s.n. [Atsion, 9-20-85] (Ur); F. M. Hexamer s.n. [16 Aug. 1856] (Br); W. Stone s.n. [Parkdale, Aug. 1906] (Cm); Treat s.n. [Atsion, July 1866] (Al), s.n. [Atsion, Aug. 1866] (Ms); Witte s.n. [Aug. 12, 1928] (H), s.n. [Hampton Furnace, Sept. 1, 1928] (Mg). Camden Co.: Bassett s.n. [Atco] (Mg); H. A. Green 474 (Ms); Martindale s.n. [Winslow, Sep. 1875] (Je--208); C. C. Stewart s.n. [T. W. Edmondson 2958] (N), s.n. [T. W. Edmondson 4365] (H). Cape May Co.: Killip 373 (Po--125212). Cumberland Co.: Monachino 457 (Ec, Ml, N). Hunterdon Co.: Chrysler & Johnson s.n. [Aug. 11, 1936] (Ms); M. A. Johnson s.n. [11 Aug. 1936] (Al). Ocean Co.: E. Cannon s.n. [Sep. 14th, 1888] (Gg--105751); Clute 214 (Bt--3853); Drushel & Carpenter s.n. [Aug. 18, 1935] (Vt); T. W. Edmondson 4366 (N); Eggleston 4894 (Cm); G. B. Grant 6084 (Po--267598); Guttenberg s.n. [Manchester, Sept. 1, '78] (Cm); C. H. Hall s.n. [Manchester, Sept.] (Vt); Henser s.n. [Sept. 4, 1896] (Al); Holton s.n. [Manchester, Aug. 1847] (Pa); Lighthipe s.n. [Tom's River, Sept. 12, 1893] (Vt), s.n. [Forked River, Aug. 31, '95] (Ur, Ur), s.n. [Sept. 14, 1912] (Au); Loughridge & Chrysler s.n. [25 July 1931] (Ob--23887); MacKenzie 2361 (Dm); W. de W. Miller 1333 (N); P. Wilson s.n. [28 July 1909] (Al). County undetermined: Austin s.n. [Pines of N. J., 18/13] (Ms, Ms), s.n. [Pines of New Jersey] (Ba); Bunstead s.n. [Pine barrens, Sept. 18/14] (Ms); W. M. Canby s.n. [1864] (Du--54389); Collector undesignated s.n. [Squam, 7.17.29] (Cc); Herb. Coll. Pharmacy s.n. [Pine barrens, July] (Pa); Herb. Hodgson s.n. [Squam, 7/17/1827] (Cc); Knieskern s.n. (Br); Knobloch 10 [Speedwell] (Al); Lighthipe s.n. [Sept. 1, 1890] (Ob--23890); Horong s.n. [Sept. 1873] (Gg--105752); Treat s.n. [Aug. 1875] (Du--70674); J. Torrey s.n. [1833] (Br), s.n. [1834] (Br). PENNSYLVANIA: County undetermined: Schweinitz s.n. [1829] (Br); Trining s.n. [Lake Foyntello, August 1, 1907] (Cm). DELAWARE: Sussex Co.: W. M. Canby s.n. [Ellendale, Aug. 1874] (Pa); Collector undesignated s.n. [Ellendale, 9/1892] (Cc); Goodale 62508 (H--65760); McVaugh 6596 (N); True 235 (Gu--10663). MARYLAND: Prince Georges Co.: S. F. Blake 10665 (Du--167971, Gg--163594, Gg--207025, Mg, Or--22061, Pl--65180, Po--172502); L. A. Chase 3824 (Ur, Ur), 7527 (Ur). DISTRICT OF COLUMBIA: M. S. Bebb s.n. (Mg); T. Holm s.n. [22/7/1888] (Gg--105750); C. S.

Sheldon s.n. [July 19, 1881] (Al, Ob--23889); E. S. Steele s.n. [July 27, 1897] (H--22972, Ob--23891, Ob--23893), s.n. [Aug. 12, 1897] (Ob--23891); L. F. Ward s.n. [July 13, 1873] (Cm), s.n. [Aug. 5, 1877] (Ba), s.n. [Oct. 3, 1880] (Ba, Cm), s.n. [July 14, 1884] (Cm, Ur). VIRGINIA: County undetermined: A. Gray s.n. (Dr). NORTH CAROLINA: Beaufort Co.: D. S. Correll 1702 (H--34089); R. Gray 92 (Dp--2930). Bladen Co.: Blomquist 10871 (H--53328). Brunswick Co.: Blomquist 5788 (H--9654). Buncombe Co.: Biltmore Herb. 3867a, in part (Co, Ur, Ur). Caldwell Co.: Blomquist 7908 (H--36656). Carteret Co.: R. Gray s.n. [6/28/38] (H--46571). Catawba Co.: Small & Keller s.n. [June 25--26, 1891] (H, Pl--3357, Se--4146). Columbus Co.: A. A. Heller 14112 (Du--157068); F. O. Schallert 73 (Bt--9898), s.n. [Bug Hill, 8/16/27] (Dp--15098), s.n. [8/26/27] (Gg--198564), s.n. [Pareway, 8/4/33] (Bt--18711, Bt--18714, Ga, Ga, H--32999), s.n. [Nakina, 6/25/34] (Or--34493, Or--34527, Wo, We), s.n. [Nakina, 12/27/34] (Bt--26225), s.n. [Nakina, 2/9/35] (Or--34647). Craven Co.: Loomis & Croom s.n. [New Bern] (D--781671). Cumberland Co.: Godfrey 4550 (H--22765); Herb. Philad. Acad. Sci. 824260 (D). Dare Co.: Blomquist 5789 (H--15573); P. O. Schallert s.n. [July 12, '41] (Dp--30384, We), s.n. [7/13/41] (H). Forsyth Co.: Denke s.n. [Winston-Salem, 6/1/1829] (Vt); P. O. Schallert 1803 (H--9657), s.n. [Winston-Salem, 9/1/1921] (Vt). Guilford Co.: Denke 5035 (H--9659). Harnett Co.: Blomquist & Correll 2552 (H--34026). Henderson Co.: Caughy 356 (H--52054); D. S. Correll 3325 (H--34090), s.n. [East Flat Rock, 7/27/1935] (Hs); Wherry & Pannell 14204 (D--81616). Hoke Co.: D. S. Correll 1145 (H--34085). Iredell Co.: H. E. Hyams 162 (Ob--23882, Ob--23895, Ob--23897), s.n. [Statesville] (Ob--23888, Po--119238, Po--119244); Keever 357 (H--73229); Veerhoff 187 (Gg--290776), s.n. [Statesville, July 30, 1934] (H--71825). Jackson Co.: Thaxter s.n. [Callowhee] (Al). Johnston Co.: Ashe s.n. [Wilson's Mills] (Ur). Macon Co.: Boltwood s.n. (Ur). Mitchell Co.: Biltmore Herb. 3867a, in part (H). Rowan Co.: H. A. Chase 3142 (Ur); H. E. Hyams s.n. [Wilmington, Aug. 18, '79] (Vt). Northhampton Co.: D. S. Correll 2356 (H--34042). Onslow Co.: Godfrey 5760 (H--55457), 5821 (H); Randolph & Randolph 969 (Ba). Pender Co.: Bright 6132 (Hg); B. T. Wells s.n. [Big Savannah, July 2, 1924] (Dn). Richmond Co.: D. S. Correll 1089 (H--34087). Rowan Co.: A. A. Heller 181, in part (D--824259, Vt). Sampson Co.: Godfrey 6166 (H), 8108 (H--9173). Scotland Co.: Godfrey 4554 (H--9159). County undetermined: Bosc s.n. [Caroline, 1819] (Du); A. W. Chapman s.n. [H. C.] (Pr). SOUTH CAROLINA: Berkeley Co.: Godfrey & Tryon 803 (H). Clarendon Co.: Godfrey & Tryon 927 (H); W. Stone 530 (D--5544-42). Darlington Co.: J. B. S. Norton s.n. [Apr. 18, 1921] (Al). Dorchester Co.: K. A. Taylor 10366 (Ur). Georgetown Co.: D. S. Correll 5315 (H); Godfrey & Tryon 343 (Gg, H--58712, I, H); H. E. Rhodes s.n. [Georgetown, August 1935] (Dp--2933).



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REGIONAL VEGETATION LITERATURE. III. MASSACHUSETTS

Frank E. Egler

This annotated bibliography is the third of a series designed to cover at least the continental United States. It follows in form and content that established in "I. Connecticut" (*Phytologia* 3(1):1-26, 1948) and "II. Rhode Island" (*Phytologia* 3(2):49-56, 1949). This issue lists 304 references which contain original information on the vegetation of Massachusetts, on its composition, structure, functions, geography, history, and ecologic relationships. As such, it draws on the literatures of floristic taxonomy, forestry, pastures, wildlife, watersheds and soils, insofar as these describe aspects of the natural and seminatural plant communities.

Massachusetts is in an interesting position in regard to knowledge of its vegetation. Close to two centuries of intensive botanical investigations have given us detailed knowledge of its kinds of plants, but almost no other knowledge of its forests and fields. Aside from several popular treatments of local plant communities, there are but a sparse handful of papers written by vegetation scientists, and not a single monographic treatment of the complex of communities of a limited land area.

The author is indebted to the library staff of the New York Botanical Garden for valuable assistance in the preparation of this number. The map was drawn by L. E. Partelow, Weedsport, New York. It will be much appreciated if omissions, errors and additions to this bibliography are brought directly to the attention of the author, for incorporation in a future revision.

State Floras

PTERIDOPHYTA AND SPERMATOPHYTA

1833. *Hitchcock, Edward*. Catalogue of [Massachusetts] plants growing without cultivation. His *Report on the geology, mineralogy, botany, and zoology of Massachusetts*, publ. at Amherst by Massachusetts: 599-651. 19 plates, including folded maps, bound separately as "Plates illustrating the geology and scenery of Massachusetts."

Unannotated list of 1703 plants, including cryptogams. Plates include lithographs of scenes showing vegetation types.

1835. 2nd ed.: 604-651. Same plates bound separately, with map dated 1834. Reprint: *Catalogue of the animals and plants of Massachusetts* with a copious index, 142 p., Amherst, 1835.

Unannotated list of 1737 plants, including cryptogams.

1840. *Dewey, Chester*. Report on the herbaceous flowering plants of Massachusetts, viii, 277 p. *Cambridge: Massachusetts*.
A botanical manual; no keys. Seedplants only.
1846. *Emerson, Geo. B.* A report on the trees and shrubs growing naturally in the forests of Massachusetts, xv, 547 p., 17 pl. *Boston: Massachusetts*. Reprint: *New York, Little Brown*, 1850.
A botanical manual; with keys.
1875. 2nd ed., 2 vols., 149 pl. *Boston: Little Brown*.
Revised and enlarged.
1878. 3rd ed. 1887. 4th ed. 1894. 5th ed.
Apparently reprints. 5 ed. reprinted at later dates.
1859. [*Flint, Chas. Louis.*] Catalogue of [Massachusetts] plants. 7th Ann. Rept. Secr. Mass. Bd. Agric. 1859: appendix i-xii. (The report bound together with separately paged Abstract of Returns ... Title on spine of combined volume: *Agriculture in Massachusetts by C. L. Flint, Second Series, 1859*).
Unannotated list of vascular plants in the herbarium, Latin names only, "examined and arranged by Chas. J. Sprague."
1878. *Hough, F. B.* List of the native trees of Massachusetts, with notes upon certain naturalized species. *Rept. on Forestry: 406-416. Washington: Govt. Printing Office*.
Annotated list, "derived almost wholly from the valuable report of Mr. Emerson."
1907. *Clarke, Daniel A.* The commercial forest trees of Massachusetts, how you may know them, 66 p., illustr. *Boston: State Forester*.
A dendrologic manual of 48 trees, with keys, well illustrated. Subsequent "editions" (2nd, 1908; 3rd, 1911; 4th, 1916) are apparently reprints.
1927. *Illick, Joseph S.* Common trees of Massachusetts, 110 p., 1 t., illustr. *Washington: Amer. Tree Assoc.*
A dendrologic manual, with table of historic trees; no keys.
- 1928-. *Smith, Lyman B.*, chairman of comm. Reports on the flora of Massachusetts. I, *Rhodora* 30:12-19, 1928. II, *Rhodora* 35:351-359, 1933. III, *Rhodora* 44:213-220, 1942. IV, *Rhodora* 49:257-277, 1947.
Annotated list of vascular plants, through Gramineae.

Vegetation Literature Arranged by Localities

GENERAL

1829. *Hitchcock, Edward*. Catalogue of plants growing without cultivation

in the vicinity of Amherst College, 64 p. *Amherst: Amherst College Junior Class.*

Unannotated list of 1447 plants, including cryptogams, occurring within 50 miles of Amherst.

1841. *Russell, John Lewis.* Attempt to ascertain some of the hepatic mosses of Massachusetts, with remarks. *Boston Journ. Nat. Hist.* 3 (for 1840-41):465-469.

Annotated list, *Jungermannia* (Bryophyta) only, probably eastern Massachusetts.

1875. *Tuckerman, Edward, and Chas. C. Frost.* A catalogue of plants growing within thirty miles of Amherst College, 6, 98 p. *Amherst: Nelson.*

Unannotated list, including cryptogams. Sites and localities occasionally given.

1885. *Shaler, N. S.* Sea-coast swamps of the eastern United States. *U.S. Geol. Surv. 6th Ann. Rept. (for 1884-85):* 353-398. F.51-57.

Includes a catalogue of the larger tidal marshes between the Hudson River (New York) and Portland (Maine).

1887. *Cobb, Nathan Augustus.* A list of plants found growing wild within thirty miles of Amherst, 51 p. *Northampton: Bridgman.*

Unannotated list, including cryptogams.

1899. *Clark, Hubert Lyman.* Additions to the flora of Amherst, Massachusetts. *Rhodora* 1:164-165.

Comments on local occurrences of 20 plants, 16 of which are additions.

1900. *Harper, Roland McMillan.* Further additions to the flora of the Amherst region. *Rhodora* 2:68-70.

Annotated list of 21 additions, and annotations on 4 others.

1890. *Dame, Lorin L., and Henry Brooks.* Typical elms and other trees of Massachusetts, with an introduction by Oliver Wendell Holmes, 89 p., 58 pl. *Boston: Little Brown.*

Descriptions and illustrations of historic trees, some of which were part of the original vegetation.

1897. *Saunders, Mary T.* The flora of colonial days. *Essex Inst. Bull.* 27:74-88.

Quotations of botanical interest, from 17th century writers.

1897. *Stone, Geo. Edward.* Massachusetts weeds. *Mass. Crop Rept. (for Sept. 1897):*28-35.

With unannotated list of seedplants, comments on times of introduction, and varying abundances, primarily eastern Massachusetts.

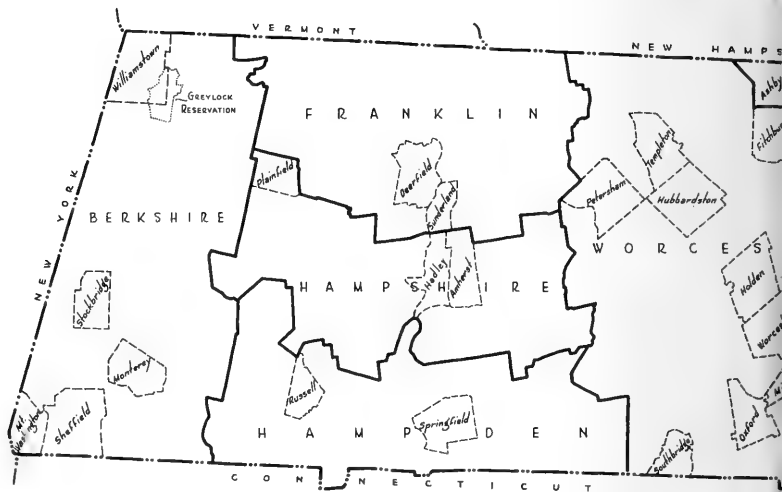
1899. *Stone, Geo. Edward.* Past and present floral conditions in central Massachusetts. *Rhodora* 1:143-148.

General comments on original and present forests. Mainly Franklin, Hampshire and Hampden Counties.

1903. *Blankinship, J. W.* The plant formations of eastern Massachusetts. *Rhodora* 5:124-137.
Species lists and brief comments on 19 types of vegetation, "Cape Ann to Plymouth and from Cape Cod to some 15 miles west of Boston."
1905. *Spring, Samuel N.* The natural replacement of white pine on old fields in New England. *U.S. Dept. Agric. Bull.* 63:32 p.
Origin and development of old-field white-pine stands, with map showing their distribution in the New England states.
1919. *Simmons, James Raymond.* Historic trees of Massachusetts, xxi, 139 p., (illustr., map inside cover) Boston: Marshall Jones. . Rev.: *Amer. For.* 26:213-225, 1920.
Descriptions and illustrations of historic trees, some of which were part of the original vegetation.
1920. *Mayhew, Inez P.* Winter flowers in Massachusetts. *Amer. Bot.* 26:140-141.
Popular account of plants flowering in winter. Unnamed locality on the coast.
1925. *Cline, A. C., C. R. Lockard, and Richard T. Fisher.* Mixed white pine and hardwood. *Harvard For. Bull.* 8:67 p., 13 f., 4 t.
With sections on origin and development of old-field white-pine and pine-hardwood communities. North-central Massachusetts and south-western New Hampshire.
1926. *Starr, Anna M.* Massachusetts [natural areas and regions]. V. E. Shelford's *Naturalist's Guide to the Americas*, publ. at Baltimore by *Williams & Wilkins*: 318-326.
Brief description of state, with conspectus of 37 public areas and 10 proposed areas of notable vegetation.
1927. *Forbush, E. H.* The faunal areas of New England. *His Birds of Massachusetts and other New England states*, publ. at Boston by *Mass. Dept. Agric.*, 2:xviii-xxiii, folded map.
With description of vegetation of Canadian, Transition and Carolinian Zones.
1929. *Cook, H. O.* A forest survey of Massachusetts. *Journ. For.* 27:518-522, 2 t.
Summary of state-wide survey, with data on classes of land (forest, crop land, etc.) by counties, and on forest areas by types and size classes.
1929. *Gevorkiantz, S. R., and N. W. Hosley.* Form and development of white pine stands in relation to growing space. *Harvard Forest Bull.* 13:83 p., 3 f., 23 t.

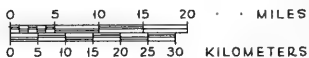
Relation of density to form, taper, etc., natural and planted pure white pine, northern Massachusetts.

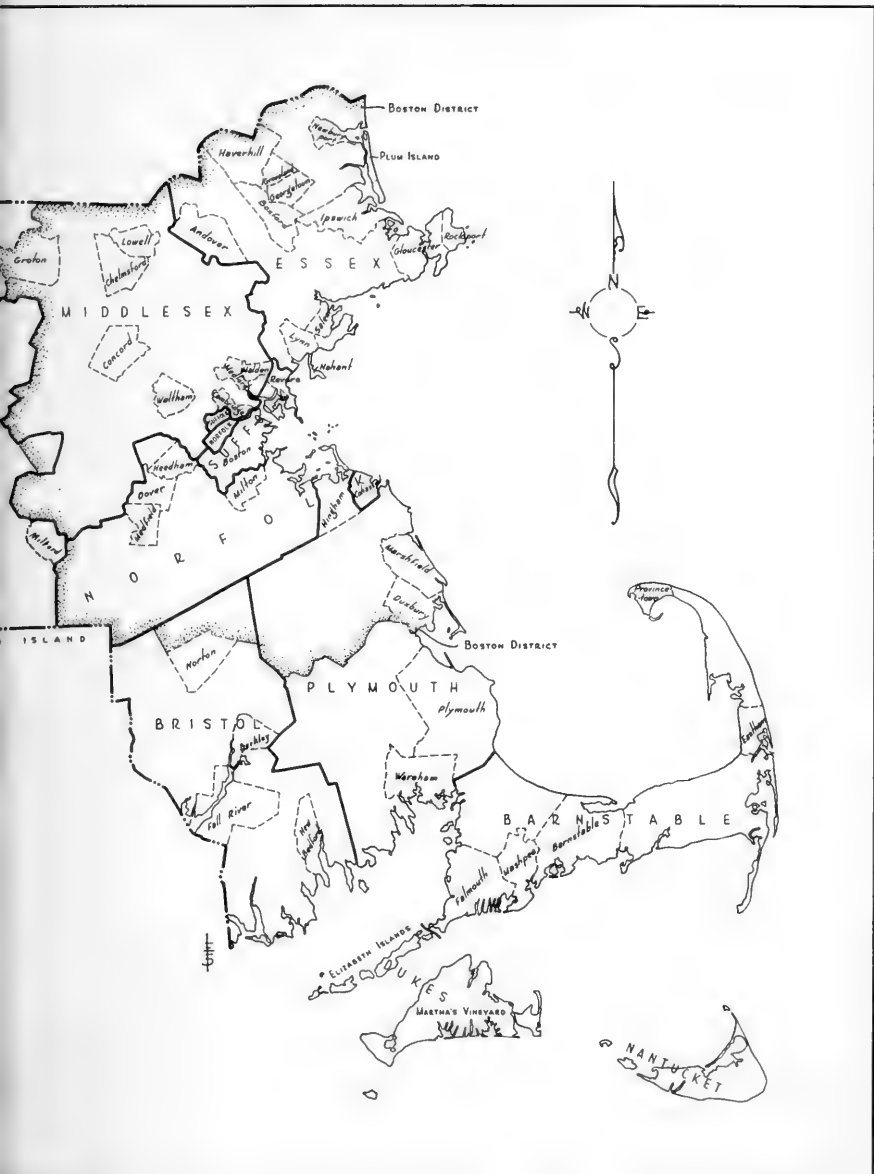
1929. *Goodale, Alfred S., compiler.* A check list of Pteridophyta and Spermatophyta (fern allies and seed-plants) occurring in the Connecticut River watershed in Massachusetts, 72, 5 p. *Amherst: author.*
Unannotated list of vascular plants. Hampshire and Franklin Counties, and parts of Hampden, Worcester and Berkshire Counties. Successor to the "Amherst floras."
1930. *Cunningham, Floyd F.* The relation of forest invasion and succession to the major soil types of the central Massachusetts upland. *Clark Univ. Thesis Abstracts (for 1930) 2:17-21.*
Forest types, based on quadrat analyses of 5 soil series.
1932. *Goodale, Alfred S., compiler.* A check list of Pteridophyta (ferns) occurring in the Connecticut River watershed in Massachusetts, 7 p., index. *Amherst: author.*
Unannotated list of ferns. Same area as Goodale 1929.
1934. [*Mass. Forest and Park Assoc.*] Guide to the Berkshires to the Capes Bridle Trail, 101 p., 12 maps. *Boston: Mass. Forest and Park Assoc.*
Description of the trail (since abandoned), with comments on the local vegetation.
1935. *Bromley, Stanley W.* The original forest types of southern New England. *Ecol. Monogr.* 5:61-89, 8 f.
Interpretation of the pre-colonial forests, emphasizing the importance of frequent fires. With maps of the principal forest regions, and of the locations of certain forest types.
1937. *Raup, Hugh M.* Recent changes of climate and vegetation in southern New England and adjacent New York. *Arnold Arboretum Journ.* 18:79-117.
Interpretation of the pre-colonial oak-chestnut-hickory forests, in the light of evidence of a warmer and drier climate within the past 3000 years.
1939. *Wyman, Donald.* Salt water injury of woody plants resulting from the hurricane of September 21, 1938. *Arnold Arboretum Bull. Pop. Inform.* IV, 7:45-51, pl. 8-9.
Lists of plants according to degree of salt-water damage, based on data from Woods Hole, Falmouth, Newport (R. I.), and places along the Massachusetts north shore.
1940. *Egler, Frank E.* Berkshire Plateau vegetation, Massachusetts. *Ecol. Monogr.* 10:145-192, 5 f., 10 t.
Descriptions of upland communities of three vegetation zones. Eastern



MAP OF MASSACHUSETTS
 SHOWING LOCALITIES AT WHICH
 VEGETATION HAS BEEN DESCRIBED

SCALE





Boston District

Plum Island

ESSEX

MIDDLESEX

NORFOLK

PLYMOUTH

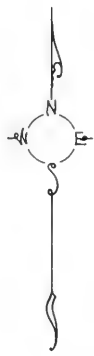
BRISTOL

BARNSTABLE

DUKES

MARTHA'S VINEYARD

NANTUCKET



Berkshire, western Franklin, western Hampshire and western Hampden Counties.

1940. *Raup, Hugh W.* Old field forests of southeastern New England. *Arnold Arboretum Journ.* 21:266-273.

Traces the division in eastern Massachusetts between zonal old-field types, and their corresponding general-upland forests.

1941. *Mass. W. P. A. Writers' Project.* State forests and parks of Massachusetts, a recreation guide, 58 p., illustr. *Boston: Massachusetts.*

Descriptions, and full-page detailed maps of each state forest and park.

1942. *Bain, Geo. Wm., and Howard A. Meyerhoff.* The flow of time in the Connecticut Valley, geological imprints, 129 p., 24 f., 10 pl. *Northampton: Hampshire Bookshop.*

Discussions of local geology; few vegetational comments.

AMHERST (Hampshire County)

1892. *Humphrey, J. E.* Amherst trees, an aid to their study, 78 p.

Amherst: Carpenter & Morehouse.

Descriptions of local kinds of trees.

1930. *Waugh, Frank A., and Chas. H. Thompson.* Hardy woody plants. *Mass. Agric. Exp. Sta. Bull.* 267:paged as 146-182.

Annotated list of trees and shrubs, presumably for the state, with comments on growth at Amherst.

1932. *Beaumont, A. B.* Experiments with permanent pastures. *Mass. Agric. Exp. Sta. Bull.* 281:36 p., 11 f., 19 t.

Describes some botanical changes in pasture communities, related to top dressings with commercial fertilizers.

ANDOVER (Essex County)

1901. *Pease, Arthur Stanley.* Some wild flowers of Andover with their dates of flowering together with a list of the ferns of Andover, 31 p.

Andover: School Dept.

Tables of flowering dates of herbs. Annotated list of ferns.

n.d. *Moore, A. H., and Arthur Stanley Pease.* List of plants introduced into Andover, Mass., in 1902, 7 p. *Andover: authors.*

Unannotated list of 104 species, transplanted from a garden into wild localities.

ASHBY (Middlesex County)

1906. *Howe, Reginald Huber.* Some lichens of Mt. Watatic, Massachusetts.

Bryologist 9:46-48.

Annotated list of 38 plants, collected on one day.

BARNSTABLE COUNTY

1865. *Thoreau, Henry David*. Cape Cod. Numerous editions.

A naturalist's account, with information of vegetational interest.

From Eastham to Provincetown.

1902. *Hollick, A*. Geological and botanical notes: Cape Cod and Chappaquidick Island, Mass. *N. Y. Bot. Garden Bull.* 2:381-407, 8 pl., map.

With unannotated list of 94 species, brief descriptions of the vegetation, and interpretation of the history.

1903. *Cowles, Henry Chandler*. Contrasts and resemblances between the sand dune floras of Cape Cod and Lake Michigan. *Science* 17(424):262 only.

Brief comments, without mention of specific species.

1912. *Sinnott, Edmund W*. The pond flora of Cape Cod. *Rhodora* 14:25-34.

General description of pond vegetation. Annotated list of species.

1914. *Knowlton, Clarence Hinckley*. The original flora of the old colony. *Rhodora* 16:113-116.

Collection of botanical notes from "Mount's Relation," 1622. Provincetown and Truro towns.

1920. *Brigham, Albert Perry*. Cape Cod and the old colony. *Geogr. Rev.* 10:1-22, 1 f.

Survey of human history and land-use. No direct vegetation data.

1921. *Harper, Roland W*. Cape Cod vegetation. *Torreyia* 21:91-98, 2 f.

Descriptive account of vegetation of entire Cape. Resume of preceding botanical studies.

1928. [*Mass. Forestry Assoc.*] The Cape Cod forest fire prevention experiment, 8 p., illustr. *Boston: Mass. Forestry Assoc.*

With comments on the vegetation, and fire relationships. Bourne, Falmouth, Sandwich, Mashpee, Barnstable and Yarmouth towns.

BARNSTABLE (Barnstable County)

1889. *Deane, Walter*. A few Cape Cod plants. *Bot. Gaz.* 14:45-47.

Popular treatment, selected seedplants; with vegetation notes.

1904. *Cheney, Clara Imogene*. Plants from Cape Cod; specimens collected mounted and catalogued by ..., 19 p. *Boston: author*.

Annotated list of over 300 vascular plants. Centerville.

BERKLEY (Bristol County)

1947. *Johnson, Frederick, and Hugh M. Raup.* Grassy Island, archaeological and botanical investigations of an Indian site in the Taunton River, Massachusetts. *Robt. S. Peabody Found. for Archaeology Papers* 1:viii, 68 p., 9 f., 3 t., 3 pl.

With description of present vegetation, and interpretation of history from Indian times. A brackish tidal-marsh.

1948. *Deevey, Edward S.* On the date of the last rise of sea level in southern New England, with remarks on the Grassy Island site. *Amer. Journ. Sci.* 246:351, 9 f.

Further interpretation of history, based on pollen analyses.

BERKSHIRE COUNTY

1829. *Dewey, Chester.* Catalogue of plants found in the county of Berkshire, Ms. *A history of the county of Berkshire*, by gentlemen in the county, clergymen and laymen, publ. at Pittsfield by Berkshire Assoc. of Congregational Ministers: 43-86.

Annotated list of vascular plants, including cryptogams.

1892. *Whipple, A. B.* The early botany of Berkshire. *Berkshire Book*, by its Historical and Scientific Society (Title on spine: *Berkshire Historical Society Collections, 1892*): 5-35 of second paging.

Quotations from old publications; recollections of vegetation; popular treatment of vegetation.

1901. *Adams, John Coleman.* Nature studies in Berkshire, viii, 225 p., 16 illustr. *New York: Putnam.*

With miscellaneous comments on vegetation.

1905. *Niles, Grace Greylock.* Hoosac Valley and its flowers and ferns. *Amer. Bot.* 9:1-7, 21-28, 2 frontisp.

Popular treatment of vegetation. Northern part of county.

1922. *Hoffmann, Ralph.* Flora of Berkshire County, Massachusetts. *Boston Soc. Nat. Hist. Proc.* 36:171-382.

Introduction treats vegetation. Annotated list of 1656 vascular plants, with some keys.

1939. *Wallace, G. J.* Some recent additions to the flora of Berkshire County, Massachusetts. *Rhodora* 41:128-130.

Seven additions, with annotations, from Lenox Sanctuary.

1942. *Wallace, G. J.* More Berkshire plants. *Rhodora* 44:332-334.

Ten additions, with annotations, from Lenox Sanctuary.

1948. *Simpson, A. Kenneth.* With what the hills are clothed. *The Berkshires, the purple hills*, ed. by Roderick Peattie, publ. at New York by Vanguard: 31-74, 2 pl.

A naturalist's account of interesting plants. Few data on vegetation.

BOSTON (Suffolk County)

1835-36. *Kenrick, E. B.* Beautiful plants growing wild in the vicinity of Boston. *Hovey's Mag. Hort.* 1 (for 1835): 368-377, 411-418, 453-458; 2 (for 1836): 55-57, 131-134, 171-174.

Popular treatment of selected seedplants, with comments on local occurrences.

1908. *Rich, Wm. Penn.* City botanizing. *Rhodora* 10:149-155.

Popular treatment of selected plants.

1910. *Davis, Chas. A.* Salt marsh vegetation near Boston and its geological significance. *Econ. Geol.* 5:623-639.

Primarily physiographic. Treats major plant communities.

1930. *Palmer, Ernest J.* The spontaneous flora of the Arnold Arboretum. *Arnold Arboretum Journ.* 11:63-119, Pl. 21.

Annotated list of 610 vascular plants. Introduction treats vegetation.

1935. *Palmer, E. J.* Supplement to the spontaneous flora of the Arnold Arboretum. *Arnold Arboretum Journ.* 16:81-97.

173 additions, with annotations.

1947. *Palmer, E. J.* Second supplement to the spontaneous flora of the Arnold Arboretum. *Arnold Arboretum Journ.* 28:410-418.

Additions, with annotations, bringing total to about 930 plants.

1935. *Jack, John G.* Winter injuries among trees and shrubs. *Sci. Mo.* 40:332-338.

Damage to cultivated woody plants, 1933-34, Arnold Arboretum.

1939. *Wyman, Donald.* The order of bloom of trees and shrubs at the Arnold Arboretum. *Arnold Arboretum Bull. Pop. Inform.* 7:53-64.

Chronologic list, arranged according to time of full bloom.

1940. *Wyman, Donald.* Map of the Arboretum. *Arnold Arboretum Bull. Pop. Inform.* 8:21-24, Pl. 3, folded map.

Includes map, and comments upon it.

[1949.] [*Arnold Arboretum.*] Through the Arnold Arboretum, 46 p., illustr., map. Boston: Arnold Arboretum.

Descriptive general literature.

"BOSTON DISTRICT" (see map)

1814. *Bigelow Jacob.* Florula bostoniensis, a collection of plants of

- Boston and its environs, 268 p. *Boston: Cummings and Hilliard.*
- A botanical manual of vascular plants, with local annotations.
1824. 2nd ed. ("vicinity" replaces "environs" in title), 423 p.
1840. 3rd ed. ("vicinity" replaces "environs" in title), 468 p.
1847. *Russell, John Lewis.* Musci of eastern Massachusetts. *Boston Nat. Hist. Journ* 5 (for 1845-47):172-188.
Annotated list. "Vicinity of Boston."
- 1876-1878. *Farlow, W. G.* List of fungi found in the vicinity of Boston. *Bussey Inst. Bull.* 1 (for 1876):430-439; 2(for 1878):224-252.
Mainly an annotated list. Woods Hole to Eastport, Maine.
1881. *Robinson, John.* Date of flowering of trees and shrubs in eastern Massachusetts, 1880. *Mass. Hort. Soc. Trans.* 1880:161-173.
Chronologic unannotated list, chiefly Arnold Arboretum and Cambridge Botanic Gardens, and elsewhere in Essex County.
1882. *Robinson, John.* Date of flowering of trees and shrubs in eastern Massachusetts, 1881. *Mass. Hort. Soc. Trans.* 1881:348-358.
Chronologic unannotated list, no exact locality.
1885. *Pease, Cora E.* The treasures of the fells. *Outing* 7:175-181.
Popular treatment of plants at Middlesex Fells, northwest of Boston.
1896. *Deane, Walter.* Flora of the Blue Hills, Middlesex Fells, Stony Brook and Beaver Brook Reservations of the Metropolitan Park Commission. Massachusetts, viii, 144 p., folded maps. *Boston: Barrows.*
Annotated list, including cryptogams.
1902. *Clark, Arthur.* A few plants of the Blue Hills Reservation. *Rhodora* 4:74-76.
Additions, and annotations on other plants.
1908. *Howe, Reginald Huber.* Two additions to the lichen flora of the Blue Hills. *Rhodora* 10:35-36.
Additions, with annotations.
1897. *Bacon, Edwin M.* Walks and rides in the country round about Boston covering thirty-six cities and towns, parks and public reservations, within a radius of twelve miles from the stwte house, 419 p., index, 4 folded colored maps, illustr. *Boston & New York: Houghton Mifflin.*
Reprint: Walks and rides in the country round about Boston, in 5 separate parts, boxed, with maps, without index, 1900.
Includes comments on vegetation.
1898. *Eliot Chas.* Vegetation and scenery in the metropolitan reservations of Boston, a forestry report written by ... and presented to the Metropolitan Park Commission, Feb. 15, 1897, by Olmsted, Olmsted and Eliot, 23 p. 57 pl., 3 f., maps. *Boston, New York, London: Lamson, Wolfe.*
Popular treatment of major vegetation types.

1902. *Locke, Elsie.* Flower talk in the Boston reservations. *New England Mag.* 26:259-267, illustr.

Popular treatment of plant life of Middlesex Fells and Blue Hills, arranged according to season of flowering.

1907-1929. *New England Botanical Club committee.* Reports on the flora of the Boston district. *Rhodora* 9 (1907):81-86; 10(1908):59-64, 128-131; 11(1909):75-80, 179-180, 204-209; 12(1910):3-7, 95-99; 13(1911):27-29, 72-73, 82-85, 104-105, 232-235, 248-251; 14(1912):76-78, 107-113; 15(1913):54-59, 122-132, 144-151; 16(1914):106-113; 17(1915):169-180, 202-203; 18(1916):86-90, 165-168, 213-221, 248-252; 20(1918):15-18, 55-59, 164-171, 208-209; 21(1919):78-83, 125-128; 22(1920):72-75, 123-127; 23(1921):113-118; 24(1922):92-95, 152-156, 231-236; 25(1923):25-31, 37-43, 60-67, 185-187; 26(1924):13-19, 34-36, 55-60, 82-88, 107-111, 130-132, 149-152, 166-168; 31(1929):41-43.

Annotated list of 2500 vascular plants. A modern treatment; published in 51 parts, exemplifying for all time the value of such publication for bibliographers, librarians, and botanists using this type of list.

1910. *Davis, C. A.* Salt marsh vegetation near Boston, and its geological significance. *Econ. Geol.* 5:623-639.

Mainly studies of peat sections. "Practically all of the salt marshes in the Boston and Boston Bay quadrangles were examined."

1943. *Lyon, C. J.* Water supply and the growth rates of conifers around Boston. *Ecology* 24:329-344.

Correlations of annual increment with precipitation, hemlock and white pine.

[1945.] *Knowlton, Clarence Hinckley.* The earliest spring flowers. *South Shore Nature Club Leaflet* 3: 2 p.

Popular phenologic treatment of selected plants. Eastern Norfolk and northern Plymouth Counties.

1947. *Leopold, A. C.* Distribution of red cedar in eastern Massachusetts. *Rhodora* 49:172-175, 3 f.

Distribution of red-cedar old-fields in an area 17 x 19 miles, on the zone boundary of Raup 1940, and correlations with cold-weather isotherms.

1949. *Knowlton, Clarence Hinckley.* Plant societies of southeastern Massachusetts, 10 p. *Hingham & Cohasset: South Shore Nature Club.*

Popular treatment of vegetation.

BOXFORD (Essex County)

1876. [*Perley, Mary Ellen.*] Flora of Boxford. *Georgetown Advocate (newspaper)* 2(22, 24).

Unannotated list of seedplants.

1897. *Alcott, Wm. Penn.* Botanical notes. *Essex Inst. Bull.* 27 (for 1895):92-94.

Unannotated list and popular treatment of selected seedplants.

CAMBRIDGE (Middlesex County)

1861. [*Higginson, Thomas Wentworth.*] April days. *Atlantic Monthly* 7: 385-394.

Popular treatment of phenologic data.

1862. *Higginson, Thomas Wentworth.* Procession of the flowers. *Atlantic Monthly* 10:649-657.

Popular treatment of phenologic data. Probably Cambridge.

1924. *Fernald, Merritt Lyndon*, comp. Key to the families of spring-flowering plants of eastern Massachusetts, 12 p. *Cambridge: Harvard Univ.*

A dichotomous key, "distinguishing the principal families of flowering plants available about Cambridge in April and May."

1939. *Ames, Oakes I.* Survey of hurricane damage at Mount Auburn cemetery, Cambridge, Mass. *Arborist's News* 4: [5-6], 1 t.

Tabular data on 4315 damaged trees of more than 34 kinds.

CHELMSFORD (Middlesex County)

1881. *Alcott, Wm. Penn.* Introduced plants found in the vicinity of a wool-scouring establishment. *Essex Inst. Bull.* 13:162-166.

Annotated list of 36 seedplants. North Chelmsford.

1917. *Knowlton, Clarence Hinckley.* The botany of Chelmsford. *Wilson Water's History of Chelmsford*, publ. at Chelmsford by the town: 651-655.

Popular treatment of vegetation and flora.

COHASSET (Norfolk County)

1898. [*Collier, Priscilla Lathrop.*] Botany of Cohasset. Edwin Victor Bigelow's *A Narrative history of the town of Cohasset, Massachusetts*, publ. at Boston by Usher: 541-552.

Unannotated list of vascular plants, including fungi.

CONCORD (Middlesex County)

1881. *Thoreau, Henry David.* Early spring in Massachusetts, from the journal of ..., 354 p., frontisp. *Boston: Houghton Mifflin.*

A naturalist's diary, with information concerning vegetation.

1899. [*Hosmer, Alfred W.*] On the plants introduced by Minot Pratt at

Concord, Massachusetts. *Rhodora* 1:168-172.

Two annotated lists, reporting success or failure with 20-year-old naturalization experiments.

1913-1915. *Howe, Reginald Huber*. The foliaceous and fruticose lichens of Concord, Massachusetts, with keys to all New England species. *Thoreau Mus. Nat. Hist. Proc.* 1(1913):27-29; 1(1914):30-32; 1(1915):37-40.

Botanical descriptions of families and genera; keys to species.

1918. *Brewster, Wm.* Exotic plants established in Middlesex County, Massachusetts. *Rhodora* 20:204-205.

Naturalization of two species in an old field.

DEERFIELD (Franklin County)

1818. *Williams, Stephen Wells*. Floral calendar kept at Deerfield, Massachusetts, with miscellaneous remarks. *Amer. Journ. Sci.* 1:359-373.

Chronologic treatment, for 1811, 1812, and 1818.

DOVER (Norfolk County)

1897. *Smith, Frank*. Flora, weeds, sylvia, shrubs and vines, ferns. His *A history of Dover, Massachusetts, as a precinct, parish, district, and town*, publ. at Dover by the town: 324-335.

Unannotated lists of plants.

DUXBURY (Plymouth County)

1912. *Knowlton, Clarence Hinckley*. Notes on the flora of Duxbury, Massachusetts. *Rhodora* 14:18-22.

With popular treatment of the vegetation.

1912. *May, J. B.* Further notes on the flora of Duxbury, Massachusetts. *Rhodora* 14:90-91.

Recent changes in abundance of certain plants. Naturalization of *Quercus robur*.

EASTHAM (Barnstable County)

1909. *Collins, Frank Shipley*. Notes of the flora of lower Cape Cod. *Rhodora* 11:125-133.

Popular treatment of vegetation.

1910. *Collins, Frank Shipley*. Flora of lower Cape Cod; supplementary note. *Rhodora* 12:8-10.

Further treatment of vegetation.

1911. *Collins, Frank Shipley*. Flora of lower Cape Cod; third note.

Rhodora 13:17-22.

Further treatment of vegetation, especially sporadic species.

1915. *Collins, Frank Shipley*. November flowers. *Rhodora* 17:33-38.
Phenologic data for 92 species.

ELIZABETH ISLANDS (Dukes County)

1874. *Jordan, D. S.* The flora of Penikese Island. *Amer. Nat.* 8:193-197.
Unannotated list of plants, including cryptogams.
1901. *Hollick, Arthur*. A reconnaissance of the Elizabeth Islands.
N. Y. Acad. Sci. Annals 13:387-418, Pl. 8-15.
With general comments on vegetation.
- n.d. *Northrop, Alice R.* Notes on the flora of Nashuina Island, 24 p.
Ms. in Gray Herbarium, Harvard Univ.
Popular treatment of vegetation. Annotated list of 335 plants, including cryptogams. Post-1903.
1905. *Forbes, Sarah Swain*. The botany of Naushon, 114 p. *Boston:author*.
Taxonomic treatment of species, with popular comments, but no local annotations.
1915. *Roberts, Edith A.* The distribution of beach plants. *Bot. Gaz.* 60:406-411.
Descriptive account of beach and cliff vegetation.
1924. *Lewis, Ivey F., et al.* The flora of Penikese, fifty years after. *Rhodora* 26:181-195 and map, 211-219, 222-229, Pl. 146-147.
Introduction on vegetation. Annotated list of plants, including cryptogams.
1930. *Fogg, J. M.* The flora of the Elizabeth Islands, Massachusetts. *Rhodora* 32:119-132 and map, 147-161, 167-180, 208-221, 226-258, 263-281.
Introduction on vegetation. Annotated list of over 500 vascular plants.
1948. *Doty, Maxwell S., et al.* The flora of Penikese, seventy-four years after. I, by *Maxwell S. Doty*, Penikese Island marine algae, *Rhodora* 50:253-269. II, by *Hannah Croasdale*, Fresh and brackish water algae of Penikese Island, *Rhodora* 50:269-279. III, by *Eliz. R. Dearden*, Penikese Island fungi, *Rhodora* 50:285-288. IV, by *Edwin T. Moul*, Flora of Penikese Island, *Rhodora* 50:288-304.
Annotated lists and comments on vegetation.

ESSEX COUNTY

1854. *Osgood, Geo.* [List of plants collected from March 25 to November

27, 1853, principally from North Danvers, with a few from Pleasant Pond, Wenham.] *Salem Gazette (newspaper) 1854 (42,44)*.

Unannotated list of seedplants, arranged according to date of blooming. Principally Danvers and Wenham towns.

1856. *Oakes, Wm.* *Collectanea botanica, or notices of rare plants found in Essex county, Massachusetts. Essex Inst. Proc. 1(for 1848-1856): 271-273.*

Annotated list of 25 seedplants.

1858. *Tracy, Cyrus Mason.* *Studies of the Essex flora; a complete enumeration of all plants found growing naturally within the limits of Lynn, Mass., and the towns adjoining...*, 88 p. *Lynn:author.*

Annotated list of seedplants.

1892. 2nd ed. *Studies of the Essex flora*, 99 p, *Lynn:Nichols.*

Annotated list of seedplants. Southwestern Essex County.

1862. [*Buttrick, Samuel Bartlett.*] *Calendar of spring for 1855 [and]...* 1856. *Essex Inst. Proc. 2(for 1856-1860):172-174.*

Unannotated list of selected seedplants, arranged chronologically. Southern Essex County.

1875-1877. *Robinson, John.* *Ferns of Essex county, Mass. Essex Inst. Bull. 7(1875):44-54, 147-148; 9(1877):98.*

Annotated list.

1879. *Robinson, John.* *Notes on the native and extensively introduced woody plants of Essex County, Massachusetts. Essex Inst. Bull. 11:72-106.* Reprint: 38 p., 1 pl., *Salem, Essex Inst.*

Annotated list.

1880. *Robinson, John.* *Notes on the flora of Essex County, Massachusetts, with sketches of the early botanists, and a list of the publications on these subjects. Essex Inst. Bull. 12:81-97.*

Annotations on selected species. Bibliography. Article reprinted in his 1880 flora.

1880. *Robinson, John.* *The flora of Essex County, Massachusetts*, 200 p. *Salem: Essex Inst.*

Introduction on vegetation. Annotated list of 1834 plants, including cryptogams. Bibliography.

1883. *Paine, Harriet Eliza.* *Groveland plants not reported by Mr. Robinson in his county flora. Essex Inst. Bull. 15:134.*

Additional seedplants, with annotations.

1883. *Sears, John H.* *Weeds of Essex County. Essex Inst. Bull. 15:93-104.*

Annotated list of selected plants, including cryptogams.

1885. [Robinson, John.] The native woods of Essex County, Massachusetts Extract from "Report on forests of North America" by Prof. Chas. S. Sargent, vol. 9, of "Reports of the Tenth Census of the U.S." *Peabody Acad. Sci. Repts. for 1884:103-107*, 3 t.

Mainly physical properties of woods. Few local vegetation data.

1891. Robinson, John. Our trees; a popular account of the trees in the streets and gardens of Salem, and the native trees of Essex county, Massachusetts, with the location of the trees and historical and botanical notes, 120 p. Salem: *Essex Inst.*

Popular treatment of selected trees.

1900. Huntington, J. W. Some uncommon mosses in northern Essex county, Massachusetts. *Rhodora* 2:95-97.

Comments on selected species.

FALL RIVER (Bristol County)

1913. Cook, H. O. Some original data on waterflow and forests. *Harvard Forestry Club Bull.* 2:38-42.

Conclusions on relation of forests to streamflow. Watershed of North Watuppa Pond.

FALMOUTH (Barnstable County)

1901. Clark, Hubert Lyman. Notes on the flora of Woods Hole, Massachusetts. *Rhodora* 3:87-89.

Annotations on 17 selected plants.

1902. Shaw, Chas. H. The development of vegetation in the morainal depressions of the vicinity of Woods Hole. *Bot. Gaz.* 33:437-450, 6 f.

Vegetation development traced from open water. Presents a theory on the marginal ditch.

1904. Kearney, T. H. Are plants of sea beaches and dunes true halophytes? *Bot. Gaz.* 37:424-436.

Environment analyses, with data from Woods Hole.

1905. Chrysler, M. A. Reforestation at Woods Hole, Massachusetts - a study in succession. *Rhodora* 7:121-129, 4 f., Pl. 62-63.

Description of a tract bare in 1850, now forested, with plantings decadent and natural oak reproduction; and a salt-spray scrub.

1909. Barlett, H. H. The submarine *Chamaecyparis* bog at Woods Hole, Massachusetts. *Rhodora* 11:221-235, 1 pl., 1 t., 1 map.

Description of tidal-marsh overlying *Chamaecyparis* bog.

1913. Davis, B. W. General characteristics of the algal vegetation of

Buzzards Bay and Vineyard Sound in the vicinity of Woods Hole. *U.S. Dept. Commerce and Labor Bur. of Fisheries Bull.* 31:443-544.

With description of algal communities of tidal marsh pools.

1913. *Davis, B. W.* A catalogue of the marine flora of Woods Hole and vicinity. *U.S. Dept. Commerce and Labor Bur. of Fisheries Bull.* 31: 795-833.

Annotated list, mainly algae and fungi. Buzzards Bay and part of Vineyard Sound.

1915. *Roberts, Edith A.* The distribution of beach plants. *Bot Gaz.* 60: 406-411.

Descriptive account of beach and cliff vegetation.

FITCHBURG (Worcester County)

1885. *Simonds, Arthur Beaman, et al.* Catalogue of the phaenogamous and vascular cryptogamous plants of Fitchburg and vicinity, 39 p. *Fitchburg: Fitchburg Agassiz Assoc.*

Unannotated list of 816 plants.

FRANKLIN COUNTY

1910. *Williams, Emile F.* Notes on the flora of Franklin County, Massachusetts. *Rhodora* 12:168-170.

Popular treatment of selected species.

1913. *Stone, Geo. Edward.* A list of plants growing without cultivation in Franklin, Hampshire and Hampden Counties, vii, 72 p. *Amherst:author.*

List of 1493 vascular plants, with few annotations.

1923. *Averill, R. C., W. B. Averill, and W. I. Stevens.* A statistical forest survey of seven towns in central Massachusetts. *Harvard Forest Bull.* 6: 1 f., 18 t.

Timber survey of eastern Franklin County and northwestern Worcester County, with vegetation data.

1935. *McKinnon, F. S., G. R. Hyde, and A. C. Cline.* Cut-over old field pine lands in central New England, a regional study of the composition and stocking of the ensuing volunteer stands. *Harvard Forest Bull.* 18: 80 p., 12 f., 9 t.

Composition and density in relation to site and age. Northern Worcester, eastern Franklin, and Cheshire (New Hampshire) Counties.

GEORGETOWN (Essex County)

1876. [*Horner, Charlotte N. S.*] Flora of Georgetown. *Georgetown Advocate (newspaper)* 2(20, 23, 25, 29, 32).

Unannotated list of seedplants.

1884. *Horner, Charlotte, N. S.* Notes on the flora of South Georgetown. *Essex Inst. Bull.* 15:107-110.

Annotated list of vascular plants.

GLOUCESTER (Essex County)

1864. *Markoe, Geo. F. H.* Catalogue of plants. *Essex Inst. Proc.* 3(for 1860-63):24-27.

Unannotated list of selected vascular plants.

1898. *Farlow, W. G.* Botany: marine algae. A. W. Grabau and J. E. Woodman's *Guide to localities illustrating the geology, marine zoology and botany of the vicinity of Boston*, publ. at Boston by Amer. Assoc. *Adv. Sci.* 97-100.

Description of marine algae at Nahant, and at Magnolia (Gloucester town).

1944. *Dexter, Ralph W.* Ecological significance of the disappearance of eel-grass at Cape Ann, Massachusetts. *Journ. Wildlife Management* 8: 173-176.

General description, including effects on other biotic communities, 1931-40.

1944. *Dexter, Ralph W.* The bottom community of Ipswich Bay, Massachusetts. *Ecology* 25:352-359.

Primarily zoologic; includes description of algal communities.

1945. *Dexter, Ralph W.* A report on the eelgrass situation in the Annisquam (Massachusetts) and Mystic (Connecticut) tidewater rivers in the summer of 1945. *U.S. Dept. Agric. Plant Disease Reporter* 29:702-704.

Records of living colonies of eelgrass and of *Ruppia*.

1946. *Dexter, Ralph W.* The eelgrass situation in the Annisquam (Massachusetts) and Mystic (Connecticut) tidewater rivers in the summer of 1946. *U.S. Dept. Agric. Plant Disease Reporter* 30:424-425.

Further records of increased abundance of eelgrass.

1947. *Dexter, Ralph W.* Status of eelgrass in the Annisquam tidal river and Menemsha saltwater pond in Massachusetts during the summer of 1947. *U.S. Dept. Agric. Plant Disease Reporter* 31:448-449.

Further records of increased abundance of eelgrass.

1947. *Dexter, Ralph W.* The marine communities of a tidal inlet at Cape Ann, Massachusetts: a study in bio-ecology. *Ecol. Monogr.* 17:261-294, 17 f., 11 t., maps.

A monographic study, mainly zoologic.

GREYLOCK RESERVATION (Berkshire County)

- 1902-1909. *Andrews, A. LeRoy.* A list of bryophytes from the Mt. Greylock region. *Rhodora* 4(1902):29-31, 238-243; 6(1904):72-75; 11(1909):116-118.
First list unannotated. Subsequent lists of annotated additions.

GROTON (Middlesex County)

1912. [*Hill, Eliz. Sewall.*] Flora. Samuel Abbott Green's *The natural history and the topography of Groton, Massachusetts* (Title on spine: *Facts relating to the history of Groton, Massachusetts*), publ. at Cambridge by Wilson:1-26.

Annotated list of vascular plants (no sedges and grasses), with flowering dates.

GROVELAND (Essex County)

1883. *Paine, Harriet Eliza.* Plants shown at the meeting in Groveland, Mass., August, 1883. *Essex Inst. Bull.* 15:133.
Plants seen on a field trip.

HADLEY (Hampshire County)

1905. *Judd, Sylvester.* History of Hadley..., Massachusetts, 205 p., illustr. *Springfield: Huntting.*
See pp. 426-429 for popular botanic treatment, including a north-south cross-section of Mt. Holyoke, with description of forest belts.

HAMPDEN COUNTY

1913. *Stone, Geo. Edward.* A list of plants growing without cultivation in Franklin, Hampshire and Hampden Counties, 72 p. *Amherst: author.*
List of 1493 vascular plants, with few annotations.

HAMPSHIRE COUNTY

1913. *Stone, Geo. Edward.* A list of plants growing without cultivation in Franklin, Hampshire and Hampden Counties, 72 p. *Amherst: author.*
List of 1493 vascular plants, with few annotations.

1914. *Roberts, Edith A.* The plant successions of the Holyoke Range. *Bot. Gaz.* 58:432-444, map.
Description of the vegetation and its development.

1920. *Fisher, Richard T., and E. I. Terry.* The management of second growth white pine in central New England. *Journ. For.* 18:358-366.
General conclusions, based on practice at Petersham and on observations of 54 areas in Cheshire (New Hampshire), Hampshire and northern Worcester Counties.

HAVERHILL (Essex County)

1924. *Bartlett, Mira W.* Ferns. *Haverhill Publ. Libr. Bull.* 8:17-20.
Popular treatment, with list of local pteridophytes.
1925. *Bartlett, Mira W.* A partial list of the wild flowers found growing in the thirty-two square miles comprised in the city of Haverhill. *Haverhill Publ. Libr. Bull.* 8:61-76.
Unannotated list of selected seedplants.

HINGHAM (Plymouth County)

1868. [*Lewis, James S.*] Forest trees and shrubs of Hingham. *Abstract of returns of the agricultural societies of Massachusetts, 1867* (Title on spine: *Agriculture of Massachusetts by C. L. Flint, second series, 1867-8*):109-115.
Annotated list of 22 plants.
1893. *Bouvé, Thomas Tracy.* The botany of Hingham, Massachusetts. *History of the town of Hingham, publ. at Cambridge by the town, 1 (Pt. 1)*: 87-138.
List of vascular plants, with few annotations.
1893. *Bouvé, Edward T.* The trees and shrubs of Hingham, Massachusetts. *History of the town of Hingham, publ. at Cambridge by the town, 1 (Pt. 1)*: 139-156, 3 pl.
Annotated list of about 250 plants.
1924. *Knowlton, Clarence Hinckley.* Notes on the plants of Hingham, Massachusetts. *Rhodora* 26:175-177.
Comments on localities and occurrences; additions to the 1893 lists.

IPSWICH (Essex County)

1785. *Cutler, Manasseh.* An account of some of the vegetable productions naturally growing in this part of America, botanically arranged. *Amer. Acad. Arts Sci. Memoirs* 1:396-493.
Annotated list of plants.
1841. *Oakes, Wm.* On the advance of spring in eastern part of Massachusetts. *Hovey's Mag.* 7:201-208, 2 t.
Phenologic data, based on records of 16 years.
1913. *Townsend, C. W.* Sand dunes and salt marshes, ix, 311 p. illustr. Boston: Page. 2nd ed., 1925.
Naturalist's account of vegetation, flora and topography.

HOLDEN (Worcester County)

1934. *Mass. Conf. on Land Economic Survey*. Summarized sample survey of natural resources based on the town of Holden and vicinity, 16 p., maps. Boston: *Mass. Forest and Park Assoc.*

With maps showing soil types, geology, land utilization, and forest types. "Forest survey", pp. 7-8, by Richard T. Fisher.

HUBBARDSTON (Worcester County)

1837. *Russell, John Lewis*. Notice of some rare and beautiful plants found in Hubbardston, Mass., during the months of May, June, July, and August, 1837. *Hovey's Mag.* 3:410-413.

Popular treatment of selected species. Mainly Hubbardston, but also adjacent town to east.

LOWELL (Middlesex County)

1882. *Chase, Chas. Chauncy*. Flora of Lowell and vicinity. *Lowell Morning Mail (newspaper)* 1882 (Nov. 21).

Unannotated list of 456 vascular plants.

1904. *Bayles, James*. Local flora. *Lowell Weekly Journal* May 6, 13, 18, 27; June 3, 10, 17, 24; July 1, 6, 8, 20, 22; August 5.

Popular treatment of selected vascular plants.

LYNN (Essex County)

1862. [*Mudge, B. F.*] The salt marsh formations of Lynn. *Essex Inst. Proc. (for 1856-60)*:117-119.

Describes buried stumps and interprets past history. Lynn, and adjacent Saugus and Nahant towns.

1889. *Baxter, Sylvester*. The Lynn public forest.. *Garden and Forest* 2: 526-527.

With comments on vegetation, and history of land-use.

1893. [*Atwood, Luther.*] Plants and trees in Lynn Woods. *Fourth Annual Rept. Park Commissioners city of Lynn for year ending Dec. 20, 1892*: 17-24, map.

Unannotated list of vascular plants.

1898. *Atwood, Luther*. Plants and trees in Lynn Woods. *Tenth Annual Park Commission Rept., Lynn, Massachusetts, 1898*: 25-43.

Unannotated list of plants, including cryptogams.

1940. *Chapman, V. J.* Studies in salt marsh ecology. Sect. VI and VII. Comparison with marshes on the east coast of North America. *Journ.*

Ecol. 28:118-152.

With data from marshes at Lynn and adjacent Saugus.

1940. *Chapman, V. J.* Succession on the New England salt marshes. *Ecol.* 21:279-282, 4 f.

Based on survey of literature. With data from marshes at Lynn.

MALDEN (Middlesex County)

1881. [*Silvester, Hattie.*] A list of plants growing without cultivation in Malden and Medford, Mass., with some contributions to a flora of Middlesex County, 19 p. *Malden: Middlesex Inst.*

Unannotated list of about 700 plants, including cryptogams, arranged by month of flowering.

MARSHFIELD (Plymouth County)

1885. *Shaler, N. S.* Sea-coast swamps of the eastern United States. *U.S. Geol. Surv. 6th Ann. Rept. (for 1884-85):*353-398, F. 51-57.

With detailed description of Green Harbor River diked lands at Marshfield.

MARTHA'S VINEYARD (Dukes County)

1877. *Morong, Thomas.* The flora of Martha's Vineyard and vicinity. *Field and Forest* 3:119-124.

Popular treatment of selected flora and vegetation.

1885. [*Redfield, J. H.*] On the flora of Martha's Vineyard and Nantucket. *Phila. Acad. Nat. Sci. Proc.:*378-379.

Brief comments on abundant species.

1893. *Hollick, Arthur.* Observations on the geology and botany of Martha's Vineyard. *N. Y. Acad. Sci. Trans.* 13:8-22.

With comments on vegetation, and unannotated list of vascular plants.

1902. *Hollick, Arthur.* Geological and botanical notes: Cape Cod and Chappaquidick Island, Mass. *N. Y. Bot. Garden Bull.* 2:381-407, 8 pl., map.

With unannotated list of 94 species, brief descriptions of the vegetation, and interpretation of the history.

1931. *Meleney, Grace Coit.* Flora of the island, long list of plants collected here last July. *Vineyard Gazette (newspaper) August 7.*

Unannotated list of seedplants.

1947. *Dexter, Ralph W.* Status of eelgrass in the Annisquam tidal river and Menemsha saltwater pond in Massachusetts during the summer of 1947.

U.S. Dept. Agric. Plant Disease Reporter 31:448-449.

Further records of increased abundance of eelgrass. Western Mattha's Vineyard.

MASHPEE (Barnstable County)

1931. *Cook, H. O.* Original forests of Cape Cod. *Journ. For.* 29:422-423.
Description of forest vegetation of two islands in Halfway Pond (Plymouth town) and Wakeby Lake (Mashpee town).

MEDFIELD (Norfolk County)

n.d. *Knowlton, Clarence Hinckley.* Flora of Rocky Woods Reservation, Massachusetts, 11 p., map on cover. [*Boston: Trustees of Public Reservations.*]

Popular treatment of vegetation. Unannotated list of species. Bulletin received November 1949.

MEDFORD (Middlesex County)

- 1875-76. *Davenport, Geo. E.* Flora of Medford. *Medford Chronicle (newspaper)* 13 parts.

Popular treatment of selected vascular plants.

1881. [*Silvester, Hattie.*] A list of plants growing without cultivation in Malden and Medford, Mass., with some contributions to a flora of Middlesex County, 19 p. *Malden: Middlesex Inst.*

Unannotated list of about 700 plants, including cryptogams, arranged by month of flowering.

MIDDLESEX COUNTY

1886. *Lawrence, Rosewell B.* Middlesex Fells. *Appalachia* 4:199-214, Pl. 5 (folded map).

General description. Mainly Medford and Stoneham towns.

1888. *Dame, Lorin L., and Frank Shipley Collins.* Flora of Middlesex County, Massachusetts, xix, 201 p., map. *Malden: Middlesex Inst.*

Annotated list of 2061 plants, including cryptogams.

1899. *Cook, Mable Priscilla.* Some additions to the "Flora of Middlesex County, Massachusetts." *Rhodora* 1:80-82.

Annotations to new and old species.

1899. *Smith, Ernest C.* Further additions to the flora of Middlesex County, Massachusetts. *Rhodora* 1:97-98.

Annotations for 23 additions, mainly Framingham town.

1899. *Hosmer, Alfred W.* Further additions to the flora of Middlesex County, Massachusetts. *Rhodora* 1:223-224.

Annotations for additions, mainly Concord town.

1906. *Howe, Reginald Huber*. Some additions to the flora of Middlesex county, Massachusetts. *Bryol.* 9:81-82.

Annotated list of 24 bryophytes.

1892. *Lawrence, Rosewell B.* Middlesex Fells. *Appalachia* 6:322-326, Pl. 6 (folded map).

General description.

1947. *Eaton, Richard J.* *Lemna minor* as an aggressive weed in the Sudbury River. *Rhodora* 49:165-171, 1 t.

Popular treatment of vegetation changes, correlated with alkaline wastes.

MILFORD (Worcester County)

1882. *Ballou, Adin*. Vegetation and animality. His *History of the town of Milford, Worcester County, Massachusetts, from its first settlement to 1881*, publ. at Boston by the town: 23-25.

Popular treatment of vegetation, with consideration of origin of natural meadows.

MILLBURY (Worcester County)

1894. *Jackson, Joseph*. Through glade and mead, a contribution to local natural history, xiii, 332 p., 14 illustr. *Worcester: Putnam Davis*.

A naturalist's account, arranged by seasons, with lists of phenologic data. Appendix A, p. 253-320: "Flora of Worcester County, a catalogue of the phaenogamous and vascular cryptogamous plants of Worcester County, Massachusetts, 2 ed., rev. and enl.," a briefly annotated list of 1098 vascular plants. Appendix B, p. 321-328: "The trees, shrubs and evergreen flowering plants growing without cultivation in Worcester County," an unannotated list. Appendices also published separately by author, Worcester, 1894, under title of Appendix A, 76 p., 5 pl.

MILTON (Norfolk County)

1888. [*Churchill, J. R.* List of trees and plants growing naturally in Milton, Mass.] A. K. Teele's *The history of Milton, Massachusetts, 1640-1887*, publ. at Milton by the town: 592-613.

These pages include annotated lists of plants.

n.d. *Churchill, J. R.* List of trees and plants growing naturally in Milton, Mass., 16 p. *Milton: author*.

Annotated list of about 550 plants, apparently extracted from above.

MONTEREY (Berkshire County)

1931. *Stafford, Earle*. Skeleton planting. *Journ. For.* 29:41-47.

With description of old-field vegetation development. Area now part of Beartown State Forest.

MOUNT WASHINGTON (Berkshire County)

1901. *Britton, Eliz. G.* The rare mosses of Bashbish Falls. *Torreyia* 1: 9 only.

Popular treatment of selected species.

1919. *Knowlton, Clarence Hinckley.* An excursion to Mt. Washington, Massachusetts, and Bash-bish Falls. *Rhodora* 21:198-202.

Popular treatment of selected species and vegetation.

NAHANT (Essex County)

1862. *Tracy, C. M.* Noticeable traits of the flora of Nahant. *Essex Inst. Proc.* 2 (for 1856-60):272-277.

Popular treatment of selected species and vegetation. Interpretation of history since 1633.

1898. *Farlow, W. G.* Botany: marine algae. A. W. Grabau and J. E. Woodman's *Guide to localities illustrating the geology, marine zoology and botany of the vicinity of Boston*, publ. at Boston by Amer. Assoc. Adv. Sci.: 97-100.

Description of marine algae at Nahant, and at Magnolia (Gloucester town).

NANTUCKET COUNTY

1882. *Owen, Maria L.* Botany. E. K. Godfrey's *The island of Nantucket, what it was and what it is*, publ. at Boston by Lee & Shepart, publ. at N. Y. by Dillingham: 36-47.

Unannotated list of plants.

1885. [*Redfield, J. H.*] On the flora of Martha's Vineyard and Nantucket. *Phila. Acad. Nat. Sci. Proc.* 1885:378-379.

Brief comments on abundant species.

1888. *Owen, Maria L.* A catalogue of plants growing without cultivation in the county of Nantucket, Mass., 87 p. *Northampton: Gazette Printing.*

Introduction on vegetation. Annotated list of 788 plants, including cryptogams.

1894. *Wilder, Burt G.* Evidence as to the former existence of large trees on Nantucket Island. *Amer. Assoc. Adv. Sci. Proc.* 43: one page.

Comments on stumps in an old peat bog.

1901. *Smith, Sara Winthrop.* Nantucket, a brief sketch of its physiography and botany, 24 p. N. Y.: Knickerbocker Press.

Popular treatment of vegetation and of selected species.

1908. *Wilson, Anne.* Boggy solitudes of Nantucket, 118 p. N. Y. & Washington: Neale.
Naturalist's account of bog plants and vegetation.
- 1908-1919. *Bicknell, Eugene P.* The ferns and flowering plants of Nantucket. *Bull. Torrey Bot. Club* 35(1908):49-62, 181-201, 471-498; 36(1909):1-29, 441-456; 37(1910):51-72; 38(1911):103-133, 447-460; 39(1912):69-80, 415-428; 40(1913):605-624; 41(1914):71-87, 411-427; 42(1915):27-47, 331-349, 549-570; 43(1916):265-276; 44(1917):369-387; 45(1918):365-383; 46(1919):423-440.
Annotated list of 1136 plants.
1911. *Cushman, Jos. A.* Three additional plants from Nantucket. *Rhodora* 13:105.
Annotations on three additions.
1914. *Gardner, Grace Brown.* [The Nantucket flora.] Robt. Alexander Douglas-Lithgow's *Nantucket, a history, publ. at N. Y. & London by Putnam*:245-268.
Popular introductory treatment. Unannotated list of vascular plants, Latin names only.
1914. *Harshberger, John W.* The vegetation of Nantucket. *Geogr. Soc. Phila. Bull.* 12:70-79 (also paged as 24-33), 10 f., map.
Description of vegetation, with map of cover types.
1916. *McAtee, W. L.* The winter flora of Muskegat Island, Massachusetts. *Rhodora* 18:93-99.
Description of vegetation. Annotated list of 54 vascular plants.
1921. *Albertson, A. O.* Nantucket wild flowers, xlv, 422 p., illustr. New York: Putnam.
A manual of 300 species, well illustrated, with keys.
1930. *Jones, Bassett.* *Pinus thunbergii* on Nantucket. *Nat. Hort. Mag.* 9:181-190, illustr.
Naturalization of *P. thunbergii*, with other vegetation notes.
1935. *Jones, Bassett.* Was Nantucket ever forested? *Nantucket Historical Assoc. Proc.* 1935:19-28.
A consideration, with negative conclusion.
1942. *Rice, Mabel A.* The mosses and liverworts of Nantucket. *Bryol.* 45:115-124.
Popular treatment of vegetation. Unannotated list of 53 plants.
1946. *Rice, Mabel A.* Trees and shrubs of Nantucket; descriptions, identification keys, list of trees and shrubs, 77 pp, 1 pl. *Nantucket: Maria Mitchell Assoc.*
Lists, keys, descriptions, bibliography.

1948. *Griscom, Ludlow, and Edith V. Folger*. The birds of Nantucket, 156 p., illustr., map, index. *Cambridge: Harvard Univ. Press*.
With interpretation of vegetation changes in recent decades.

NEEDHAM (Norfolk County)

1878. *Higginson, Storrow, and Samuel B. Read*. Partial list of the flora of Needham and immediate vicinity, 9 p. *Needham: author*.
Unannotated list of 369 seedplants, with flowering dates.

NEW BEDFORD (Bristol County)

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NEWBURYPORT (Essex County)

1891. *Moulton, Edw*. Flora of this vicinity. *Newburyport Daily Standard (newspaper)* 32 articles.
Popular treatment of vascular plants.
1902. *Colman, Harriot W*. The trees of Newburyport, 32 p. *Newburyport: City Improvement Soc.*
Popular treatment of selected species.

NORTON (Bristol County)

1943. *Rice, Mabel A*. Bryophytes in the vicinity of Wheaton College, Norton, Massachusetts. *Bryol.* 46:66-71.
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OXFORD (Worcester County)

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89:533-535.

Inferences concerning effects of marsh gas. Grassy Pond.

PETERSHAM (Worcester County)

1911. *Jack, John G.* Trees and other woody plants found in the Harvard Forest, Petersham, Massachusetts. *Harvard Forestry Club Bull.* 1:10-26.
Annotated list of about 175 species.
1913. *Carter, E. E.* A volume table for red maple on the Harvard Forest. *Harvard Forestry Club Bull.* 2:1-8, 5 t.
Correlations of volume, height, DBH and other factors.
1913. *Kittredge, J.* Notes on the chestnut bark disease (*Diaportha parasitica*, Murrill) in Petersham, Mass. *Harvard Forestry Club Bull.* 2:13-22.
Details of state of infection in 1912.
1915. *Frothingham, E. H.* The northern hardwood forest: its composition, growth, and management. *U.S. Dept. Agric. Bull.* 285: 80 p.
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Natural development vs. silvicultural treatment in forests which follow clear-cutting.
1922. *Patton, Reuben T.* Red oak and white ash. *Harvard Forest Bull.* 4:38 p, illustr., 20 t.
Various growth data, Harvard Forest.
1922. *Peirson, H. B.* Mound-building ants in forest plantations. *Journ. For.* 20:325-336.
Killing of pines and of hardwoods in vicinity of mounds, Harvard Forest.
1927. *Marshall R.* The growth of hemlock before and after release from suppression. *Harvard Forest Bull.* 11:43 p., 10 f., 8 t.
Reconstruction of post-logging history at Petersham. Hemlock studies in northern Worcester County.
1928. *Fisher, Richard T.* Soil changes and silviculture on the Harvard Forest. *Ecology* 9:6-11, 1 f., Pl. 3.
Comments on various silvicultural conversions.
1930. *Griffith, B. G., E. W. Hartwell, and T. E. Shaw.* The evolution of soils as affected by the old field white pine mixed hardwood succession in central New England. *Harvard Forest Bull.* 15: 82 p., 7 f., 17 t.
Soil characteristics in relation to silvicultural conversions.

1930. *Hatt, Robt. T.* The relation of mammals to the Harvard Forest. *Roosevelt Wildlife Bull.* 5:625-671, F. 191-213.
Relationships of mammal species to tree species, especially exotic plantation trees.
1941. [*Harvard Forest.*] The Harvard Forest Models, 48 p., illustr. *Petersham: Harvard College.*
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1941. *Raup, H. M., and R. E. Carlson.* The history of land use in the Harvard Forest. *Harvard Forest Bull.* 20:64 p., 9 f. (maps).
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PLAINFIELD (Hampshire County)

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Chronologic data for selected species.
1821. *Porter, Jacob.* Floral and miscellaneous calendar for Plainfield, Mass. ... *Amer. Journ. Sci.* 3:273-284.
Chronologic data for selected species for 1819.

PLUM ISLAND (Essex County)

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With a detailed account of the marshes at Plum Island.
1947. *Carson, Rachel L.* Parker River, A National Wildlife Refuge.

U.S. Fish & Wildlife Service Conservation in Action 2: 14 p., illustr.
Popular treatment, with comments on the vegetation.

PLYMOUTH COUNTY

1901. *Parish, S. B.* The vegetation of Plymouth three hundred years ago. *Rhodora* 3:17.
Comments on a publication of 1602-1625.
1914. *Knowlton, Clarence Hinckley.* The original flora of the old colony. *Rhodora* 16:113-116.
Collection of botanical notes from "Mount's Relation" 1622. Plymouth Bay, and Middleboro north to Taunton River.
1918. *Morris, James J.* The forests of Plymouth County. The results of a forest survey of the twenty-seven towns in the county, 148 p., illustr., map. *Boston: Mass. State Forester.*
With data on types, size classes, etc., for each town.

PLYMOUTH (Plymouth County)

1904. *Hedge, Catherine Elliott.* Wild flowers of Plymouth and vicinity 1804-1904, 46 p., 2 pl. *Boston: author.*
Unannotated list of plants, including some cryptogams.
1931. *Cook, H. O.* Original forests of Cape Cod. *Journ. For.* 29:422-423.
Description of forest vegetation of two islands in Halfway Pond (Plymouth town) and Wakeby Lake (Mashpee town).

PROVINCETOWN (Barnstable County)

1904. *Westgate, J. M.* Reclamation of Cape Cod sand dunes. *U.S. Bur. Plant Industry Bull.* 65:38 p.
Vegetation, physiography and history of the dunes; and effects due to management practices.

REVERE (Suffolk County)

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Annotated list of 364 plants including cryptogams, from a 20-acre island.
1902. *Rich, Wm. Penn.* Oak island and its flora. *Rhodora* 4:87-94.
Popular treatment of seasonal aspects. Annotated additions to Young's list.
1920. *Wherry, E. T.* Plant distribution around salt marshes. *Ecol.* 1: 42-48.
Acidity tests on soils of different communities.

ROCKPORT (Essex County)

1873. *Leonard, Henry C.* Trees and flowers of Cape Ann. His *Pigeon Cove and vicinity*, publ. at Boston by Searle: 140-156.

Popular treatment of vegetation. Unannotated list of vascular plants.

RUSSELL (Hampden County)

1946. *Reynolds, Harris A.* The Russell Town Forest, a forest management plan. *Mass. Forest and Park Assoc. Bull.* 170: 8 p., illustr.

With comments on vegetation, and type map.

SALEM (Essex County)

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Popular treatment of selected vegetation and flora.

1862. *Buttrick, Samuel Bartlett.* [List of plants found in, and within seven or eight miles of Salem, 1857.] *Essex Inst. Proc.* 2 (for 1856-60): 233-242.

Unannotated list of seedplants, arranged by date of flowering.

1870. *Phippen, Geo. D.* "Dark Lane," with allusions to other localities of wild plants in Salem. *Essex Inst. Bull.* 2:97-104.

Comments on various localities, and past abundance of species, with unannotated lists.

1886. *Sears, John H.* List of native and introduced plants observed in flower in the vicinity of Salem, during the spring of 1886, on or before May 1. *Essex Inst. Bull.* 18:95-98.

Unannotated list of seedplants.

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Further comments on the publication of 1602-1625, indicating that Salem be credited, not Plymouth.

1926. *Robinson, J.* Plants growing the first season in an uncovered cellar. *Rhodora* 28:69-74.

List of 75 species, representing a pioneer community, in cellar of a burned church.

SHEFFIELD (Berkshire County)

1947. *Weatherby, C. A.* Bartholomew's Cobble. *Amer. Fern Journ.* 37:1-6, 1 f.

Popular treatment of selected flora and vegetation.

1948. *Bailey, S. Waldo.* Bartholomew's Cobble, 8 p., illustr. Boston: Trustees of Public Reservations.

Popular treatment of selected flora and vegetation.

1949. *Weatherby, C. A.* Rare Scott's spleenwort, one chance in a thousand. *Horticulture*, March: one page.

Popular treatment of selected plants.

SHREWSBURY (Worcester County)

1900. *Stone, Geo. Edward.* Flora of Lake Quinsigamond. *Worcester Nat. Hist. Soc. Ann. Repts.*, Oct. 1900: 3-8. Republ.: by author, signed 1899, 12 p.

Unannotated list of 450 plants, including cryptogams.

SOUTHBRIDGE (Worcester County)

- 1882-1883. *Amidown, Lucius Edwin.* The flora of Southbridge. *Southbridge Journal (newspaper)* 1882 (July 28, August 4); 1883 (November 9).

Unannotated list of vascular plants, with months of flowering.

1945. *Bromley, Stanley W.* An Indian relict area. *Sci. Mo.* 60:153-154.

Interpretation of vegetation from Indian times, through several changes, to present conditions.

SPRINGFIELD (Hampden County)

1901. *Barney, Everett H.* Flora of Forest Park. *Park Commissioners' Rept. Springfield, Massachusetts 1900*: 45-67.

Unannotated lists of native and introduced vascular plants.

1916. *Barney, Everett H.* Flora of Forest Park. *Rept. Board Park Commissioners City of Springfield, Mass. for the year ending November 30, 1916*: 23-36.

Unannotated lists of native and introduced vascular plants. Repeated in report for 1917:21-34.

1924. *Andrews, Luman, et al.* Catalogue of the flowering plants and ferns of Springfield, Massachusetts, growing without cultivation, *Springfield Mus. Nat. Hist. Bull.* 3: 221 p., 10 pl., map.

Annotated list of over 1200 vascular plants.

1927. *Seymour, F. C.* Additions to the flora of Springfield, Massachusetts. *Rhodora* 29:241-246.

Annotations on additions, and other comments.

STOCKBRIDGE (Berkshire County)

1914. [*Hoffmann, Ralph, and G. Thompson.*] Notes on Stockbridge trees. *Stockbridge* 1:8-11.

Unannotated list of 85 trees; and local notes.

SUFFOLK COUNTY

1880. *Gray, Asa*. The flora of Boston and its vicinity, and the changes it has undergone. Justin Winsor's *Memorial history of Boston, including Suffolk County, Massachusetts* 1:17-22, 1 f.

Consideration of pre- and post-Pleistocene changes. Popular treatment of selected seedplants.

SUNDERLAND (Franklin County)

1896. *Beals, A. T.* The ferns of Mount Toby, Mass. (*Linn.*) *Fern Bull.* 4: 1-2.

Popular treatment of selected plants.

1901. *Owen, Maria L.* Ferns of Mt. Toby, Massachusetts. *Rhodora* 3:41-43.

Popular treatment of selected plants.

TEMPLETON (Worcester County)

1905. *Blodgett, P.* List of plants, 10 p. *Templeton: author.*

Unannotated list of vascular plants.

WALTHAM (Middlesex County)

1883. *Baker, Edward D.* A partial list of the native flora of Waltham, Massachusetts, xii, 36 p. *Waltham: author.* Another printing: by *Waltham Botany Club*, without mention of author's name.

Unannotated list of plants, including cryptogams.

WAREHAM (Plymouth County)

1935. *Stevens, N. E.* Notes on *Zostera marina* in Upper Buzzards Bay, Mass. *U. S. Dept. Agric. Plant Disease Reporter* 19:232-233, F. 52.

Comments on exact locations of several small colonies in Buttermilk Bay. (Possibly also in Bourne town, Barnstable County.)

1936. *Stevens, N. E.* Notes on the condition of *Zostera marina* in Buttermilk Bay, Massachusetts. *U.S. Dept. Agric. Plant Disease Reporter* 20: 279-281, F. 48.

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WILLIAMSTOWN (Berkshire County)

1858. *Chadbourne, P. A.* Natural history catalogue for Williamstown, Massachusetts. *Williams Quarterly* 5: 342-359.

With unannotated list of vascular plants.

WORCESTER (Worcester County)

1894. *Tucker, Arabella Hannah*. Trees of Worcester, 98 p., illustr.
Worcester: Putnam Davis.
 Popular treatment of local species and of individual specimens.
1910. *Greenwood, Helen E.* Preliminary list of hepatics collected in Worcester, Massachusetts. *Bryol.* 13:7-9.
 Annotated list of 36 plants.
1915. *Greenwood, Helen E.* Revised list of hepatics collected in and near Worcester, Massachusetts. *Bryol.* 18:6-9, 28-29.
 Annotated list of 62 plants from Worcester and nearby towns.

WORCESTER COUNTY

- 1882-84. *Jackson, Joseph*. [Plants of Worcester County.] *Worcester Daily Spy (newspaper)*, 1882 (May); 1884 (March).
 List with notes of vascular plants, arranged according to season.
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1883. *Jackson, Joseph*. Flora of Worcester County, Massachusetts, 48 p.
Worcester: Nat. Hist. Soc.
 Briefly annotated list of 812 vascular plants, with "A list of the trees, shrubs and evergreen flowering plants growing naturally in Worcester County, Massachusetts."
 1889. *Jackson, Joseph*. Additions to the flora of Worcester County.
Camp and Lake No. 1.
 Annotated list of additions. Not seen.
1890. *Stone, Geo. Edward*. Additions to the flora of Worcester County.
Camp and Lake 2(4):10; (8):10-11.
 Unannotated lists of additions, including mosses.
- 1899-1901. *Harper, Roland W.* Additions to the flora of Worcester County, Massachusetts. *Rhodora* 1 (1899): 42-43, 201-205; 3(1901):185-189.
 Annotated lists of additions, additional annotations to old species.
1900. *Knowlton, Clarence Hinckley*. Further notes on the flora of Worcester County, Massachusetts. *Rhodora* 2:201-202.
 Annotated list of species, mainly additions.
1894. *Jackson, Joseph*. Flora of Worcester County, a catalogue of the phaenogamous and vascular cryptogamous plants of Worcester County, Massachusetts, 2 ed., rev., and enl. His *Through glade and mead...*, publ. at Worcester by Putnam Davis: 253-320. Publ. separately under this title, but including also pages 321-328, "The trees, shrubs and evergreen flowering plants growing without cultivation in Worcester County," publ. at Worcester by the author, 76 p., 5 pl.
 First part, an annotated list of 1098 plants. Second part, an unannotated list.

1909. *Jackson, Joseph*. A catalogue of the flowering plants and ferns of Worcester County, Massachusetts, 3rd ed., 102 p., 9 pl. *Worcester: Nat. Hist. Soc.*
Annotated list of 1240 vascular plants.
1927. *Jackson, Joseph, preface by N. P. Woodward*. Additions to the flora of Worcester, Massachusetts, a list of plants found growing out of cultivation, 49 p. *Worcester: Nat. Hist. Soc.*
Annotated list, increasing total to 1661 vascular plants.
1935. *Potter, David, and Norman P. Woodward*. Notes on the flora of Worcester County, Massachusetts. *Rhodora* 37:80-88.
Annotated list of additions.
1940. *Potter, David, Norman P. Woodward, et al.* Notes on the flora of Worcester County, Massachusetts - II. *Rhodora* 42:40-47.
Annotated list of additions.
1917. *Cook, H. O.* The forests of Worcester County, the results of a forest survey of the fifty-nine towns in the County and a study of their lumber industry, 88 p. *Boston: State Forester*.
A town by town survey, recognizing seven forest cover types.
1920. *Fischer, Richard T., and E. I. Terry*. The management of second growth white pine in central New England. *Journ. For.* 18: 358-366.
General conclusions, based on practice at Petersham and on observations of 54 areas in Cheshire (New Hampshire), Hampshire and northern Worcester Counties.
1920. *Spaeth, J. N.* Growth study and normal yield tables for second growth hardwood stands in central New England. *Harvard Forest Bull.* 2: 21 p., 4 t.
Composition and yield tables for three forest types in northern Worcester County.
1923. *Averill, R. C., W. B. Averill, and W. I. Stevens*. A statistical forest survey of seven towns in central Massachusetts. *Harvard Forest Bull.* 6: 1 f., 18 t.
Timber survey of eastern Franklin County and northwestern Worcester County, with vegetation data.
1924. *Tarbox, E. E., and P. M. Reed*. Quality and growth of white pine, as influenced by density, site and associated species. *Harvard Forest Bull.* 7: 30 p, 8 f., 10 t.
Correlation of growth characteristics with site and density, in three forest types of northern Worcester County.
1927. *Marshall, R.* The growth of hemlock before and after release from suppression. *Harvard Forest Bull.* 11: 43 p., 10 f., 8 t.
Reconstruction of post-logging history at Petersham. Hemlock studies in northern Worcester County.

1935. *McKinnon, F. S., G. R. Hyde, and A. C. Cline.* Cut-over old field pine lands in central New England. A regional study of the composition and stocking of the ensuing volunteer stands. *Harvard Forest Bull.* 18: 80 p., 12 f., 9 t.
Composition and density in relation to site and age. Northern Worcester, eastern Franklin, and Cheshire (New Hampshire) Counties.
1938. *Brierly, Wm. B.* The relation of *Pinus rigida* to physiographic features and soil types in central Mass. *Rhodora* 40:72-73.
Correlation with sterile sandy soil of Merrimac and Hinckley series.
1944. *Malumphy, T. L'H.* A study of pollution effect on the flora of a portion of the Blackstone Rivdr drainage area in Massachusetts. *Clark Univ. Abstracts of Diss. and Theses* 16:3-5.
Physical and chemical analyses in relation to aquatic spermatophytes.
1947. *Brues, Chas. T.* Changes in the insect fauna of a New England woodland following the application of DDT. *Harvard Forest Papers* 1:18 p., 18 t.
Concerns insect populations of typical upland forests. Royalston, Athol and Petersham towns.

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- Albertson, A. O.* 1921. See NANTUCKET CO.
- Alcott, Wm. Penn.* 1881. See CHELMSFORD.
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- Bigelow, Edwin Victor.* 1898. See COHASSET, 1898, Collier, P. L.
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- Clark, Hubert Lyman.* 1899. See GENERAL. 1887, Cobb, N. A.
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1915. See WORCESTER.
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1921. See BARNSTABLE CO.
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- Hitchcock, Edward.* 1829. See GENERAL.
- 1833, 1835. See STATE FLORAS.
- Hoffmann, Ralph, and G. Thompson.* 1914. See STOCKBRIDGE.
1922. See BERKSHIRE CO.
- Hollick, Arthur.* 1893. See MARTHA'S VINEYARD.
1901. See ELIZABETH IS.
1902. See BARNSTABLE AND MARTHA'S VINEYARD.
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1948. See PETERSHAM.
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1884. See GEORGETOWN.
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1899. See MIDDLESEX CO., 1888, *Dane, L. L.*
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- 1913-1915. See CONCORD.
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McKinnon, F. S.
- Illick, Jos. S.* 1927. See STATE FLORAS.
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1935. See BOSTON.
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1883. See WORCESTER CO.
1889. See WORCESTER CO., 1883, Jackson, J.
1894. See MILLBURY, and see WORCESTER CO.
1909. See WORCESTER CO.
1927. See WORCESTER CO., 1909, Jackson, J.
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1935. See NANTUCKET CO.
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- Judd, Sylvester.* 1905. See HADLEY.
- Kearney, T. H.* 1904. See FALMOUTH.
- Kenrick, E. B.* 1835-1836. See BOSTON.
- Kittredge, J., Jr.* 1913. See PETERSHAM.
- Knowlton, Clarence Hinckley.* 1900. See WORCESTER CO., 1883, Jackson, J.
1912. See DUXBURY.
1914. See PLYMOUTH CO. and BARNSTABLE CO.
1917. See CHELMSFORD.
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1924. See HINGHAM.
1945. See BOSTON DISTRICT.
1949. See BOSTON DISTRICT.
n. d. See MASHPEE.
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- Moore, A. H., and Arthur Stanley Pease.* n.d. See ANDOVER.
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- Moulton, Edw.* 1891. See NEWBURYPORT.
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1856. See ESSEX CO.
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1888. See NANTUCKET CO.
1901. See SUNDERLAND.
- Paine, Harriet Eliza.* 1883. See GROVELAND.
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- Parish, S. B.* 1901. See PLYMOUTH CO.
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- Pease, Cora E.* 1885. See BOSTON DISTRICT.
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1908. See BOSTON.

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1879. See ESSEX CO.
1880. See ESSEX CO. (two papers)
1881. See BOSTON DISTRICT.
1882. See BOSTON DISTRICT.
1883. See REVERE, 1883, Young, H. A.
1885. See ESSEX CO.
1891. See ESSEX CO.
1902. See SALEM.
1926. See SALEM.
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1841. See GENERAL.
1847. See BOSTON DISTRICT.
- Saunders, Mary T.* 1897. See GENERAL.
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1886. See SALEM.
- Seymour, F. C.* 1927. See SPRINGFIELD, 1924, Andrews, L.
- Shaler, N. S.* 1885. See GENERAL, and PLUM ISLAND, and MARSHFIELD.
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- Terry, E. I.* 1920. See WORCESTER CO. and HAMPSHIRE CO. 1920, Fisher, H. T.
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- Townsend, C. W.* 1913. See IPSWICH.
- Tracy, Cyrus Mason.* 1858, 1892. See ESSEX CO.
1862. See NAHANT.
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- Waugh, Frank A., and Chas. Thompson.* 1930. See AMHERST.
- Weatherby, C. A.* 1947. See SHEFFIELD.
1949. See SHEFFIELD.
- Westgate, J. W.* 1904. See PROVINCETOWN.
- Wherry, E. T.* 1920. See REVERE.
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- Woodward, Norman P.* 1927. See WORCESTER CO., 1909, Jackson J.
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THE GENUS *TIBOUCHINA* IN SOUTHERN VENEZUELA.

H. A. Gleason.

At the present time ten species of the large genus *Tibouchina* are known to occur in the mountains and savannas of southern Venezuela. Six of these are endemic to the region. Since considerable attention is now directed to the flora of this area, a brief conspectus of these species may be useful to students.

In every species of *Tibouchina* the upper surface of the leaf bears some kind of trichomes which are always adnate at base to the epidermis. The adnate portion may be very short in proportion to the free tip, or the tip itself may be very short, or scarcely developed, or occasionally lacking. The tip may vary from capillary to subulate, or it may be flattened and vary from lanceolate to ovate. When flattened, the hair-tips are naturally known as scales, and the indument is described as lepidote. Hairs of the same type occur also in a few other genera related to *Tibouchina*, and in one of them (*Chaetolepis*) several species show an analogous reduction to scales. In *Purpurella grossa*, often referred to *Tibouchina*, the hairs are not adnate at the base. This feature, together with the short blunt anthers, is evidence that the genus may well be segregated. In *Tibouchina mollis* also the hairs are barely adnate, and many may be observed which are completely free. Here the stamens are short and blunt and the connective not prolonged and very obscurely lobed, again suggesting a possible segregation of this species into another genus.

The hair-bases appear as fine striae on the surface. They are always more or less parallel, but are arranged in several series, in each of which they lie at a fairly constant angle from the nearest primary vein. They are often obscured or hidden if the free tips are slender and elongate.

In lepidote species the bases may be short or long. If they are much shorter than the distance between the primary veins, the surface will then be occupied at fairly regular intervals by the minute flattened tips, all pointing in the same direction; such a leaf may be retrorsely scabrous to the touch. If the hair-bases are elongate, those directed from the midvein toward the margin and those extending from the lateral veins toward the midvein meet in a longitudinal strip which always lies closer to the lateral vein than to the midvein. The projecting tips are now restricted to this zone and produce a distinctly visible scabrous strip on an otherwise glabrous surface, referred to by Pittier as a false vein. This strip may be several scales wide, as in *T. fraterna*, or very narrow, as in *T. Spruceana*. Hairs extend-

ing from the outer primary veins to the margins end in marginal scales which are usually directed toward the apex of the leaf and are more or less imbricate.

Scales also appear on the hypanthium of five of the ten species. In *T. aspera* and *T. Spruceana* they are lanceolate and elongate, often somewhat lacerate; they project much beyond the body of the hypanthium and nearly conceal the sepals. In the other three species the scales are much shorter, closely appressed, and symmetrically imbricate in intersecting oblique rows, simulating the spirals of the Fibonacci series as shown in the pine cone. These three species resemble each other in many floral features and form a distinct species-group, related to and possibly including the Andean *T. lepidota*.

The ten species of the region may be identified by the following key:

- Upper leaf-surface lepidote, the subulate or flattened free tips much shorter than the adnate, parallel, closely approximate bases.
- Hypanthium covered with flat scales; each flower subtended by a pair of bracts.
- Bracts connate by their margins into a 2-lobed cup partly enclosing the hypanthium; scales of the hypanthium lanceolate, elongate, projecting.
- Leaves 5-nerved; hairs of the upper surface ending irregularly, forming four rather indefinite strips of free subulate tips; younger stems covered with loosely appressed or strongly ascending, narrowly triangular scales. *T. aspera*.
- Leaves 3-nerved; hairs of the upper surface ending regularly, forming two very narrow strips or lines of free subulate tips; younger stems well covered with ovate, completely appressed scales. *T. Spruceana*.
- Bracts free; hypanthial scales short, appressed in regular series, not projecting.
- Leaves 3-nerved, the free, appressed, flattened hair-tips forming two broad strips. *T. fraterna*.
- Leaves 1-nerved, the hairs ending at the margin, or very short.
- Upper leaf-surface covered with completely adnate hairs, or with a few free tips at the margin. *T. sipapoana*.
- Upper leaf-surface covered with ovate appressed scales symmetrically disposed in rows. *T. duidae*.
- Hypanthium pilose, not lepidote; bracts present or lacking.

Bracts present and conspicuous; hypanthium beset, especially distally, with fleshy finger-like projections densely covered with long white hairs.

T. striphnocalyx.

Bracts none or early deciduous; hypanthium glandular-pubescent with ascending hairs 1--1.5 mm. long.

T. Kunhardtii.

Upper leaf-surface pilose with slender elongate hairs.

Leaves subsessile; stems simple, the upper leaves greatly reduced and bearing short-peduncled clusters of flowers, forming an elongate virgate inflorescence; petals 1.5--2 cm. long.

T. gracilis.

Leaves distinctly petioled; stems freely branched; petals 4--8 mm. long.

Leaves lanceolate, long-acuminate; stamens isomorphic but differing somewhat in size; connective not or scarcely prolonged below the filament.

T. longifolia.

Leaves ovate-lanceolate, about half as wide as long; stamens distinctly dimorphic; connective prolonged past the apex of the filament.

T. pseudomollis.

Tibouchina aspera Aubl. Common and widely distributed on savannas; variable in stature and especially variable in the length of the free hair-tips.

Tibouchina Spruceana Cogn. Restricted, as far as known, to sandstone savannas in British Guiana and southern Venezuela at moderate elevations.

Tibouchina fraterna N. E. Br. Abundant throughout the mountains from Roraima to Duida but not descending to the savannas at low altitude.

Tibouchina sipapoana Gl. sp. nov. Caules petioli folia subtus et hypanthia lepidoti; folia parva subsessilia coriacea elliptica uninervia, supra glabra, pilis toto adnatis, ad margines uniseriatim lepidota; flores sessiles terminales solitarii, bracteis 2 liberis sustenti; sepala erecta triangularia hypanthio longiora.

Stem 4-angled or 2-sulcate, the internodes up to 3 cm. but often only 2--3 mm. long. Petioles 2--3 mm. long. Leaf-blades coriaceous, somewhat conduplicate, elliptic or somewhat obovate, 8--15 mm. long, about half as wide, rounded or obtuse at both ends, 1-nerved, entire, but apparently minutely serrulate from a marginal row of scales; upper side glabrous, the totally adnate hairs extending from midvein to margin; lower surface lepidote. Flowers solitary, terminal, subsessile; bracts separate, opposite, coriaceous, oblong,

8.5 mm. long, 3 mm. wide, lepidote. Hypanthium 5.5 mm. long, cup-shaped or somewhat campanulate, closely lepidote with beautifully imbricate, broadly ovate, closely appressed scales about 1.5 mm. long, with a larger scale at each sinus. Sepals erect, triangular, 7 mm. long, 3.3 mm. wide at base, acute, but the sides involute above and therefore appearing acuminate, glabrous within, lepidote on the back like the hypanthium. Petals broadly triangular-obovate, 17 mm. long, 13 mm. wide, narrowed to the base, minutely crenate across the broadly rounded summit. Stamens isomorphic but somewhat different in size; filaments slender, glabrous, 8.3 or 7.7 mm. long; anthers erect, linear, 6.2 or 5.2 mm. long, opening by a ventro-terminal pore; connective terete, horizontal, 2 or 1.5 mm. long, minutely bilobed below the filament. Ovary setose at the summit; style about 13 mm. long, gradually tapering to a punctiform stigma.

Type, Maguire 27658, from the summit of Mount Sipapo. It closely resembles *T. duidae* in habit and floral characters, but differs completely in the indument of the upper leaf-surface.

Tibouchina duidae ined. First known from a collection by Steyermark on the summit of Duida, which will be the type when the species is formally published, and now known also from a collection by Mrs. Phelps on the summit of Parú. The present use of the name without a Latin diagnosis does not constitute publication. That will be effected in a forthcoming report on the collections of Steyermark from this region.

Tibouchina striphnocalyx (DC.) Gl. comb. nov. *Osbeckia striphnocalyx* DC., Prodr. 3: 140. 1828; *Chaetogastra striphnocalyx* Mart.; *Pleroma striphnocalyx* Tr.; *Pterolepis striphnocalyx* Cogn.; *Tibouchina yavitensis* Pitt. Hypanthium, sepals and bracts densely villous with copious white hairs up to 6 mm. long, but since some of these are inserted on processes up to 5 mm. long, their apparent length is as much as 11 mm.

This strange-looking plant was first collected by Martius somewhere along the upper Orinoco. A second collection by Spruce is said to come from San Carlos on the Río Negro; it became the type of var. *grandifolia* Cogn. As late as 1930 these two collections were the only ones available, but in the last few years ample material has come to hand.

Pittier is the first modern botanist who has considered the species, basing his study on Williams 13891, from Yavita on the upper Orinoco. He agreed with Triana, as I do also, that the plant belongs to the genus *Tibouchina* (or *Pleroma* of Triana). In fact, there is little reason except histori-

cal usage. Pittier compared his plant with the var. *grandiflora* and decided that it represented another species, which he named *T. yavitensis*. Williams' plant was collected at an altitude of only 128 meters and, so far as known, neither Spruce nor Martius climbed much above the lowland forests. It was not noted by Tate on Duida or Auyan-tepui; Steyermark did not find it on the various mountains which he visited. When Maguire reported it as a common shrub, repeatedly observed on the summit of Sipapo at altitudes above 1350 m., the question of a possible second species arose.

I have carefully compared Maguire's several collections with the Williams and Spruce plants. Aside from minor differences in dimensions they are alike in leaves, pubescence, and calyx; our specimens of Williams and Spruce do not show petals or stamens. All three agree also in a feature which has not been made clear in printed descriptions. The hypanthium is very densely villous and the surface is mostly concealed. After boiling and dissecting, it is seen that these hairs are grouped in fascicles, as is the case in the genus *Pterolepis*. The bases to which the hairs are attached vary in size. The lowest ones are mere raised swellings with an apical tuft of hairs only. The upper bases are progressively elongated, until those near the summit of the hypanthium are 5 mm. long and bear hairs along their sides as well as at the summit. These are the "appendages alternating with the calyx-lobes," as mentioned by Pittier and Martius and also crudely illustrated by the latter. His statement that they exist on the typical variety removes the last excuse for dividing the species.

Tibouchina Kunhardtii Gl. sp. nov. Sect. *Diotanthera*.
Caules parce ramosi, squamis adpressis non imbricatis tecti; folia subsessilia, oblanceolata, 5-nervia vel fere 5-plinervia, utrinque pilis fere toto adnatis dense tecta. Hypanthium et sepala triangularia breviter glanduloso-hirsuta. Stamina fere isomorpha; connectivum infra thecas breviter productum valde incurvum, infra apicem filamenti breviter bilobum.

Springly branched shrub 1--2 m. tall. Scales of the subterete stem 0.5--1.2 mm. long, those of the pedicels more spreading. Leaves firm, oblong or oftener oblanceolate, up to 10 cm. long and a third as wide, often smaller and only a fourth as wide, acute or subacuminate, entire, acute at base or somewhat cuneate, 5-nerved or barely 5-plinerved, the outer pair of nerves submarginal; hairs on both surfaces alike, the free tips narrowly subulate, 0.1--0.5 mm. long. Flowers 5-merous, in loose, open, trichotomous panicles, on pedicels up to 1 cm. long. Sepals triangular, 4 mm. long. Petals broadly ovate, 9 mm. long. Filaments 3.5--4 mm.

mm. long; anthers 3.5—4 mm. long; connective prolonged 0.6 or 0.8 mm. to the summit of the filament and below the filament into two slightly divergent, conic, obtuse lobes.

Collected seven times by Maguire on the summit of Cerro Sipapo, always in the wet soil of bogs and stream-banks; his number 27713 has been selected as the type. It is the only species of the section, so far as known to me, with hairs of the type described on the leaf.

Tibouchina gracilis (Bonpl.) Cogn. Widely distributed in tropical America, especially on savannas.

Tibouchina longifolia (Vahl) Baill. The most generally distributed species of the genus, extending from Mexico and Cuba to Paraguay and from sea-level to high altitudes.

Tibouchina pseudomollis Gl. Still known only from the type, collected by Tate just south of Roraima.

Tibouchina Catherinae Pitt., the type of which I have not yet seen, appears from the description to be a synonym of *T. fraterna*.

Acisanthera lasiophylla (Benth.) Gl. comb. nov. *Chaetogastra lasiophylla* Benth. Hook. Jour. Bot. 2: 291. 1840; *Tibouchina lasiophylla* Cogn.; *Pterolepis lasiophylla* Triana; *Acisanthera erecta* Gl. Careful comparison of the types of Bentham's *C. lasiophylla* and my *A. erecta* shows clearly that they are conspecific and leaves no room for doubt that the species belongs in *Acisanthera*, to which genus the valid specific name is hereby transferred. Sandstone savannas at moderate elevations; collected only a few times.

STUDIES IN FLORIDA BOTANY

9. The Cranichoid Orchids of Florida

- Alex D. Hawkes -

The relatively large and extensively distributed subtribe Cranichidinae of the Orchidaceae has three genera represented in the Flora of Florida. One of these, Ponthieva R.Br., may be classified as frequent to common and widely disseminated within our area, while the other two groups, Cranichis Sw. and Prescottia Idl., are excessively rare and highly restricted in their Floridian occurrence. These are all fairly small terrestrial orchids with comparatively insignificant flowers of great complexity and extreme interest to the student.

Key to the Florida Cranichoid Genera

- I. Flowers on widely-spreading pedicels.....Ponthieva R.Br.
II. Flowers not on widely-spreading pedicels.
A. Flowers hooded.....Prescottia Idl.
A. Flowers not hooded.....Cranichis Sw.

CRANICHIS Swartz Prodr. Veg. Ind. Occ. (1788) 8.

1. Cranichis muscosa Sw., l.c., 120.

Roots subterranean, clustered, thick, rough. Stem to 4 dm high, generally less. Leaves to 8 cm long, 4 cm wide, with a petiole up to 8 cm long, elliptic to ovate or oval, acute or obtuse, gradually extending up the stem and becoming bracteose. Bracts several, variable in size, enlarging toward base. Scape thin, erect, rather rigid. Raceme small, several- to many-flowered. Flowers snow-white, about 7 mm long, non-resupinate, with the lip uppermost. Dorsal sepal usually elliptic-lanceolate, cucullate, obtuse or acutish, to 3 mm long and 1.3 mm broad, uninnervose. Lateral sepals 2-nerved, about as long as dorsal, slightly broader, acutish or obtuse, oblique, more or less ovate-lanceolate. Petals about 3 mm long, 0.5 mm wide, linear to linear-lanceolate, obtuse. Lip simple, white marked with bright green on disc, cucullate, obtuse or acute, roundish, elliptical-oval or oblong-oval, 2.5-3 mm long and 2 mm broad. Column about 1.5 mm long, enlarged apically, 4-winged near concave anther area. Capsule ellipsoidal or oblong, to 8.5 mm long, 4 mm broad, with 6 small keels.

Rarely found in extreme southern peninsular Florida, mostly in potholes in the hammocks, or in decaying stumps and cypress knees in swamps. Also in the West Indies, Mexico, Central America, and northern South America. Flowers mostly in winter and early spring.

PONTHIEVA R. Brown in Ait., Hort. Kew., ed. 2, 5 (1813) 200.

2. Ponthieva racemosa (Walt.) Mohr in Contrib. U.S. Nat. Herb. 6 (1901) 460.

Arethusa racemosa Walt. Fl. Carol. (1788) 222.

Neottia glandulosa Sims in Bot. Mag. (1805) t. 842.

Ponthieva glandulosa R.Br. in Ait., Hort. Kew., ed.2, 5
(1813) 200.

Ponthieva Brittonae Ames in Torreyia 10 (1910) 90.

Leaves in a rosette, several, prostrate on ground or borne slightly above it, 5-8 cm long, rich lustrous green, covered with silvery pubescence, ovate, obtuse or acute, narrowing basally to a broad petiole. Spike 25-40 cm high, erect, bearing a rather lax raceme 10-20 cm long. Flowers 6-18, on ascending pedicellate ovaries 1 cm long, pure white or white striped and veined with bright emerald green and suffused with greenish and red, about 1 cm across, somewhat triangular in shape, non-resupinate, with the lip uppermost. Sepals prominently pubescent, white with three green stripes and tinged with greenish and reddish, 6-7 mm long, 2-2.5 mm broad, the laterals slightly wider than the dorsal, which is connate at the tip with the petals, ovate to oblong-lanceolate, obtuse, concave, the laterals somewhat falcate. Petals white, veined with green or yellowish-green, 4-6 mm long, 2-3.5 mm broad, dilated apically, semi-cordate or hastate, curved inward, with the adjacent edges contiguous, and the claw attached to the column about 1 mm above the base. Lip white, with palmate, raised, bright green veins, borne almost half-way up column on a clawed base, 4-6 mm long, 4-5 mm broad, the sides upcurved and wing-like, folded to sides of column. Column arcuate, about 4.5 mm long, slightly winged. Spur at base of lip, sharp, curved.

Very rare in southern peninsular Florida, frequent to common in central and northern areas, in moist hammocks and shady woods. Also from Virginia to the West Indies, Mexico, Central America, and in South America to Ecuador. Flowers in the fall and winter.

PRESCOTTIA Lindley in Hook., Exot. Fl. 2 (1825) 115.

3. Prescottia oligantha (Sw.) Ldl. Gen. & Sp. Orch. Pl. (1840)
454.

Cranichis oligantha Sw. Prodr. Veg. Ind. Occ. (1788) 120.

Prescottia myosurus Rchb.f. ex Griseb., Fl. Br. W. Indies
(1864) 640.

Roots thick, clustered, about 1 dm long. Leaves in a basal rosette, flaccid, several, oval to elliptic, acute or obtuse, gradually narrowing to sheathing petioles 3.5 cm long, lamina about 8 cm long, 3 cm wide. Spike erect, to 40 cm high, almost entirely clothed by sheathing tubular bracts about 3 cm long, which are oblong, and more or less acuminate, extending into the raceme. Raceme 5-7 cm long, dense, many-flowered. Flowers white, pink, or greenish, less than 4 mm in diameter, numerous, not opening fully. Sepals adnate basally to form a tiny cup, to which the other segments are joined, ovoid, obtuse, about 1.3 mm long, 1 mm wide, prominently uninervose. Petals attached to sepaline cup above the insertion of dorsal sepal, thin in texture, linear-spatulate to more or less obovate, obtuse, uninervose, 1 mm or less long, about 0.5 mm broad. Lip concave, trinervose, with the claw adnate to the sepaline cup, and with the

apical edges incurved rather sharply, 1.2 mm long, with a pair of basal auricles about 0.2 mm long which enclose the column partially. Column also attached to sepaline cup, very short, with wide wings apically. Capsule erect, ellipsoidal, about 4 mm long, 2.5 mm thick, with six more or less prominent keels.

Found in 1905 in a hammock formation in southern Florida; apparently not rediscovered here since that time. Also in the West Indies from the Bahamas south, and in Central America. Flowers in the winter.

STUDIES IN FLORIDA BOTANY

10. The Saprophytic Orchids of Florida

- Alex D. Hawkes -

The Orchidaceae of Florida are conveniently grouped in three sections as regards habit-- epiphytes, terrestrials, and saprophytes. Perhaps the least known of the trio are the last-named species, the saprophytes. They number two in the Florida flora, both members of the subtribe Corallorrhizinae. A third genus of this aggregation, Tipularia Nutt., also occurs within our area, but will not be treated further here.

The saprophytic genera growing in Florida, Corallorrhiza R. Br. and Hexalectris Raf., are both monotypic in this state, and rather infrequent in their occurrence. They are rather showy plants, aphyllous and fleshy, and customarily are found under shrubs or trees in shaded woodlands or hammock formations, often in somewhat extensive colonies.

Key to the Florida Saprophytic Genera

- I. Pollinia 4.....Corallorrhiza R.Br.
II. Pollinia 8.....Hexalectris Raf.

CORALLORRHIZA R. Brown in Ait., Hort. Kew., ed. 2, 5 (1813) 209.

1. Corallorrhiza wisteriana Conrad in Journ. Phil. Acad. Nat. Sci. 6 (1829) 145.

Corallorrhiza odontorrhiza Chapman Fl. South. U.S., ed. 2 (1884) 454, non Nutt.

Rhizome subterranean, branched, rough, creeping. Stem annual, thickened basally, covered by several rather loose, scarious sheaths about 5-9 cm long, dirty yellow or dull purple in color, to 40 cm high, generally somewhat less. Raceme terminal, 5-20, about 5 mm across, not opening fully, usually greenish spotted with red or maroon with a white lip that is typically blotched with purple. Sepals linear-lanceolate, fleshy, about 7 mm long, 1 mm wide. Petals slightly shorter, often wider, acutish, oblong, prominently trinervose. Lip 7 mm long, usually about 6.5 mm wide, suborbicular, undulate or crisped marginally, with a pair of slender calli near base. Column rather flattened, about 4 mm long, bearing four pollinia in an opercular, 4-celled anther. Capsule about 11 mm long.

Northern and central peninsular Florida, nowhere particularly common, usually in shady swamps and woods under trees or shrubs; gregarious. Also in the southern U.S. to Texas, north to Pennsylvania, Delaware, and Ohio.

HEXALECTRIS Rafinesque Neogen. (1825) 4.

2. Hexalectris spicata (Walt.) Barnh. in Torreya 4 (1904) 121.

Arethusa spicata Walt. Fl. Carol. (1788) 222.

Bletia aphylla Nutt. Gen. N. Am. Pl. 2 (1818) 194.

Hexalectris aphylla Raf. Neogen. (1825) 4, comb. not made;
ex S. Wats. & Coult. in A. Gray, Man. Bot. N. U.S.,
ed. 6 (1890) 501.

Hexalectris squamosa Raf. Fl. Tellur. 4 (1838) 48.

Coralorrhiza arizonica S. Wats. in Proc. Amer. Acad. 17
(1882) 379.

Roots thick, jointed, coralloid, in a compact cluster. Stem annual, robust, erect, to about 65 cm high, with several bracts. Bracts scarious, truncate, to 1 cm or more long. Raceme lax, apical, to 30 cm long, several-flowered. Flowers 2.5 cm across, varying in color from pale yellowish to buff or brownish, with prominent stripes of dark or light purple or purple-brown. Sepals with seven stripes of purple or purple-brown on inner surface, linear-oblong to somewhat elliptic, acute, to 2 cm long, slightly connate basally, somewhat curved. Petals not as long as sepals, somewhat curved, striate like the sepals, obovate to oblanceolate, usually slightly falcate. Lip yellowish or dirty-white, with four narrow purple lines on the lateral lobes and six or more irregular white crests on median disc, trilobate, more or less rotund-ovate when expanded, with a very crisped and undulate midlobe which is suborbicular in shape, and slightly crisped laterals which enclose the column. Column arcuate, short. Capsule, elliptic-oblong, 2.5 cm or more long.

Northern and central peninsular Florida, in woods; gregarious. Also north to Virginia and along the Gulf Coast to Arizona and northern Mexico. Flowers in the summer.

I. Nomenclatorial Transfers in Altensteinia and Campylocentrum

- Alex D. Hawkes -

During the course of taxonomic studies in the Orchidaceae of Cuba and Ecuador, it has become apparent that several nomenclatorial transfers are necessary in two genera, Altensteinia and Campylocentrum.

Reichenbach filius' genus Aa was established in 1854, in XEN. ORCH. 1:18. It is now considered referable to Humboldt, Bonpland, and Kunth's Altensteinia, erected in their NOV. GEN. ET SPEC. 1 (1815) 332. Because of this invalidity of Aa, the following transfers are required in the Ecuadorian species.

Altensteinia macra (Schltr.) A.D.Hawkes, comb. nov.

Aa macra Schltr. in Fedde Repert., Beih. 8 (1921) 37.

Ecuador: Riobamba, Chimborazo.

Altensteinia rhynchocarpa (Schltr.) A.D.Hawkes, comb. nov.

Aa rhynchocarpa Schltr. in l.c., 38.

Ecuador: Pichincha.

Altensteinia riobambae (Schltr.) A.D.Hawkes, comb. nov.

Aa riobambae Schltr. in l.c., 38, as Riobambae.

Ecuador: Chimborazo.

Altensteinia ustulata (Schltr.) A.D.Hawkes, comb. nov.

Aa ustulata Schltr. in l.c., 39.

Ecuador: Pichincha.

The sarcanthad genus Harrisella was established by Fawcett and Rendle in 1909, in JOURN. BOT. 47: 266, to accommodate a dwarf aphyllous epiphytic orchid which they considered distinct from the closely allied Campylocentrum Bentham (in JOURN. LINN. SOC. 18 (1881) 337). As the type of the new genus they designated Campylocentrum porrectum (Rchb.f.) Rolfe (in ORCH. REV. 11 (1903) 247), a concept based on Aeranthus porrectus Rchb.f. in FLORA 48 (1865) 279. Subsequently several additional species have been added to Harrisella, a genus which we do not now consider valid. The following Cuban species has not previously been transferred to Campylocentrum, and the new combination seems in order here.

Campylocentrum filiforme (Sw.) A.D.Hawkes, comb. nov.

Epidendrum filiforme Sw. Prodr. Veg. Ind. Occ. (1788) 126.

Harrisella filiformis Cgn. in Urb., Symb. Ant. 6 (1910) 687.

Cuba: Isla de Pinos. Also Jamaica, Hispaniola, P. Rico.

Fawcett and Rendle, in discussing Harrisella in their FLORA OF JAMAICA 1 (1910) 143, state: "The genus is very near to Campylocentrum, in which it has been included, but differs in the inflorescence, the lip, the form of the anther, and the form and dehiscence of the capsule." Inasmuch as these characters appear to intergrade with the true Campylocentrums, it is believed advisable to reduce Harrisella to Campylocentrum. Under this treatment the Cuban species of the genus are as follows:

Campylocentrum filiforme (Sw.) A.D.Hawkes, supra,

Isla de Pinos. Also Jamaica, Hispaniola, Puerto Rico.

- Campylocentrum micranthum (Ldl.) Rolfe in Orch. Rev. 9(1901)
236.
Angraecum micranthum Ldl. Bot. Reg. 21 (1835) t.1772.
Aeranthus micranthus Rchb.f. in Walp. Ann. 6 (1862) 90.
Oriente. Also Hispaniola, Trinidad, and northern South
America.
- Campylocentrum monteaverdi (Rchb.f.) Rolfe in Orch. Rev. 11
(1903) 247.
Aeranthus monteaverdi Rchb.f. in Flora 48 (1865) 279.
Harrisella monteaverdi Cgn. in Urb., Symb. Ant. 10(1910)
687.
Oriente. Also Hispaniola.
- Campylocentrum pachyrrhizum (Rchb.f.) Rolfe in Orch. Rev.
11 (1903) 246.
Aeranthus pachyrrhizus Rchb.f. in Flora 48 (1865) 279.
Aeranthus spathaceus Griseb. Cat. Pl. Cub. (1866) 264.
Pinar del Rio, Las Villas. Also South Florida, Jamaica,
Puerto Rico, Tobago, Trinidad, and northern South Am-
erica to Brazil.
- Campylocentrum Poeppigii (Rchb.f.) Rolfe in Orch. Rev. 11
(1903) 246.
Angraecum Poeppigii Rchb.f. in Linnaea 22 (1849) 858.
Pinar del Rio, Las Villas, Camaguey, Oriente. Endemic.
- Campylocentrum porrectum (Rchb.f.) Rolfe in Orch. Rev. 11
(1903) 247.
Aeranthus porrectus Rchb.f. in Flora 48 (1865) 279.
Harrisella porrecta Fawc. & Rendle in Journ. Bot. 47
(1909) 266.
Harrisella Amesiana Cgn. in Urb., Symb. Ant. 6 (1910) 687.
Oriente. Also South Florida, Jamaica, Yucatan, and El
Salvador.

STUDIES IN FLORIDA BOTANY

11. The Genus Vanilla in Florida

- Alex D. Hawkes -

Among the most complex and least-known of all orchid genera is the group Vanilla Swartz, a rather large aggregation of species extensively distributed throughout the tropical and sub-tropical regions of the globe. They are highly variable viney plants, prominently leafy or virtually aphyllous, bearing generally large and showy blossoms which characteristically agglutinate upon drying.

Although the Florida species of Vanilla are still imperfectly understood, it is apparent that at least four species of the genus are (or have been, in the case of Vanilla planifolia Andr which is now perhaps extinct within the confines of the state) indigenous here, two of the leafy group, and two with abortive foliage. The non-leafy species have been carefully studied by Donovan S. Correll, and the paper dealing with his work, "The American Species of 'Leafless' Vanillas" (in AMER. ORCH. SOC.

BULL. 15 (1946) 328-333) has been constantly referred to during the preparation of the following paper concerning the genus in Florida. His excellent diagnoses of two species are given verbatim.

Key to the Florida Vanillas

I. Plants with large leaves.

A. Flowers 9 cm long, greenish with white lip...3.V.phaeantha

A. Flowers 6 cm long, greenish-yellow with dark green and white markings on lip.....4.V.planifolia

II. Plants with small leaves, or none at maturity.

A. Lip less than 4 cm long, deeply 3-lobed..1.V.barbellata

A. Lip more than 4 cm long, not deeply 3-lobed.....
.....2.V.Dilloniana

1. Vanilla barbellata Rehb.f. in Flora 48 (1865) 274.

V. articulata Northrop in Mem. Torr. Bot. Club 12 (1902) 31, t.3.

"Plant scandent. Stem jointed, succulent, producing at the nodes bracts or abortive leaves and aerial roots; internodes smooth and somewhat angular, up to 3 dm. long. Leaves abortive, linear-lanceolate, acute, conduplicate and recurved, about 4 cm. long and 8 mm. wide; bracts of stem ovate, acute, up to 1.5 cm. long. Flowers as many as twelve, produced in short axillary racemes, fleshy. Floral bracts broadly ovate to triangular, obtuse, about 5 mm. long. Sepals and petals green. Dorsal sepal oblong-elliptic, obtuse, longitudinally concave, 3-4 cm. long, 9-10 mm. wide. Lateral sepals slightly oblique, oblong-elliptic to elliptic-lanceolate, obtuse, 3-4 cm. long, 1.1-1.2 cm. wide. Petals elliptic-oblong, broadly obtuse, prominently dorsally keeled, 2.9-3.9 cm. long, 1.1-1.4 cm. wide above the middle. Lip greenish below, deep red above shading to white on the edge, attached to the lower two-thirds of the column, in natural position involute with the midlobe strongly reflexed, 3-3.8 cm. long, 3.2-3.5 cm. wide when spread out; lamina broadly cuneate-flabellate, pleated and distinctly 3-lobed at the broadly truncated apex; disc with a retrorse tuft of hairs midway of the center and one or more lines of minute excrescences from the tuft of hair to the thickened apex of the mid-lobe. Column arcuate, glabrous, 2.3-3.3 cm. long. Capsule elongated, somewhat compressed, about 8 cm. long." (D.S. Correll, in op.cit., 328.)

Dade and Monroe Counties, South Florida, in habitats varying from mangrove swamps to dense hammocks and cypress sloughs. Also in Cuba, Haiti, and Puerto Rico.

2. Vanilla Dilloniana Correll in Amer. Orch. Soc. Bull. 15 (1946) 331, t.

Plant scandent, very elongated, sometimes attaining a length of 5 meters, copiously branched, thicket-forming. Stems jointed, the joints distant, terete, about 1 cm in diameter, with a furrow on each side, dividing it approximately in halves. Roots few, appearing from joints, usually about 5 cm long. Leaves abortive, falling soon after maturity, about 1.5 cm long and 5 mm wide at broadest point, triangular-lanceolate, acute, conduplicate. Rachis of inflorescence fleshy, 1.5 cm or more in diamet-

er, arising from node, bearing ten to twelve flowers, with a few rather large, fleshy, brittle bracts scattered along its entire length, particularly on the flower-bearing portion. Flowers extremely fugacious (lasting about ten hours), about 5 cm across the lateral sepals, 3 cm across the petals, slightly over 5 cm long, not opening fully, slightly fragrant. Sepals about 4 cm long and 1 cm across, the laterals usually about 2 mm wider, oblong-lanceolate, obtuse, slightly dentate apically, slightly galeate, with the margins minutely introrse, faintly keeled, waxy, greenish-beige, slightly darker at apex. Petals not widely opening, more greenish in color than sepals, rather concave, 4 cm long and 13 mm wide at broadest point, with a raised keel on the outside that is about 1 mm high and wide and runs the entire length of the segment; this keel protrudes between the dorsal and lateral sepals in bud. Lip tubular, enclosing the column for one-third of its length, almost 4 cm long and 2 cm across the apex, not as fleshy as the rest of the flower; tube abruptly expanded about 1 cm from base, which is greenish and white, becoming yellowish-green within; main tube slightly deflected downward apically, the lateral lobes overlapping at top, outside mostly white, faintly flushed with rose on bottom, stained and streaked with very dark and lighter wine-purple toward apex; midlobe completely curled around itself at front of tube, dark wine-purple, undulate marginally, with a single or double row of bright yellow papillae down its entire length; lateral lobes very undulate, white marginally, with an irregular zone of pale and dark wine-purple adjacent, then numerous tiny maroon papillae on a white ground. Column arcuate, white streaked with lilac near the anther, bright yellow and greenish-yellow at base.

Dade and Monroe Counties, South Florida, in hammocks and mangrove swamps, often frequent to common, but localized in distribution. Also in Cuba and Hispaniola.

3. *Vanilla phaeantha* Rehb.f. in Flora 48 (1865) 274.

Long vine, eventually attaining a length of several meters, creeping or clambering on shrubs, often gregarious. Nodes often as much as 15 cm apart. Leaves alternate, fleshy, to 15 cm long, 3 cm wide, varying from linear-elliptic to oblong, acute or somewhat acuminate, becoming clasping at the short thick base. Racemes to 5 cm long, borne from leaf-axils, or at apex of short lateral shoots, few-flowered. Flowers opening in succession, about 9 cm long, not fully expanding, greenish with a snow-white lip, subtended by acute bracts up to 14 mm long, 8 mm broad and triangular to ovate in shape. Sepals elliptic-ovate or oblanceolate, the dorsal obtuse and slightly longer than falcate acute laterals. Petals slightly shorter than sepals, oblanceolate, with a definite broad keel on back surface. Lip large, trilobate, adnate to column almost to its apex, broadly ovate when expanded, keeled behind, with a small apicula at apex, retuse, disc-nerve prominent, crenulate and crisped marginally, with a group of compressed, transverse, dentate crests opposite column on terminal part. Column hirsute below stigma, about 11 cm long. Capsule fleshy, about 9 cm long and 12 mm in diameter.

Southwestern peninsular Florida, mostly Collier and Monroe Counties, in a few scattered hammocks and swamps, where it is rather rare, but often gregarious. Also from the Bahamas south through the West Indies to Trinidad.

4. Vanilla planifolia Andrews Bot. Repos. 8 (1808) t.538.
Myobroma fragrans Salisb. Parad. Londin. (1807) t.82, excl.
 syn.

Vanilla fragrans Ames Sched. Orch. 7 (1924) 36.

Clambering or climbing vine, attaining a length of several meters, slender to very robust. Stems terete, variable in thickness, usually less than 1 cm in diameter, nodes 10 cm or more apart. Leaves alternate, oblong to ovate-oblong, acute or somewhat acuminate, leathery, to 18 cm long and 6 cm broad, sessile or with a short thick base. Inflorescences borne from leaf-axils, to 8 cm long, bearing up to 30 blossoms, often very numerous, especially in upper portions of plant. Bracts about 10 mm long, oblong, obtuse. Flowers long-pedicelled, not opening fully, rather fugacious (about eight hours duration), waxy, sickly-sweet fragrant, greenish, with the lip marked with darker green and white, about 6 cm long. Sepals linear-spatulate to oblong, rather obtuse, curved outward at tip, about 5 cm long. Petals less waxy in texture, slightly smaller, similar otherwise. Lip tubular, shorter than sepals, adnate to column by its edges near apex of that organ, triangular when expanded, dentate, with several longitudinal keels and a cluster of hairs on disc, sharply revolute at apex, vaguely trilobate. Column slightly clavate, hairy on lower surface, about 3 cm long; anther at front apex. Capsule cylindrical, fleshy, to 25 cm long.

Found only once on Cape Sable, Monroe County, South Florida, probably extinct within our area at present. Also in tropical America from the West Indies and Mexico to Brazil. This species is the principal source of commercial vanilla.

STUDIES IN FLORIDA BOTANY .

12. The Genus Oncidium in Florida

- Alex D. Hawkes -

Genus Oncidium was originally established in 1800 by Olaf Swartz (in VET. ACAD. NYA HANDL. 21: 239), to include some American epiphytic orchids. Today this massive and difficult genus includes an estimated 750 valid species, distributed from southern peninsular Florida to Argentina. The center of dissemination appears to be in Brazil, where some 250 species are known to occur; a second aggregation of Oncidiums occurs in Andean South America, where the subgenus Cyrtochilum (sometimes raised to full generic rank) reaches its most extensive development.

Four species of Oncidium are now known from Florida, all scarce to excessively rare epiphytes growing in the extreme

southern tip of the peninsula. Until quite recently, one of these was considered endemic within the area; it, Oncidium floridanum Ames, is now known to inhabit an island off the north coast of the Cuban province of Camaguey, Cayo Coco (cf. this writer's "Studies in Antillean Botany: 2. Two Additions to the Cuban Orchid Flora," PHYTOLOGIA 3, iv (1949) 155).

Key to the Florida Oncidiums

- I. Plants with prominent pseudobulbs. Flowers yellow, marked with brown on sepals and petals.....2. O. floridanum
- II. Plants without prominent pseudobulbs.
- A. Leaves to about 10 cm long, serrate marginally. Flowers purple and white.....4. O. variegatum
- A. Leaves to 30 cm or more long, not serrate.
1. Flowers about 2 cm across, yellow marked with reddish-brown.....3. O. luridum
1. Flowers less than 2 cm across, whitish or pink with red or red-purple spots.....1. O. carthaginense

1. Oncidium carthaginense (Jacq.) Sw. in Kongl. Svensk. Vetén. Acad. Handl. 21 (1800) 240.

Epidendrum carthaginense Jacq. Enum. Pl. Carib. (1760) 30.

Oncidium undulatum Salisb. in Trans. Hort. Soc. 1, ed. 1 (1812) 295, excl. syn. Epidendrum undulatum Sw.

Pseudobulbs minute, usually reddish, borne more or less appressed to the large rhizome, monophyllous. Leaves very thick, rigid, to 6 dm long and 15 cm wide, usually yellowish-green, somewhat spotted with reddish-purple, elliptic-lanceolate, acute. Inflorescence very large (to 3.5 m high, erect or arching), basal, many-flowered, usually reddish-suffused, somewhat paniculate. Flowers less than 2 cm across, about 3 cm long, vaguely fragrant at times. Sepals widely spreading, white, irregularly spotted and dotted with light brown; dorsal about 12 mm long, clawed for 5 mm at base, suffused with pinkish-magenta and marked with magenta there, apical portion expanded, ovate-elliptic, acutish, undulate, 7 mm long, 6 mm broad; laterals about 14 mm long, 5 mm broad, narrowed basally into a pseudo-claw, expanded above into a somewhat falcate, ovate-elliptic, acutish area which is undulate, wavy, and sharply recurved at the tip. Petals more pink-suffused, similar to dorsal sepal in shape, somewhat dentate above, 13 mm long, 7 mm broad, with the apical rounded limb more rotund-ovate than sepals. Lip trilobate, 14 mm long, 8-9 mm broad basally, about 11 mm broad at apex; midlobe reniform, the apex sharply recurved, 11 mm broad, 5 mm long, rather undulate and crisped, truncate to acutish, white, spotted and blotched with reddish-brown, suffused basally with pink; lateral lobes small, slightly undulate, at base yellow, becoming pale brown, and finally pink-magenta near the 4 mm wide isthmus, rotund-reniform, separated by isthmus from terminal lobe; callus large, about two-thirds as long as lateral lobes, bright magenta-pink, suffused with yellow at base, composed of two blunt bilobed sections separated by a deep groove, and a separate blunt bilobed terminal excrescence. Column erect, 6 mm long, with a broad wing on each side.

Southern Florida, principally Cape Sable, where it is excessively rare. Also in Mexico, Central America, and northern South America.

2. Oncidium floridanum Ames Sched. Orch. 7 (1924) 13, fig.2.

Oncidium sphacelatum Ames Contrib. Knowl. Orch. Fl. S.Fla. (1904) 22 (excl. t.), non Ldl.

Pseudobulbs large and prominent, clustered, ovoid, becoming slightly furrowed with age, thick, 4-10 cm long and 3-4 cm wide, about 4 cm through near base, sometimes slightly ancapitous, bearing 2-3 apical leaves and 3-5 basal ones. Leaves articulate, more or less conduplicate, linear-lanceolate, acute, the lower ones to 28 cm long, the upper as long or longer than the apical foliage, which is similar in shape, but attains a length of 75 cm and a width of 3 cm when expanded. Inflorescence basal, erect, paniculate, to 3.5 m high, bearing 30-80 flowers near apex. Bracts several, ovate, scarious, sheathing, obtuse, to 15 mm long and 10 mm broad when expanded; panicle-branches 3-12, usually about 1 dm long, bearing 2-12 flowers each. Flowers about 2 cm across, borne on arcuate green pedicels some 3 cm long, variable, generally with greenish-ochre sepals and petals, irregularly barred with dark brown, and a bright yellow lip which is marked with reddish-brown around basal callus. Sepals somewhat recurved, elliptic-lanceolate, acute, undulate, 13 mm long, 4.5-5 mm wide, the laterals usually obtuse and a little longer than dorsal. Petals recurved, elliptic-lanceolate, very undulate at base, less so above, with part of lower margins retrorse, 12.5-13 mm long, 5-6 mm broad at middle, with more dark brown markings than sepals. Lip large, 12 mm long, 10 mm across the lateral lobes, 9.5-10 mm across terminal lobe, rather pandurate, conduplicate toward apex of midlobe; lateral lobes rounded, obscurely dentate; middle lobe transversely oblong, minutely dentate, with an apicule about 1.5 mm long at tip; callus basal, 4 mm long, 3 mm high, with seven more or less distinct lobes, the bottom pair in turn lobulate, yellow, spotted with red-brown. Column about 7 mm long, with a wing 2 mm long on each side of apex, yellow, with a few scattered brown spots on posterior surface.

Previously considered to be endemic to a few scattered localities in extreme southern peninsular Florida (Dade, Collier, and Monroe Counties), but now known also from Cayo Coco, Prov. Camaguey, Cuba.

3. Oncidium luridum Ldl. in Bot. Reg. 9 (1823) 727.

Epidendrum undulatum Sw. Prodr. Veg. Ind. Occ. (1788) 122, non Oncidium undulatum Ldl.

Oncidium luridum var. guttatum Ldl. in Bot. Reg. 25 (1839) t. 16.

Oncidium guttatum Rehb.f. in Walp. Ann. 6 (1863) 782.

Oncidium maculatum Urb. in Fedde Repert. 15 (1918) 306, non Ldl.

Pseudobulbs very small, inconspicuous, frequently obscured by masses of fibrous roots at base of plant, monophyllous. Leaves erect or slightly arching, thick, rigid, oblong-lanceolate, leathery, to more than 5 dm long, somewhat conduplicate. Inflores-

cences basal, erect, but bending under weight of flowers, to 2 m high, bearing several hundred flowers, woody and persistent, somewhat paniculate. Flowers 4 cm wide (generally somewhat less), highly variable in color, typically yellow spotted and blotched with red-brown of varying hues, though occasionally clear lemon-yellow, without visible maculation, long-pedicelled, with widely spreading crisped segments. Dorsal sepal with several ramose nerves, obovate-oblong, rounded apically, with an abrupt, narrow elongate claw at base, about 17 mm long (5 mm of which is the slender claw), about 10 mm broad. Lateral sepals slightly narrower than dorsal, elliptical, and narrowing basally to form a long claw. Petals about as large as sepals, clawed basally, rounded-obovate, more or less rounded apically. Lip about 2 cm long and 2.5 cm broad, narrowing to 8 mm at base, trilobate; midlobe large, more or less reniform, cordate and slightly clawed basally, emarginate; lateral lobes small, elliptical, obtuse, marginally revolute; sinus rather broad, round, between the lateral lobes; crest on lower portion of disc, formed by basal part of calli on sides, usually with a third slender callus between lateral pair, bearing a bilobate tubercle on both sides. Column about 5 mm long, with a bilobate wing on each side. Capsule obovoid-oblong or obovoid-ellipsoidal, 6 cm long, about 2 cm in diameter, slightly narrowed basally.

Southern peninsular Florida, now very rare, Dade, Collier, Monroe Counties; also on Key Largo; in hammocks or cypress sloughs. Also in the West Indies, Mexico, Central America, and South America, to Peru.

4. Oncidium variegatum Sw. in Kongl. Svensk. Vetén. Acad. Nya

Handl. 21 (1800) 240.

Epidendrum variegatum Sw. Prodr. Veg. Ind. Occ. (1788) 122.

Oncidium velutinum Ldl. in Part. Fl. Gard. 1 (1851) 166.

Oncidium sylvestre Ldl. in Ann. & Mag. Nat. Hist., s.3, 1 (1858) 332.

Stoloniferous, bulbous epiphyte, highly variable in vegetative habit. Leaves distichous, ensiform, acute, marginally serrate, to 12 cm long and 8 mm broad, rigid. Inflorescence slender, erect, from base of leaves, usually exceeding them in length, simple or sparsely ramose, with a few large flowers. Flowers to 2.5 cm long, very showy. Bracts several, purplish, about 8 mm long. Flowers long-pedicelled (about 12 mm long), greenish and white, variously marked with brown-purple and magenta. Dorsal sepal free, spatulate or ligulate-spatulate, apiculate, to obtuse, 4-5 mm long, green and white with a few pale brownish-purple stripes. Lateral sepals connate except at extreme tips, forming a more or less spatulate segment about 6 mm long which extends behind the lip. Petals orbicular or pandurate-obovate, about 8 mm long and 5 mm wide, rather truncate, minutely apiculate, white suffused with pale magenta in upper half, green barred with brown below. Lip trilobate, sessile, about 11 mm long, 15 mm broad; lateral lobes small, white, obovate, somewhat recurved, joined to the midlobe by a slender yellow-dotted isthmus; midlobe reniform, emarginate, very cordate basally, white; crest large, yellow, at base of midlobe, with three round posterior

tubercles which are typically larger than the anterior ones. Column prominently winged, about 3 mm long, the wings vaguely lobate, tinged with purplish or pinkish, truncate above, rounded below.

Found only once within our area, in scrub thickets near West Palm Beach; it is apparently extinct here, and probably may be considered an escape plant. Also in the West Indies, principally Cuba and Jamaica.

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STUDIES IN ANTILLEAN BOTANY

6. An Oncidium New to the Bahama Islands

- Alex D. Hawkes -

In a previous paper in this series, the writer discussed the occurrence of the orchid Oncidium floridanum Ames on the island of Cayo Coco, Province of Camaguey, Cuba (cf. "Studies in Antillean Botany: 2. Two Additions to the Cuban Orchid Flora," PHYTOLOGIA 3, iv (1949) 155). It is now apparent that this singularly attractive, characteristically terrestrial species also occurs in the Bahamas.

A collection of this species has been made on the island of New Providence, near the city of Nassau, by Mr. Floyd S. Shuttleworth, of the University of Miami, and herbarium material is deposited in the Buswell Herbarium of that institution, without serial number. Mr. Shuttleworth found Oncidium floridanum to be very common in a scrub thicket, on Soldier Road, New Providence, growing as a terrestrial species with Epidendrums of several types. The plants are, vegetatively, much less robust than Floridian material, and perhaps best approach those specimens gathered by this writer in the Cuban locality; the leaves are inordinately slender, somewhat flaccid, and appear almost etiolated. The erect inflorescence in the Bahaman type reaches a height of only a little more than 3.5 dm, whereas in Florida the species often produces spikes to 3.5 m high! The blossoms in the New Providence plants are more suffused with greenish than is typical, and the segment arrangement is slightly more spreading.

The discovery of this Oncidium in Cuba, and now its subsequent location in the Bahamas, makes us wonder if perhaps its range will not prove to be more extensive in the Antillean region. It is closely allied to Oncidium sphaelatum Ldl., and specimens collected as that species may, upon more critical study, prove to be O. floridanum.

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ORCHID STUDIES

II. Notes on Grammatophyllum Blume - 1

- Alex D. Hawkes -

The orchidaceous genus Grammatophyllum was erected by Blume in the year 1825 (BIJDRAGEN, 378, t.20), the type species, G. speciosum Bl., coming from the vicinity of Buitenzorg, in Java. Since that time a large number of specific epithets have been added to the aggregation, the true identity of many of which is vague. The purpose of these notes on the genus is to attempt to clarify this confusion, with an eventual monographic treatment of the group in view.

Two species of Grammatophyllum are now commonly cultivated in this country, particularly in Florida, where they form some of our most highly prized orchids, in both amateur and commercial collections. They are discussed herewith. Grammatophyllum speciosum Bl., rarely cultivated here, will be taken up in a subsequent paper in this series.

Grammatophyllum Measuresianum Weathers in GARD. & FOR. 2 (1889) 524.

G. "grandiflorum" Hort., ined. (cf., "The Identity of Grammatophyllum "grandiflorum"", AMER.ORCH.SOC.BULL. 18(1919) 608-10).

Pseudobulbs caespitose, very large, ellipsoidal to ovoid, slightly furrowed with age, somewhat compressed laterally, to 30 cm long, to 8 cm broad, about 6 cm thick, bearing usually 5 apical and basal leaves. Leaves very large, leathery, elliptic-oblongate, obtuse to acutish, narrowed below, to 60 cm long, to 12 cm broad, venose, with a prominent stiff midrib. Inflorescence basal, stiffly erect, to 3 m high, bearing up to 50 flowers. Floral bracts brown, scarious, 12 X 4.5 mm when expanded, ovate, acutish. Pedicellate ovary almost straight, ivory-white, shaded with green toward flower, 6.5 cm long, 2.5 mm thick. Flowers dimorphic, rather waxy in texture, opening fully, faintly fragrant at times, very showy, 5 cm across in nature, 7.5 cm with petals expanded, cream-yellow with irregular spots and blotches of dark blackish-brown, with big single blotches at apex of sepals. Dorsal sepal thrust forward over column and lip, almost touching the erect lateral lobes of the labellum, apex and upper edges retrorse, undulate, concave below, 44 mm long, 16 mm broad, elliptic, acute-acuminate, with several darker veins. Lateral sepals very undulate, apex retrorse, 40 mm long, 13 mm broad, elliptic, acute, with a single prominent vein. Petals with outer third reflexed, 41 mm long, 11 mm broad, oblong-lanceolate, acutish, somewhat undulate, slightly falcate, with one prominent vein, narrowed to 2.5 mm broad at base. Lip trilobate, joined to column-foot, lateral lobes erect and enclosing the column, mid-lobe pendent and thrust forward slightly, 22 mm long, 21 mm broad, both when expanded; lateral lobes

erect, elliptic, truncate, minutely denticulate, pubescent below, yellowish, with six light brown veins which are branched at the ends, edged with light brown, with a narrow ovate whitish callus in the middle, pubescent, spotted inside with dark brown, 1 cm long, 2 mm wide below the middle, deeply grooved down center; mid-lobe 11 mm long from apex of callus, with a raised area at edge of lateral lobes about 2 mm high, pubescent basally, ovate, acutish, white with three dark brown curved lines, the middle one of which branches towards apex, raised area with slender groove in center. Column erect, arcuate, 16 mm long, about 3.5 mm broad below anther, white, marked and spotted with red-purple, especially around anther; pollinia 2. Capsule pendent, somewhat trigonate, oblong.

Philippine Islands: Mindoro, Lumbucan, Palawan.

This spectacular large-flowered species, now common in cultivation, particularly in Florida, will perhaps prove to be conspecific with Grammatophyllum Fenzlianum Rehb.f. It is a member of the section Gabertia, which also includes the following species.

Grammatophyllum scriptum (L.) Blume Rumphia 4 (1848) 48.

Epidendrum scriptum L. Sp. Pl. ed.2 (1763) 1351.

Cymbidium scriptum Sw. in Schrad. Journ. Bot. 2(1799) 218.

Vanda scripta Spreng. Syst. Veg. 3 (1826) 719.

Gabertia scripta Gaud. in Freyc. Voy. Uranie et Phys. (1829)

Grammatophyllum speciosum Idl. Gen. & Sp. Orch. Pl. (1833)

173, p.p. et quoad syn., non Bl.

Ophrys cernua Blanco Fl. Filip. (1837) 639, as Ophiris, non L.

Grammatophyllum multiflorum Idl. in Bot. Reg. 24 (1838) Misc. 46.

Grammatophyllum multiflorum Idl. var. tigrinum Idl. in Bot. Reg. 28 (1842) t.69.

Grammatophyllum Boweri F.v.Muell. in Wing South. Sci. Rec. (1883).

Grammatophyllum leopardinum Rehb.f. in Flora 71 (1888) 151.

Grammatophyllum Seegerianum Hort. ex Gard. Chron., s.3, 10 (1891) 49, nomen.

Grammatophyllum Guilielmi-Secundi Krsl. in Gartenfl. 43 (1894) 114.

Grammatophyllum scriptum (L.) Bl. var. Boweri Schltr. in Fedde Rept. Beih. I (1913) 951.

Pseudobulbs yellow-green, caespitose, large, to 20 cm high, 6 cm broad, 4 cm thick, ovoid, with 2-5 large leaves at apex and a few scarious sheath-remnants above joints. Leaves articulated, leathery, elliptic-lanceolate, venose, wavy, acutish, to 50 cm long, 5-8 cm broad at middle, narrowed somewhat toward base. Inflorescence basal, erect to strongly arcuate or pendent with weight of numerous blossoms, to 1.5 m long, bearing up to 100 flowers, often several produced by each bulb. Pedicellate ovary whitish-green, becoming green at base of flower, arcuate above, 4.5 cm long, 2.5-3 mm thick. NORMAL FLOWERS: Flowers rather thick and waxy, 4.5 cm across unexpanded petals, rather campanulate, only the petals somewhat spreading, greenish-yellow with irreg-

ular dark brown blotches on the inner surface, more greenish outside, and blotches only partially visible, rather fragrant en masse but odorless separately. Dorsal sepal somewhat curved over column and lip, concave, elliptic-lanceolate, acutish, apex slightly upturned, 31.5 mm long, 12 mm broad at the middle, obscurely undulate. Lateral sepals thrust forward, slightly falcate, elliptic-lanceolate, acutish, more greenish than the other segments 28 mm long, 11 mm broad at middle. Petals spreading, rather falcate, oblanceolate, almost obtuse, 29 mm long, 9.5 mm broad above the middle, narrowing basally, obscurely undulate, with the blotches more spot-like and regular than sepaline markings. Labellum jointed to column-foot, 11 mm long from joint to base of pendent mid-lobe, prominently trilobate, not as thick as other segments; lateral lobes partly enclosing column, erect, whitish-yellow, with several anastomosing brown veins, pubescent below, minutely dentate and undulate on forward edges, ovate-lanceolate, obtuse, 16 mm long, about 9 mm wide, with a grooved pubescent white and yellow callus between the two lobes with obscure brown dots and lines; middle lobe pendent or down-curved, pubescent above, 11 mm long from apex of callus, 5.5 mm broad, yellowish-white, with three dark brown median veins which become thickened apically, and a single similar line on each edge, apex yellow, rotund-ovate, acute; entire lip 13 mm long when expanded, 20 mm wide. Column arcuate, erect, white, marked with red-brown anteriorly and posteriorly, 14 mm long, the foot 1.5 mm long, with a minute yellow depression back of it. ABNORMAL (DIMORPHIC) FLOWERS: Flowers borne singly or in pairs at base of flower-bearing portion of inflorescence, 5 cm across, more rigid in texture than normal flowers, not opening fully, greenish-yellow, with irregular very dark brown splotches and spots. Differing principally from normal flowers in complete absence of labellum. Dorsal sepal 32 mm long, 11.5 mm broad, otherwise like normal form. Petals calyptrate at apex, not falcate, 31 mm long by 9 mm broad, not undulate, otherwise same as typical phase. Lip totally absent. Column very arcuate, about 11 mm long, the foot aborted into a bilobed slightly thickened area less than 1 mm long at column-base.

Philippines, where it is common, highly variable, and widely distributed from sea level to more than 500 m altitude. Also in Amboina, Ternate, Celebes, Borneo, and New Guinea, and the Solomon Islands.

This exceedingly attractive and spectacular species, now common in cultivation, particularly in Florida, often bears several thousand flowers on each specimen. It is a member of the section *Gabertia*, as is the initial species of this paper, and is as yet still incompletely understood. Its extremes of variance, coupled with distribution over a prodigious area in the Indonesian region, make for a highly polymorphic concept, which will only become understood and properly delimited upon the study of greatly increased wild collections, and further inspection of cultivated material.

ORCHID STUDIES

III. Two Miscellaneous Notes

- Alex D. Hawkes -

1. A Nomenclatorial Transfer in Cuban Malaxis

In the preparation of a check-list of the Orchidaceae of Cuba, in particular during the reviewing of the liparid genus Malaxis Solander ex Swartz (NOV. GEN. ET SP. PL. PRODR. (1788) 119), a new combination has been found necessary to account for the species Microstylis major Rchb.f.

Malaxis major (Rchb.f.) León ex A.D.Hawkes, comb.nov.

(Microstylis major Rchb.f. in Flora 71 (1888) 153.)

In Hermano León's treatment of the Orchidaceae in his FLORA DE CUBA 1 (1946), on page 372 the combination Malaxis major "Rchb.f." is given. Inasmuch as this transfer was not effected by the younger Reichenbach, we hereby validate it.

The occurrence of this terrestrial species in Cuba is noted by León (l.c.) as follows, "Alain 364 de hojas acovadas subiguales, racimo corimbiforme, se refiere con alguna duda á esta especie. Loma del Gato, Oriente."

2. An Orchid New to South Florida

Bletia patula Hook. var. alba A.D.Hawkes, var.nov.

Haec varietas a forma typica speciei differt flores omnino albis.

South Florida: Woodbury s.n., collected by Manley Boss in low scrubby pineland between Black Creek and Goulds, Dade Co., August 1947, TYPE! The type specimen is deposited in the Buswell Herbarium of the University of Miami, and the original living specimens are growing in the greenhouses at that institution.

Bletia patula Hook. (in BOT. MAG. 63 (1836) t.3518) is known from Cuba, Hispaniola, and Puerto Rico, and both the typical rose-flowered plant and the new albino variety are in cultivation in southern Florida. It is to be questioned whether or not the Goulds specimens may not be escapes. Two colonies of the plant in question were located during a field class in Local Flora of the University of Miami, under the supervision of Mr. Roy O. Woodbury, Assistant Professor of Botany. Initially the specimens were supposed to be robust plants of the common Bletia purpurea (Lam.) DC, but upon production of flowers proved referable to B. patula. The albino variety of this species has apparently not been validly published previously.

Harold N. Moldenke

AEGIPHILA MAGNIFICA var. **PUBESCENS** Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum subtus densissime breviterque pubescentibus supra dense puberulentis.

This variety differs from the typical form of the species in having the lower leaf-surfaces of even the most mature leaves very densely short-pubescent and the upper leaf-surfaces densely puberulent.

The type was collected by Alexander F. Skutch (no. 4139) in a clearing in the cloud forest, at an altitude of 1035 m., in the vicinity of El General, San José, Costa Rica, in 1939, and is no. 1644594 in the United States National Herbarium.

BOUCHEA CIPOËNSIS Moldenke, sp. nov.

Frutex; caulibus ramisque griseis plusminusve puberulis obtuse tetragonis, in statu senectute glabrescentibus; ramulis gracilibus acute vel obtuse tetragonis dense breviterque puberulis, pilis flavidulis; petiolis gracilibus abbreviatis dense breviterque pubescentibus, pilis cinereis divergentibus; laminis chartaceis ellipticis acutis serratis supra plusminusve adpresso-puberulis vel pilosulis, subtus densissime breviterque pubescentibus, pilis cinereis.

Shrub to about 1 m. tall; stems and branches medium-slender, gray, more or less puberulent, glabrescent in age, obtusely tetragonal; branchlets slender, grayish, acutely or obtusely tetragonal, densely short-puberulent with flavidulous hairs; nodes annulate; principal internodes 0.6--6 cm. long; leaves decussate-opposite; petioles slender, uniformly abbreviated, 3--5 mm. long, densely short-pubescent with spreading cinereous hairs; blades chartaceous, bright-green above, much lighter beneath, elliptic, 2.5--4 cm. long, 1.4--2.2 cm. wide, normally acute at the apex, rather coarsely serrate from below the middle to the apex with uniform apiculate-acute teeth, more or less appressed-puberulent or pilosulous above, very densely short-pubescent with cinereous hairs beneath; midrib slender, flat above, prominent beneath; secondaries very slender, 4 or 5 per side, flat or subprominulous above, often hidden by the dense pubescence beneath, arcuate-ascending; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, to about 20 cm. long, rather loosely many-flowered, subspicate-racemiform; peduncles 2--3 cm. long, they and the rachis slender, very densely puberulent; pedicels to 2 mm. long, more obscure before anthesis, puberulent; bractlets lanceolate, about 4 mm. long, attenuate at the apex, puberulent on the back; calyx tubular, 9--11 mm. long, 5-costate, puberulent, its rim shortly 5-apiculate; corolla lilac, hypocrateriform, zygomorphic, its tube about 1.5 cm. long, its limb to 1 cm. wide.

The type of this species was collected by Geraldo Mendes Magalhães (no. 4318) in the capoeira at Fazenda do Cipó, município Jaboticatubas, Minas Geraes, Brazil, on October 22, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is related to *B. boliviana* (Kuntze) Moldenke, but may be distinguished at once by its much smaller and shorter-petioled leaves.

CHASCANUM HUMBERTI Moldenke, sp. nov.

Suffrutex; ramis ramulisque gracillimis acute tetragonis griseis densissime cinereo- vel albedo-puberulis, pilis reflexis; foliis oppositis; petiolis gracillimis dense cinereo-puberulis; laminis chartaceis elongato-oblongis obtusis vel subacutis, ad basin longe attenuatis, utrinque sparsissime obscureque strigillosis glabrescentibus; inflorescentiis terminalibus spicatis laxe multifloris; corollis magnis pallide roseis.

Subshrub about 1 m. tall; branches and branchlets very slender, rather acutely tetragonal, light-gray, very densely cinereous- or albidous-puberulent with retrorse hairs, more or less striate-costate; nodes annulate; principal internodes 0.5--4.5 cm. long; leaves decussate-opposite, often with extremely abbreviated twigs in their axils; petioles very slender, 5--10 mm. long, canaliculate above, densely cinereous-puberulent; blades chartaceous in drying, probably more or less fleshy when fresh, elongate-oblong, 1--4 cm. long, 3--12 mm. wide, obtuse or subacute at the apex, long-attenuate at the base, very sparsely and obscurely strigillose, soon glabrescent on both surfaces; midrib slender, plane above, somewhat prominulous beneath and rather densely puberulent; secondaries and veinlet reticulation indiscernible on both surfaces; inflorescence terminal, spicate, 11--15 cm. long, rather loosely many-flowered; peduncles very slender, light-gray, 1.5--2.5 cm. long, very densely cinereous-puberulent; rachis similar to the peduncles in all respects but somewhat flexuous and less densely puberulent, not excavated; bractlets lanceolate, 4--5 mm. long, long-attenuate at the apex, lightly and minutely puberulent or glabrescent; calyx tubular, 11--12 mm. long, about 1 mm. wide, minutely puberulent or glabrescent, 5-ribbed, its rim very shortly 5-toothed, the teeth apiculate; corolla hypocrateriform, pale-rose, showy, long-exserted, its tube narrow-cylindric, about 3 cm. long, subglabrous on the outer surface or more or less scattered-pilose near the apex and short-pubescent at the mouth, its limb wide-spreading, deeply 5-parted, the lobes obovate, about 7 mm. long and 5--7 mm. wide, rounded or sinuate at the apex; stamens 4, didynamous, inserted near the apex of the corolla-tube, included; filaments extremely short; pistil included; fruit not seen.

The type of this handsome species was collected by my good friend and respected colleague, Dr. Henri Humbert (no. 11548) -- in whose honor it is named -- in forests and bush on limestone soil at an altitude of 50--200 m., Basse Vallée du Fiherenana, Madagascar, in November 1933 and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CHASCANUM INSULARE var. **CANESCENS** Moldenke, var. nov.

Hæc varietas a forma typica speciei ubique densissime canescentibus recedit.

This variety differs from the typical form of the species in being very densely canescent on the branches, stems, twigs, petioles, rachis, bractlets, calyxes, and leaves.

The type was collected by Henri Humbert (no. 19952) on calcareous rocky ground in xerophilous bush in the neighborhood of Tulear, near the hill of La Table, at an altitude of 150 m., Madagascar, on January 21, 1947, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CHASCANUM INSULARE var. **HUMBERTI** Moldenke, var. nov.

Hæc varietas a forma typica speciei foliis maturis sæpe plusminusve irregulariter dentatis recedit.

This variety differs from the typical form of the species in having many of its larger mature leaves more or less irregularly dentate toward the apex.

The type of the variety was collected by Henri Humbert (no. 13290) on gneiss rock at Mont Morahariva (Mahamena), in the valley of the Manambolo, on the right bank (basin of Mandrare) in the vicinity of Isomono, at an altitude of 1000--1400 m., in December 1933, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CHASCANUM INSULARE var. **TRIANGULARE** Moldenke, var. nov.

Hæc varietas a forma typica speciei recedit bracteolis triangularibus 1.5--2 mm. longis, ad apicem acutis vel obscure subacuminatis.

This variety differs from the typical form of the species in having the bractlets triangular in shape, 1.5--2 mm. long, acute or only very slightly subacuminate at the apex.

The type of this variety was collected by Henri Humbert and C. F. Swingle (no. 5493) on a calcareous plateau toward the east of the delta in the basin of Linta, at an altitude of 200--250 m., Madagascar, on August 29, 1928, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CIERODENDRUM CAPITATUM var. **RIODESIENSE** Moldenke, var. nov.

Hæc varietas a forma typica speciei recedit caulibus petiolisque densiuscule hirsutulo-pubescentibus (pilis late divergentibus brunneis), laminis foliorum supra regulariter pilosis (pilis translucensibus multicellularibus) subtus densissime breviterque pubescentibus.

This variety differs from the typical form of the species in having the stems and petioles rather densely hirsutulous-pubescent with wide-spreading brownish hairs, the upper leaf-surface regularly pilose with translucent multicellular hairs, and the lower leaf-surface very densely short-pubescent, especially on the venation. The leaf-blades are membranous, ovate, 14--22 cm. long and 7--14 cm. wide, abruptly short-acuminate at the apex, varying from sinuate-entire to coarsely and irregularly apiculate-dentate from the widest part to the apex with up to about

9 teeth per side. The petioles are 1.6--16 cm. long.

The type of this variety was collected by my good friend and colleague, E. Milne-Redhead (no. 4303), in the Mwinilunga district of Northern Rhodesia just south of Matonchi Farm in *Brachystegia* woodland on January 24, 1938, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

CLERODENDRUM MILNE-REDHEADI Moldenke, sp. nov.

Herba perennis erecta vel frutex; caulibus obtuse tetragonis saepe rubescentibus densiuscule puberulis vel breviter pubescentibus; foliis oppositis vel ternatis, vel approximatis; petiolis brevissimis vel obsoletis puberulis; laminis submembranaceis oblanceolatis acutis vel breviter acuminatis, ad basin cuneatis vel longe attenuatis, subintegris vel crasse 3--6-dentatis, supra minute irregulariterque strigillosis, subtus densiuscule punctatis puberulisque; inflorescentiis terminalibus paniculatis; cymis paucifloris; floribus magnis.

Erect perennial herb or much-branched shrub to 1 m. tall; stems pale-green or reddish-tinged, obtusely tetragonal, often slightly sulcate above, rather densely puberulent or short-pubescent throughout, less so in age; nodes not annulate; principal internodes 1.5--9 cm. long; leaves decussate-opposite or ternate, sometimes approximate, ascending; petioles very short, 1--2 mm. long, or obsolete, puberulent; blades submembranous, rather uniformly green on both surfaces or slightly lighter beneath, oblanceolate, 5.5--16 cm. long, 1.5--4.5 cm. wide, acute or short-acuminate at the apex, cuneate or long-attenuate to the base, subentire or coarsely dentate with 3--6 antrorse teeth above the widest part, minutely and irregularly strigillose above, rather densely punctate and puberulent beneath; midrib slender, plane above, prominent beneath; secondaries filiform, 3--6 per side, plane above, subprominulous beneath, ascending and slightly arcuate, not anastomosing at the margins and not entering the marginal teeth; veinlet reticulation sparse, obscure or indiscernible above, obscure beneath; inflorescence a terminal panicle 9--23 cm. long, to about 10 cm. wide, the lowermost pair of cymes usually in the axils of the uppermost leaves; cymes few-flowered, on slender puberulent stalks to about 4 cm. long, usually once or twice dichotomously branched with a central terminal flower in each dichotomy; bracts usually only one pair, subtending the second pair of cymes, foliaceous, sessile, to 3 cm. long and 8 mm. wide, puberulent on both surfaces; bractlets numerous, linear, 1--4 mm. long, puberulent, occasionally somewhat ampliate and purplish; flowers large, irregular; calyx pale-green, cupuliform, 4--7 mm. long, about 5 mm. wide, puberulent, the lobes red, often irregular, rounded; corolla irregular, green when young, the larger lip violet or purple, the other lobes mauve or greenish-mauve, 1.5--2 cm. long, subglabrate; stamens and style arching forward, entirely green when young, later whitish-mauve at base; anthers yellow, turning orange-brown; stigmas mauve or purple; fruiting-calyx incrassate, more or less patelliform, about 1 cm. wide, deeply 4-lobed with rounded lobes, puberulent on the out-

side; fruit deeply 4-lobed.

The type of this distinct species was collected by E. Milne-Redhead (no. 3526) -- in whose honor it is named -- in *Brachystegia* woodland just east of R. Matonchi in the Mwinilunga district, Northern Rhodesia, on December 6, 1937, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

COELOCARPUM GLANDULOSUM Moldenke, sp. nov.

Suffrutex; caulibus ramisque gracilibus griseis vel albidis obtuse tetragonis densiuscule albido-strigosis (pilis arcte adpressis antrorsis); ramulis immaturis brunnescentibus subsulcatis; foliis oppositis; petiolis gracilibus densiuscule albido-strigosis; laminis submembraneis vel tenuiter chartaceis saepe subfalcatis oblongis vel oblongo-ellipticis vel sublanceolatis vel suboblanceolatis saepe conduplicatis acutis vel obtusis, ad basin acutis vel cuneatis, regulariter dentatis, supra leviter strigillosis, subtus dense strigosis et resinoso-granulosis.

Subshrub 4--6 dm. tall; stems and branches slender, light-gray or whitish, obtusely tetragonal, all except the oldest ones rather densely white-strigose with short closely appressed antrorse hairs, the very youngest branchlets brunnescent and somewhat sulcate in drying; nodes very obscurely annulate; principal internodes 0.6--5 cm. long; leaves decussate-opposite, often with a cluster of very small ones on greatly abbreviated twigs in their axils; petioles slender, 3--10 mm. long, rather densely white-strigose like the branches; blades submembranous or thin-chartaceous, often slightly falcate, bright-green above, lighter beneath, varying from oblong or oblong-elliptic to obscurely sublanceolate or suboblanceolate, 1--3.5 cm. long, 4--1.4 cm. wide, often conduplicate, acute or obtuse at the apex, acute or cuneate at the base, regularly dentate along the margins except toward the base with acute or obtuse somewhat antrorse triangular teeth, lightly strigillose with whitish antrorse hairs on the upper surface, much more densely strigose and somewhat scattered resinous-granular beneath; midrib slender, flat or slightly impressed above, prominulous beneath; secondaries slender, about 5 per side, ascending, hardly arcuate, not entering the marginal teeth, mostly obscure above, prominulous beneath on larger leaves; veinlet reticulation obscure; inflorescence terminal, racemiform, 10--17 cm. long, subspicate, rather loosely many-flowered during and after anthesis, very dense before anthesis, densely spreading-pubescent and glandulose throughout; peduncles very slender, 1--2 cm. long, strigose-pubescent and glandulose; rachis with the hairs usually more spreading; pedicels filiform, 1--2 mm. long, spreading-pubescent and glandulose; bractlets narrow-elliptic, 1.5--2 mm. long, acute or subacuminate at both ends, spreading-pubescent and glandulose, rather divaricate, often falcate; calyx obovate, about 3.5 mm. long and 2.5 mm. wide, densely spreading-pubescent with gland-tipped hairs, 5-costate, its rim 5-toothed with very narrow and blunt callous-thickened apiculations about 0.5 mm. long and also glandular-pubescent; corolla white, usually tinged with rose or violet, infundibular, its

tube cylindric, about 4 mm. long, straight, its limb oblique, 2-lipped, the larger lip 3-lobed, the smaller 2-lobed, the largest lobe ovate, about 1.9 mm. long and 2 mm. wide, rounded and slightly erose on the margins, the remaining lobes similar but more rotund and only 1--1.3 mm. long and 0.8--1 mm. wide, glabrate or pulverulent; stamens 4, didynamous, inserted about 1.5 and 2 mm. above the base of the corolla-tube, included; filaments filiform, about 1 mm. long, glabrous, often genuiflexuous at the apex; anthers ovate-oblong, often held on a horizontal plane, about 0.8 mm. long and 0.3--0.5 mm. wide; pistil included; style capillary, 1--1.5 mm. long, glabrous; stigma peltate, about 0.5 mm. long, vertical; ovary subglobose, about 0.6 mm. long and wide, glabrous; fruiting-calyx hardly enlarged, somewhat urceolate, spreading-pubescent and glandulose; fruit splitting very readily into 2 similar hemispheric cocci, each about 2 mm. long and 1.3 mm. wide, shiny, brownish, smooth and almost flat on the commissural face, very convex and reticulate-ridged on the outer face.

The type of this distinct species was collected by Raymond Decary (no. 2733) on dunes at Ambovombe, Madagascar, on May 9, 1924, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

COELOCARPUM HUMBERTI Moldenke, sp. nov.

Suffrutex; ramis ramulisque gracilibus, in statu senectute albidis, in statu juventute brunnescentibus, argute tetragonis, saepe sulcatis densiuscule divaricato-pubescentibus, pilis brunneo-griseis; foliis oppositis; petiolis filiformibus dense pubescentibus, pilis brevibus saepe glanduliferis; laminis membranaceis brunnescentibus ovatis acutis vel obtusis, ad basin acutis vel acuminatis, irregulariter serratis utrinque densiuscule pubescentibus, subtus sparse resinoso-granulosis.

Subshrub 5--6 dm. tall; branches and branchlets slender, the oldest whitish or pale-gray, the younger ones brunnescent in drying, rather sharply tetragonal, the younger ones often sulcate in drying, rather densely spreading-pubescent with brownish-gray hairs of irregular length standing at right angles to the branch; nodes rather obscurely annulate; principal internodes 0.5--10.5 cm. long, usually rather abbreviated, rarely elongate; leaves decussate-opposite; petioles very slender or filiform, 0.4--3 cm. long, densely spreading-pubescent with short often gland-tipped hairs standing at right angles to the petiole; blades membranous or submembranous, rather dark-green and brunnescent on both surfaces in drying or somewhat lighter beneath, ovate, 1--6.5 cm. long, 0.5--3.2 cm. wide, acute or obtuse at the apex, acute or acuminate at the base, rather irregularly serrate along the margins except at the very base (the teeth acute or subacute on small leaves, often blunt and even biserrate on large leaves), rather densely pubescent on both surfaces with hairs that are irregular in length and are more or less antrorsely appressed above, more or less sparsely resinous-granular beneath; midrib very slender, flat above, subprominulous beneath; secondaries very slender, 4 or 5 per

side, mostly obscure or indiscernible above, subprominulous or obscure beneath, forking near the margins with a branch going to the apex of each marginal tooth; veinlet reticulation obscure or indiscernible; inflorescence terminal, subspicate-racemiform, 7--25 cm. long, rather loosely many-flowered when elongate, somewhat more dense when abbreviated, very dense before anthesis, rather densely spreading-pubescent throughout with mostly gland-tipped hairs and also resinous-granular; peduncles very slender, 1--2.5 cm. long, tetragonal; pedicels filiform, 1--3 mm. long; bractlets linear, about 3 mm. long; calyx tubular, somewhat gibbous toward the base, about 3 mm. long and 1.8 mm. wide, 5-costate, densely spreading-pubescent with gland-tipped hairs, slightly zygomorphic, its rim 5-toothed, the teeth narrow callous-thickened apiculations, 3 about 0.2 mm. long and the other 2 about 0.5 mm. long; corolla infundibular, white or pale-violet, tinged violet in the throat, glabrous, its tube infundibular, about 4 mm. long, ampliate at the apex, its limb 2-lipped, venose, the larger lip 3-lobed, the other 2-lobed, the largest lobes suborbicular, about 2 mm. long and wide, erose-rounded on the margins, the 2 adjacent lobes about 1.5 mm. long and wide and the remaining 2 about 1 mm. long and wide; stamens 4, didynamous, one pair inserted about 1 mm. and the other pair about 1.5 mm. above the base of the corolla-tube, included; filaments filiform, about 1 mm. long, glabrous, genuflexuous or sigmoid at the apex; anthers oblong, about 0.7 mm. long and 0.4 mm. wide; pistil included; style capillary, about 0.5 mm. long, glabrous; stigma peltate, vertical, about 0.5 mm. long; ovary subglobose, about 0.7 mm. long and wide, glabrous; fruit splitting very readily into 2 similar hemispheric cocci, each about 2 mm. long and 1 mm. wide, nitid, brownish, flat and smooth on the commissural surface, very convex and reticulate-ridged on the outer face.

The type of this distinct species was collected by Henri Humbert (no. 14292) -- in whose honor it is named -- on a limestone plateau in the forest of Analafanja, north of Fiherenana, at an altitude of 950--1000 m., Madagascar, in March 1934, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

COELOCARPUM SWINGLEI Moldenke, sp. nov.

Suffrutex; caulibus ramisque brevibus rigidis gracilibus pallide griseis vel albidis dense adpresso-strigosis; foliis oppositis numerosis uniformibus sessilibus vel subsessilibus; laminis firme chartaceis elliptico-oblongatis rotundis vel subacutis, ad basin attenuato-cuneatis, obscure cremulatis vel subintegris, supra minute adpresso-strigillosis, subtus densiuscule strigosis; inflorescentiis rigide rectis dense multifloris.

subshrub, apparently much branched; stems and branches short, stiff, slender, light-gray or whitish, densely strigose with closely appressed antrorse white hairs, rather obtusely tetragonal, often canaliculate-sulcate on the younger parts; nodes not plainly annulate; principal internodes 0.7--3.8 cm. long; leaves decussate-opposite, numerous, quite uniform in size and

shape, sessile or subsessile; petioles obsolete or to 1 mm. long and densely strigose, margined; blades rather firmly thick-chartaceous, uniformly bright-green on both surfaces or lighter beneath, elliptic-oblancoelate, 1--2 cm. long, 3--6.5 mm. wide, rounded or subacute at the apex, attenuate-cuneate at the base, very shallowly and obscurely crenulate toward the apex or subentire, minutely appressed-strigillose with very short antrorse hairs above, much more densely and conspicuously strigose beneath or sometimes densely whitish-strigose on both surfaces; midrib slender, impressed above, prominent beneath; secondaries very slender, 3--5 per side, close together, ascending, hardly arcuate, impressed above, prominulous beneath; veinlet reticulation obscure on both surfaces; inflorescence terminal, stiffly erect, spicate, very densely many-flowered before, during, and after anthesis, 3--11 cm. long, about 9 mm. wide during anthesis (including the corollas), densely white-strigose with appressed whitish hairs throughout; peduncles slender, 1--1.8 mm. long; pedicels absent; bractlets linear-lanceolate, 3--3.5 mm. long, attenuate-acuminate at the apex, densely strigose; calyx obconic, about 3.5 mm. long, slightly zygomorphic, about 2 mm. wide at the apex, 5-costate, very densely strigose with whitish antrorse hairs, its rim 5-toothed, the teeth narrowly callous-apiculate and about 0.5 mm. long; corolla infundibular, glabrous, its tube infundibular, about 4 mm. long, straight, amplicate above, its limb erect, 5-lobed, the lobes subequal, rotund-lingulate, about 1.5 mm. long, 1--1.5 mm. wide, erose-margined, venose; stamens 4, didynamous, included, inserted about 2 and 2.5 mm. above the base of the corolla-tube; filaments filiform, about 0.5 mm. long, glabrous; anthers oblong, about 0.9 mm. long and 0.6 mm. wide; pistil included; style capillary, about 1 mm. long, glabrous; stigma peltate, vertical, about 0.5 mm. long; ovary oblong-subglobose, about 0.7 mm. long, 0.6--0.7 mm. wide, glabrous; fruit apparently not separating into 2 distinct cocci, subglobose, hard and dry, about 2 mm. long and wide, brumescens or nigrescent, not nitid, glabrous, marked with very few obscure ridges.

The type of this very distinct species was collected by Henri Hubert and C. F. Swingle (no. 5413) on sand near Itampolo at Lake Manamoetsa on the delta of the Linta, southwest coast of Madagascar, at an altitude of 1--10 m., between August 17 and 24, 1928, and is deposited in the United States National Herbarium at Washington.

LANTANA MILNE-REDHEADI Moldenke, sp. nov.

Herba lignosa; ramis debilibus obtuse tetragonis densiuscule breviter pubescentibus vel adpresso-puberulis; foliis oppositis; petiolis brevibus vel subobsoletis adpresso-pubescentibus glanduloso-punctatis resinosis; laminis firme chartaceis ovatis acutis, ad basin attenuato-acuminatis, regulariter serratis, supra scabris, subtus puberulis et resinoso-granulosis; inflorescentiis axillaribus spicatis cylindricis dense multifloris; bracteolis late ovatis mucronatis vel breviter acuminatis.

Woody herb; branches sprawling, obtusely tetragonal, rather

densely short-pubescent or puberulent with arcuate-appressed antrorse fulvous hair; nodes indistinctly annulate; principal internodes 2.5--6.5 cm. long; leaves decussate-opposite; petioles to 5 mm. long or subobscure, appressed-pubescent with short fulvous hairs and glandular-punctate with resinous globules; blades rather firmly chartaceous, deep-green above, somewhat lighter beneath, ovate, 3--5.5 cm. long, 1.3--2.7 mm. wide, acute at the apex, attenuate-acuminate into the winged petiole at the base, regularly serrate with rounded teeth from the apex to near the base, scabrous above, rather abundantly puberulent and resinous-granular beneath; midrib slender, impressed above, prominent beneath; secondaries slender, about 6 per side, ascending, not much arcuate (if at all), impressed above, prominent beneath, ending in the sinuses between the teeth; veinlet reticulation abundant, impressed or subimpressed above, prominent beneath; inflorescence axillary, 2--4 per node, shorter than the subtending leaves, ascending; peduncles slender, firm, 0.5--4 cm. long, rather densely short-pubescent with antrorse appressed fulvous hairs and densely resinous-granular; spikes cylindrical, elongated to 3 cm. in fruit and to 1.4 mm. wide, densely many-flowered; bractlets closely imbricate, green but tinged dull-purple, broadly ovate, to 10 mm. long and 9 mm. wide, mucronate or short-acuminate, sparsely appressed-puberulent or strigillose and resinous-punctate on both surfaces, venose, foliaceous; corollas bright-mauve, 4--5 long, densely puberulent on the outer surface, its limb 2 mm. wide; fruit drupaceous, subglobose, about 3 mm. in diameter, sparsely puberulent-pilosulous, ridged and sulcate in drying.

The type of this species was collected by my good friend, E. Milne-Redhead (no. 3542) -- in whose honor it is named -- just west of Matonchi Farm, in *Brachystegia* woodland, Mwinilunga district, Northern Rhodesia, on December 7, 1938, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LANTANA PITTIERI Moldenke, nom. nov.

Cordia microcephala Willd. in Roem. & Schult., Syst. Veg. 4: 801. 1819 (not *Lantana microcephala* A. Rich., Fl. Cub. Phanerog. 2: 141. 1850).

LANTANA RHODESIENSIS Moldenke, sp. nov.

Herba crassa vel suffrutex; caulibus angulatis multisulcatis densiuscule pubescentibus, pilis antrorse-divergentibus sordidis; foliis verticillatis; petiolis crassiusculis dense pubescentibus saepe plusminusve resinoso-granulosis; laminis submembranaceis ovatis apicem versus gradatim attenuatis, ad basin abrupte acutis vel rotundatis, regulariter crasso-serratis, supra sparsiuscule scabrido-pilosis, subtus dense puberulis vel breviter pubescentibus; inflorescentiis axillaribus capitatis; pedunculis valde abbreviatis dense antrorso-pubescentibus.

Coarse herb or shrub; stems rather distinctly angled and many-sulcate, rather densely pubescent with antrorse-spreading sordid hairs; nodes not plainly annulate; principal internodes 4.5--7.5 cm. long; leaves whorled in 3's or 4's; petioles

stoutish, 3--7 mm. long, densely pubescent with straight antrorse white hairs like the stems and often more or less resinous-granular; blades submembranous, dark-green above, lighter beneath, ovate, 6--8 cm. long, 3--4 cm. wide, gradually attenuate to the acute apex, abruptly acute or rounded at base, regularly and coarsely serrate with rounded or abruptly acute teeth from the apex almost to the very base, rather sparsely scabridous-pilose above, densely puberulent or short-pubescent beneath; midrib slender, prominulous beneath; secondary veins slender, plane above, prominulous beneath, 5 or 6 per side, arcuate-ascending, not entering the teeth, their upper branches ending in the sinuses; veinlet reticulation rather abundant, rather indistinct above; inflorescence axillary, capitate, much shorter than the subtending leaves; peduncles much abbreviated, 5--12 mm. long (in fruit), densely pubescent like the stems with antrorse whitish hairs; heads subglobose, to 2 cm. long and wide (in fruit); bractlets foliaceous, broadly ovate, 1.4--2 cm. long, 5--7 mm. wide, long-attenuate or acuminate at the apex, truncate or rounded at base, venose, densely appressed-puberulent or strigillose; flowers not seen; fruit drupaceous, globose, about 2 mm. in diameter.

The type of this very distinct and unique species was collected by Mrs. Macaulay (no. 735) near Mumbwa, Northern Rhodesia, in 1911, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LANTANA SCABIOSAEFLORA f. **ALBIDA** Moldenke, f. nov.

Hæc forma a forma typica speciei corollis albidis recedit.

This form differs from the typical form of the species in having its corollas cream-colored to nearly white.

The type was collected by Ira L. Wiggins (no. 10899) near the junction of the Rio Luis and Rio Ambocas, 10 km. due south of Portovelo, at an altitude of 2200--2500 feet, El Oro, Ecuador, on October 6, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LANTANA SWYNNERTONII Moldenke, sp. nov.

Frutex; ramis gracilibus acute tetragonis plusminusve puberulis inermibus, pilis saepe antrorse uncinatis; foliis oppositis vel ternatis; petiolis obsoletis vel brevissimis puberulis et saepe longe pilosis; laminis chartaceis ellipticis acutis vel rotundatis, at basin acutis, regulariter serratis, supra minutissime puberulis, subtus dense puberulis.

A shrub; branches slender, acutely tetragonal, more or less puberulent, the hairs often antrorsely uncinately, unarmed; nodes rather indistinctly annulate; principal internodes abbreviated, 0.8--4.3 cm. long; leaves opposite or ternate; petioles obsolete or to 2 mm. long, puberulent and often also long-pilose with white antrorse hairs; blades chartaceous, elliptic, 2--4.5 cm. long, 1--2 cm. wide, acute or rounded at apex, acute at base, regularly serrate with rounded teeth from the apex almost to the base, microscopically puberulent above, densely puberulent beneath; midrib very slender, subimpressed above, prominu-

lous beneath; secondaries very slender, plane or very slightly subimpressed above, prominulous beneath, 5 per side, ascending, not entering the teeth; inflorescence axillary, 2 or 3 per node, surpassing the subtending leaves; peduncles slender, 3--4.5 cm. long, minutely puberulent; heads small, densely flowered, hemispheric, 1--1.3 cm. wide; bractlets broadly elliptic-ovate, about 3 mm. long and wide, abruptly acute, densely puberulent on the back; corollas about 6 mm. long, mauve, densely puberulent on the outside, the limb about 3 mm. wide; fruit purple.

The type of this curious species was collected by C. F. M. Symmerton (no. 259) near Chirinda, Gazaland, Southern Rhodesia, at an altitude of 3500 feet, in 1906, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The species obviously belongs in the *L. Camara* L. group, but differs conspicuously in its broad bractlets.

LIPPIA AFRICANA var. **SESSILIS** Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis firmis rigidis sessilibus verticillatis uniforme angusto-ellipticis supra perscabris bullatisque, inflorescentiis verticillatis foliam aequantibus.

This variety differs from the typical form of the species in having its leaves firm and rigid, sessile, whorled in 4's, and uniformly narrow-elliptic, 2.5--4.5 cm. long and 8--13 mm. wide, very scabrous and bullate above, and the inflorescences whorled in 4's, equaling or slightly exceeding the leaves.

The type was collected by H. V. Lely (no. 320) at Naraguta, Northern Nigeria, on June 23, 1921, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LIPPIA GRANDIFOLIA var. **LONGIPEDUNCULATA** Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis regulariter usque ad 4 cm. longis recedit.

This variety differs from the typical form of the species in having its peduncles regularly up to 4 cm. long.

The type was collected by R. Dummer (no. 54) in elephant grassland, at 4000 feet elevation, at Kepayo, Uganda, between July and September, 1914, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LIPPIA MULTIFLORA var. **PUBESCENS** Moldenke, var. nov.

Haec varietas a forma typica speciei recedit caulibus ramisque petiolisque pedunculisque dense strigoso-pubescentibus et laminis foliorum supra plusminusve scabro-pilosis, subtus dense breviterque pubescentibus.

This variety differs from the typical form of the species in having its stems and branches, as well as the petioles and peduncles, densely strigose-pubescent, and its leaf-blades more or less scabrous-pilose above and densely short-pubescent beneath.

The type was collected by H. V. Lely (no. 241) at Naraguta, altitude 4000 feet, Northern Nigeria, on May 30, 1921, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Its pubescence renders this variety very distinct.

LIPPIA NIGERIENSIS Moldenke, sp. nov.

Herba annua; caulibus ut videtur simplicibus obtuse tetragonis sulcatis dense breviterque pubescentibus, pilis irregulariter contortis divergentibus albidis; foliis ternatis adscendentibus; petiolis dense albido-pubescentibus; laminis fime chartaceis oblongo-ellipticis acutis vel subacutis regulariter serratis supra scabris et strigilloso-pilosis, subtus dense canescento-tomentellis; inflorescentiis terminalibus corymbiformibus dense canescento-pubescentibus, pilis antrorsis.

Annual herb; stems apparently simple, obtusely tetragonal, the sides sulcate, densely short-pubescent with irregularly twisted rather spreading whitish hairs; nodes rather indistinctly annulate; principal internodes 5--11 cm. long; leaves ternate, ascending; petioles 1 cm. long or less, densely white-pubescent with more or less antrorse hairs; blades firmly chartaceous, oblong-elliptic, 4.5--9.5 cm. long, 1--2 cm. wide, acute or subacute at apex, rather regularly serrate with bluntish teeth except at the base, scabrous and strigillose-pilose above, densely canescent-tomentellous beneath; midrib slender, impressed above, prominent beneath; secondaries very slender, short, 10--12 per side, arcuate-ascending, arcuately joined near the margin, not extending into the teeth, impressed above, prominulous beneath; veinlet reticulation abundant, subimpressed above, prominulous but usually hidden by the tomentum beneath; inflorescence axillary and terminal, the axillary ones usually limited to a pair in the upper 1 or 2 groups of leaf-axils, the terminal ones aggregated into a more or less flattened corymb of which most of the rays are compound (branched to form a small umbel of heads at the apex); primary and secondary peduncles densely canescent-pubescent with more or less antrorse hairs; bracts limited to 1 or 2 groups of 2 each beneath and in the terminal corymb; spikes capitate or to about 1 cm. long, densely many-flowered; bractlets ovate, about 4 mm. long and 2 mm. wide, acuminate or subacuminate, very densely villous with canescent or slightly yellowish hairs; corolla-tube about 3 mm. long, densely tomentellous on the outside except at the very base, the larger lip an additional 1 mm. long, tomentellous on the outer surface, glabrate within.

The type of this distinct species was collected by W. D. MacGregor (no. 429) on the Banchi Plateau, Northern Nigeria, on December 28, 1928, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

LIPPIA NIGERIENSIS var. **BREVIPELUNCULATA** Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis 4--6-verticillatis brevioribus, supra bullatis, inflorescentiis simplicibus brevioribus.

This variety differs from the typical form of the species in having its leaves regularly in whorls of 4--6, only 3--4.5 cm. long and 4--11 mm. wide, and bullate above, and the inflorescences unbranched and only 1.5--3 cm. long in all.

The type was collected by H. V. Lely (no. P.40) in groups after fires at Banchi, Northern Nigeria, in January 1929, and

is deposited in the herbarium of the Royal Botanic Gardens at Kew.

PAEPALANTHUS FERREYRAE Moldenke, sp. nov.

Herba parva caulescens; caulibus gracilibus brachiatis foliosis, ad apicem longe pilosis; foliis linearibus arcuato-divergentibus, in statu juventute adpresse albedo-pilosis, ad basin longe pilosis, in statu senectute glabrescentibus, non fenestratis non venosis; pedunculis gracillimis solitariis densiuscule albedo-pilosis, pilis adpressis antrorsis; vaginis parce adpresso-pilosis; capitulis hemisphaericis griseis.

Small caulescent herb; stems slender, several-branched, to 5 cm. long, leafy, long-pilose at the apex; leaves all cauline, uniform, light-green, linear, 5--8 mm. long, about 1 mm. wide at the mid-point, arcuate-spreading, appressed white-pilose when young, long-pilose at the base, glabrescent in age, ampliate-sheathing at base, not fenestrate, the midrib indiscernible; peduncles very slender, usually solitary at the apex of each branch, about 3 cm. long, rather densely white-pilose with appressed antrorse hairs; sheath slender, appressed, 1 cm. or less in length, sparsely appressed-pilose with whitish hairs, its rim obliquely split, the blade ovate, erect, about 3 mm. long, acute at the apex; heads hemispheric, gray, about 5 mm. in diameter; involucrel bractlets elliptic, stramineous toward the base, dark-brown toward the apex, about 2.3 mm. long and 1 mm. wide, obtuse or acute at the apex, glabrous on both surfaces, shiny; receptacular bractlets oblong, about 1.5 mm. long and 0.5 mm. wide, triangular-acute at the apex, densely long-pilose with white hairs on the back; staminate florets: sepals 3, spatulate, connate at the base, the free part about 2.3 mm. long and 0.9 mm. wide, dark-brown, subtruncate and 3-denticulate at the apex, long-pilose on the back near the apex; petals 3, connate into a membranous infundibular tube about 2 mm. long; stamens 3; pistillate florets: sepals 3, separate, spatulate, about 2.3 mm. long and 1 mm. wide, whitish toward the base, dark-brown toward the apex, subtruncate and 3-denticulate at the apex, sparsely long-pilose at the very apex; petals 3, free, hyaline, spatulate, about 2.3 mm. long and 1 mm. wide, long-pilose at the apex, eglandular; pistil about 4 mm. long, glabrous, its appendages 3; ovary 3-celled, 3-ovulate.

The type of this species was collected by my good friend and colleague, Dr. Ramon Ferreyra (no. 809) -- in whose honor it is named -- in a stony habitat, altitude 2500--2600 m., above Cutervo, province of Cutervo, Cajamarca, Peru, on July 31, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector records the common name of "achupalia".

PREMIA MADAGASCARIENSIS Moldenke, sp. nov.

Frutex vel arbor parva; ramulis sarmentisque graciusculis griseis obtuse tetragonis lenticellatis minute pulverulento-puberulis vel glabrescentibus; foliis deciduis oppositis; petiolis cinereo-puberulis; laminis membranaceis vel raro charta-

ceis ovatis acuminatis, at basin subtruncatis vel rotundatis vel subcordatis integris vel irregulariter 6--10-dentatis, leviter puberulis vel glabratibus, subtus in axillis dense barbellatis; inflorescentiis cymosis axillaribus densissime multifloris.

Shrub or small tree, 3--4 m. tall; branchlets and twigs rather slender, gray, obtusely tetragonal, lenticellate, minutely pulverulent-puberulent on the younger parts, glabrescent in age; bark grayish-white on older wood; nodes annulate; principal internodes 0.7--2 cm. long; leaf-scars lunate or horseshoe-shaped, corky, often much elevated; leaves deciduous, decussate-opposite; petioles slender, 1--4 cm. long, flattened above, cinereous-puberulent with more or less antrorsely curvate hairs; blades membranous or rarely chartaceous in age, rather uniformly grayish-green on both surfaces or somewhat lighter beneath, ovate, 2.5--10.5 cm. long, 1.5--6.8 cm. wide, acuminate at the apex, varying from subtruncate to rounded or subcordate at the base, entire or coarsely and irregularly dentate with 3--5 obtuse or apiculate broadly triangular teeth on each side near the middle of the margins, very finely and obscurely puberulent or glabrate beneath, usually more densely puberulent along the larger venation and densely barbellate in the axils of the secondaries, glabrate (except for the midrib) above; midrib slender, flat and often puberulent above, prominulous beneath; secondaries very slender, 4--6 per side, ascending, rather irregular, not much arcuate, flat above, prominulous beneath, arcuately joined in many conspicuous loops near the margins beneath; veinlet reticulation very fine, abundant, obscure or conspicuous but not at all elevated above, quite conspicuous but not at all elevated beneath and forming there a very plain and intricate reticulum; inflorescence cymose, axillary; cymes 2 per node, decussate, usually 2 or 3 pairs densely clustered at the tips of the twigs, very densely many-flowered, to about 9.5 cm. long and 7 cm. wide, many times bifurcate; peduncles slender, 1--4 cm. long, very minutely puberulent or glabrescent, stramineous-brownish, antrorsely divaricate, often slightly upwardly curvate; inflorescence-branches 4-angled, similar to the peduncles in all respects, but the upper parts usually more plainly puberulent; bractlets and prophylla usually inconspicuous and linear, to 2 mm. long, puberulent; occasionally a pair of foliaceous bracts present, lanceolate, long-stipitate, to 3 cm. long and 5 mm. wide, sharply attenuate at the apex, subglabrescent; pedicels very short or obsolete; calyx campanulate-tubular, its tube straight, about 1.5 mm. long and 1 mm. wide, minutely and irregularly puberulent-pulverulent, the limb 2-lipped with one lip deeply 2-lobed with the firmly erect lanceolate lobes about 0.8 mm. long, the other lip shallowly 2-toothed with the firmly erect bluntish teeth about 0.5 mm. long; corolla white, hypocrateriform, glabrous on both surfaces, its tube cylindric, straight, about 2.5 mm. long, its limb 4-parted, the lobes oblong-lingulate, about 2 mm. long and 1 mm. wide, obtuse at the apex; stamens 4, inserted about 1.5 mm. above the base of the corolla-tube, subequal, exerted, spreading; filaments filiform, about 2.5 mm. long, glabrous; anthers elliptic, about

0.5 mm. long, 3-celled; pistil slightly exserted; style capillary, about 3.5 mm. long, glabrous; stignas shortly 2-lobed; ovary globose, about 0.5 mm. long and wide, glabrous, 4-celled; fruiting-calyx subpatelliform, about 3 mm. wide, minutely strigillose-puberulent, its rim irregularly and shallowly lobed; fruit subglobose, 4--5 mm. long and wide, fleshy, nigrescent in drying.

The type of this species was collected by Henri Perrier de la Bâthie (no. 10233) in the woods at Marovary, Madagascar, in October 1909, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The species appears to be related to P. acuminata R. Br. of Australia.

PRELINA PERRIERI Moldenke, sp. nov.

Frutex; ramulis gracilibus griseis obtuse tetragonis valde lenticellatis cinereo-tomentellis; sarmentis densissime brunneo-tomentellis; foliis oppositis deciduis; petiolis densissime brunneo- vel flavido-tomentellis; laminis submembranaceis ovatis acuminatis, ad basin rotundatis vel subcordatis, supra plusminusve pubescentibus, subtus dense brunneo-pubescentibus.

Shrub 3--4 m. tall; branchlets slender, grayish, obtusely tetragonal, conspicuously lenticellate, cinereous-tomentellous, less so in age; nodes indistinctly annulate; principal internodes 0.5--3 cm. long; twigs similar to the branchlets but very densely brownish-tomentellous; leaves deciduous, decussate-opposite; petioles slender, 1--3 cm. long, very densely brownish- or yellowish-tomentellous; blades thin-chartaceous or submembranous, dark-green and brunnescens above, much lighter beneath, ovate, 4--7.5 cm. long, 2.5--6.3 cm. wide, acuminate at the apex, rounded or subcordate at the base, more or less scattered-pubescent above with brownish hairs, more densely so along the midrib and secondaries, even more densely so beneath, entire; midrib slender, plane above, prominulous beneath, rapidly diminishing in size toward the apex; secondaries very slender, 4--6 per side, ascending, hardly at all arcuate but arcuately joined in many loops near the margins, plane (and often conspicuous because of the pubescence) above, subprominulous beneath; veinlet reticulation very numerous and fine, obscure or indiscernible above, plain but not at all elevated beneath; inflorescence cymose, terminal, about 3.5 cm. long, 3.5--4.5 cm. wide, densely many-flowered, composed of about 2 pairs of inconspicuously branched cymes; pedicels obsolete; calyx campanulate, densely short-pubescent, its tube about 2 mm. long and wide, its limb 2-lipped, one lip deeply 3-lobed with triangular elongate erose-margined acute lobes about 1.5 mm. long, the other lip shallowly 2-dentate with the teeth only about 1 mm. long; corolla hypocrateriform, glabrous on the outer surface, densely villous-tomentose in the throat within, its tube broadly cylindric, about 2 mm. long, its limb 4-parted, the lobes lingulate, about 2 mm. long and 1 mm. wide, rounded at the apex; stamens 4, didynamous, inserted about 1 and 1.5 mm. above the base of the corolla-tube, exserted; filaments filiform, about 3 mm. long, glabrous; anthers elliptic, about 0.7 mm. long.

2-celled; pistil slightly exerted; style capillary, about 4.5 mm. long, glabrous; stigma shortly 2-lobed; ovary globose, about 0.8 mm. long and wide, glabrous, 4-celled; fruiting-calyx and fruit not seen.

The type of this distinct species was collected by Henri Perrier de la Bâthie (no. 15075) -- in whose honor it is named -- at an altitude of 600 m. in the neighborhood of Antsakabary, Madagascar, in September 1922, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The plant has much the superficial aspect of a *Viburnum*.

PRIVA LEYERI var. MADAGASCARIENSIS Moldenke, var. nov.

Hæc varietas a forma typica speciei seminibus brevissime spinosis recedit.

This variety differs from the typical form of the species in having decided, although few and very short, spines on its cocci.

The type of the variety was collected by Henri Humbert (no. 6732) on gneiss rocks in the upper basin of the Mandrare, on the promontory of Vavara to the valley of the Manambolo, at an altitude of 700--1200 m., in southeast Madagascar between November 20 and 22, 1928, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

REYNOUITRIA JAPONICA var. RUBRA Moldenke, var. nov.

Hæc varietas a forma typica speciei floribus rubris recedit.

This variety differs from the typical form of the species in having deep-red flowers.

The type was collected in outdoor cultivation at 6 Fairfield Street, White Plains, Westchester County, New York, by Mrs. F. R. White on October 3, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden.

STACHYTARPHETA MACEDOII Moldenke, sp. nov.

Herba parva annua; caulibus gracilibus rectis simplicibus vel pauca brachiatis acute tetragonis glabris; foliis oppositis parvis sessilibus; laminis chartaceis adscendentibus lanceolatis obtusis vel subacutis integris vel obscure denticulatis, ad basin truncatis vel subcordatis, utrinque glabris subrevolutis.

Small herb, apparently annual, to 40 cm. tall; stems slender, simple or with 2 branches above, erect, acutely tetragonal, glabrous, green or purplish, the angles slightly margined; branches none or to 2, erect, similar to the stems in all respects; nodes annulate, often with a band of spreading whitish hairs; principal internodes 0.8--3.8 cm. long; leaves decussate-opposite, sessile, small; blades chartaceous, rather uniformly green on both surfaces, rather firmly ascending, lanceolate, 1.4--3.4 cm. long, 2--5 mm. wide, obtuse or subacute at the apex, entire or very obscurely and sparsely denticulate, truncate or subcordate at the base, glabrous on both surfaces or with a very few widely scattered pilose hairs, often slightly subrevolute along the margins beneath; midrib very slender, plane or obscure above, subprominulous beneath; secondaries ob-

scure; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, spicate, 11--20 cm. long, densely many-flowered, the flowers and fruits imbricate and appressed; peduncles slender, 1--1.5 cm. long, tetragonal, green, glabrous; rachis green, glabrous or practically so; bractlets lanceolate-ovate, about 3 mm. long, acuminate at the apex, glabrous or subglabrous; calyx cylindric, about 4 mm. long, its teeth about 1 mm. long, glabrate; corolla lilac or bluish, its tube about 5 mm. long, glabrous on the outside, its limb about 4 mm. wide.

The type of this unique species was collected by Amado Macedo (no. 1647) -- in whose honor it is named -- in the "resfriado" (very dry untilted periodically flooded ground) at São Terézinha, município Ituiutaba, Minas Geraes, Brazil, on February 11, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS DENSUS var. **PUMILUS** Moldenke, var. nov.

Haec varietas a forma typica speciei foliis usque ad 1 cm. et pedunculis usque ad 5.5 cm. longis recedit.

This variety differs from the typical form of the species in having its leaves only to 1 cm. long and its peduncles to 5.5 cm. long.

The type was collected by Philipp von Luetzelburg (no. 20568 in part) at Passarão on the Rio Araricuera, Amazonas, Brazil, and is no. 47668 in the herbarium of the Museu Nacional at Rio de Janeiro.

SYNGONANTHUS KUHLMANNII Moldenke, sp. nov.

Herba acaulescens; foliis dense rosulatis appressed vel reflexis anguste linearibus supra glabris, subtus dense piloso-pubescentibus, ad basin lanatis, ad apicem attenuato-subulatis, brunnescentibus non fenestratis; vaginis arcte adpressis irregulariter longae pilosis; pedunculis numerosis 3-costatis glabris nitidis vel basin versus paucae longae pilosis.

Acaulescent herb to 26 cm. tall; leaves densely rosulate, appressed to the ground or reflexed, narrowly linear, 2--3.5 cm. long, about 1 mm. wide at the mid-point, glabrous above, densely pilose-pubescent beneath, lanate at the hidden base, attenuate-subulate at the apex, brunnescent in drying, thin-textured but not fenestrate, the midrib prominent beneath; sheaths closely appressed, about 2.5 cm. long, irregularly long-pilose, obliquely split at the apex, the blade erect, about 5 mm. long, acuminate, its more or less subulate tip often divergent-reflexed; peduncles numerous, 15 or more per plant, erect, firm, stramineous, 20--25 cm. long, 3-costate, glabrous and shiny or with a few scattered long-pilose hairs toward the base; heads white, hemispheric, 6--7 mm. wide; involucrel bractlets stramineous, spatulate, firm, about 2 mm. long and 1 mm. wide, rounded at the apex, glabrous, shiny; receptacle densely white-villous; receptacular bractlets subhyaline, oblanceolate-spatulate, about 2 mm. long and 0.7 mm. wide, obtuse at the apex, glabrous; staminate florets: sepals 3, connate at the base only or for half their length into a filiform tube,

the free apical part hyaline, elliptic, about 1.7 mm. long and 0.5 mm. wide, gradually attenuate to the acute apex, glabrous; petals 3, connate into a subhyaline tube about 1 mm. long; stamens 3, included; anthers yellow; pistillate florets: sepals 3, free and separate, hyaline, subfalcate-lanceolate, about 2 mm. long and 0.4 mm. wide, attenuate-acute, glabrous; petals 3, connate at the middle, hyaline, about 1 mm. long, attenuate to the apex, glabrous; pistil about 0.8 mm. long, glabrous; ovary 3-celled.

The type of this species was collected by my good friend and respected colleague, Dr. João Geraldo Kuhlmann (no. 1635) -- in whose honor it is named -- in sandy varzea land between Zocahariuna and Utiauina (Buriti and Rio de Calôr), Mattogrosso, Brazil, in May 1918, and is deposited in the herbarium of the Museu Nacional at Rio de Janeiro.

VERBENA BERTERII f. *ALBIFLORA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by Ellsworth Paine Killip and Edmundo Pisano (no. 39711) on an open hillside, at an altitude of about 600 m., between Curacavi and Casablanca, on the western slope of the Cuesta de Zapata, Valparaiso, Chile, on November 3, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA BRASILIENSIS var. *SUBGLABRATA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit caulibus ramisque glabris vel subglabratissimis nitidisque, inflorescentiis unifloris bis trifurcatis, pedunculis primariis glabris vel subglabratissimis, pedunculis secundariis rhachidisque puberulis, bracteolis non ciliatis minutissime obscureque puberulis vel glabrescentibus, calicibus minute puberulis non strigosis.

This variety differs from the typical form of the species in having its branches and stems glabrous or subglabrate and nitid, its inflorescences uniformly twice trifurcate, the primary peduncles glabrous or subglabrate, the secondary peduncles and rachis puberulent, the bractlets non-ciliate, very minutely and obscurely puberulous or glabrescent, the calyxes very minutely puberulent and not at all strigose.

The type was collected by Ernesto Barros V. (no. 8050) at San Fernando, Colchagua, Chile, on February 7, 1930, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA CLAVATA f. *ALBIFLORA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by Ramón Ferreyra (no. 2507) in a sandy habitat between 300 and 350 m. altitude between Nazca and Chala, Arequipa, Peru, on November 7, 1947, and is deposited in

the Britton Herbarium at the New York Botanical Garden.

VERBENA FERREYRAE Moldenke, sp. nov.

Herba; caulibus ramisque rectis vel adscendentibus obtuse tetragonis brunnescentibus parviscule albido-puberulis; foliis oppositis sessilibus tripartitis revolutis supra parce puberulento-pilosulis, subtus dense puberulis, segmentis pinnato-partitis vel -incisis; inflorescentiis terminalibus spicatis plerumque ternatis dense multifloris.

Herb; stems and branches erect or ascending, obtusely tetragonal, brunnescent in drying, rather sparsely puberulent with weak, irregular, whitish hairs, the former rather stoutish, the latter quite slender; nodes annulate; principal internodes 2--6.3 cm. long; leaves decussate-opposite, sessile, uniformly bright-green on both surfaces, the immature ones often brunnescent in drying, 3-parted almost to the base, 3--6 cm. long and wide, the 3 divisions again pinnately parted and incised, the lobes rather thick and acute, the segments irregular in diameter, usually increasing in diameter toward the leaf-base and there often to 8 mm. wide, revolute-margined, rather sparsely puberulent-pilosulous above, becoming glabrescent in age, more densely puberulent beneath, the single vein in each segment mostly subimpressed above and prominulous beneath, extending to the apex of each lobe; inflorescence terminal, that at the apex of the main stems usually ternate, spicate, densely many-flowered; peduncles slender, 1.5--4 cm. long, densely short-pubescent with reflexed whitish hairs; floriferous portion of the inflorescence usually conic before anthesis, capitate in anthesis, and elongate to 4 or more cm. after anthesis, very dense; bractlets oblong-linear, 6--8 mm. long, rather densely puberulent; calyx tubular, about 6 mm. long, 5-costate, rather densely short-pubescent, its rim 5-apiculate; corolla sky-blue, hypocrateriform, its tube about 8 mm. long, its limb about 9 mm. in diameter, densely pilose in the throat.

The type of this species was collected by my good friend and colleague, Dr. Ramón Ferreyra (no. 5491) -- in whose honor it is named -- in a stony habitat, 3200--3300 m. altitude, above Puquio, province of Lucanas, Ayacucho, Peru, on March 19, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA LUCANENSIS Moldenke, sp. nov.

Herba; caulibus ramisque rectis vel adscendentibus; ramis ramulisque gracilibus obtusiuscule tetragonis dense breviterque albido-pubescentibus; foliis oppositis sessilibus; laminis chartaceis ovatis profunde tripartitis, segmentis profunde irregulariterque dissectis utrinque dense puberulis subrevolutis obtusis vel acutis; inflorescentiis breviter spicatis vel subcapitatis dense multifloris; bracteolis lanceolatis puberulis.

Herb, with erect or ascending stems and branches; stems and branches slender, rather obtusely tetragonal, densely short-pubescent with whitish spreading hairs; nodes not annulate; principal internodes 0.5--4.2 cm. long; leaves decussate-oppo-

site, usually with a dense cluster of small ones on abbreviated twigs in their axils; petioles obsolete; blades chartaceous, rather uniformly bright-green on both surfaces, the immature ones more or less brunnescent in drying, ovate in outline, 1--4 cm. long and wide, deeply 3-parted, the divisions again deeply and rather irregularly parted or dissected, the lamina-segments 0.5--2.5 mm. wide, rather densely puberulent on both surfaces, the margins subrevolute, obtuse or acute at the apex, the single vein in each segment impressed above, prominulous beneath; inflorescence terminal and in the upper axils, short-spicate or subcapitate, to 3.5 cm. long, densely many-flowered; peduncles very slender, 4--15 mm. long, densely spreading-pubescent like the branches; bractlets lanceolate, about 3 mm. long and 1 mm. wide, gradually attenuate to the apex, densely puberulent; calyx tubular, 3--4 mm. long, densely puberulent, its rim 5-toothed, the teeth narrow attenuate; corolla purple, hypocrateriform, its tube 6--7 mm. long, very lightly puberulous on the outside toward the apex, its limb about 6 mm. in diameter; fruiting-calyx not inflated, easily splitting into 5 similar segments; cocci 4, oblong, about 2 mm. long, glabrous, shiny, the dorsal surface uniformly scrobiculate-ridged, the commissural surface white-papillose for the lower 2/3 only.

The type of this distinct species was collected by Ramón Ferreyra (no. 5493) in stony habitats, 1500--2000 m. altitude, between Nazca and Puquio, province of Lucanas, Ayacucho, Peru, on March 19, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA OCCULTA Moldenke, sp. nov.

Herba; caulibus ramisque rectis vel adscendentibus brunnescentibus obtuse tetragonis adpresso-pilosulis vel breviter pubescentibus; foliis oppositis plusminusve amplexicaulibus sessilibus profunde tripartitis utrinque dense pubescentibus, segmentis plerumque parce dentatis vel breviter lobatis.

Herb; stems and branches erect or ascending, brunnescent, obtusely tetragonal, appressed-pilosulous on the older parts, short-pubescent with spreading hairs on the younger parts; nodes annulate; principal internodes 0.5--3 cm. long; leaves decussate-opposite, sessile, more or less clasping-based; petioles obsolete; blades deeply 3-parted to about the middle, uniformly dark-green on both surfaces, brunnescent in drying, thin-chartaceous, very fragile in drying, densely pubescent on both surfaces with subappressed hairs of irregular length, the divisions often few-toothed or short-lobed, the lobes subacute, somewhat revolute-margined, the single vein in each segment flat or obscure above, prominulous beneath; inflorescence terminal, spicate, abbreviated, 1.5--4 cm. long, densely many-flowered; peduncles obsolete or to 2 cm. long, spreading-pubescent; bracts few, foliaceous, oblong, to 12 mm. long and 2 mm. wide; bractlets large and conspicuous, surpassing and mostly hiding the calyx, 8--10 mm. long, lanceolate, attenuate at the apex, rather densely appressed-pubescent; calyx about 5 mm. long, irregular, densely pubescent, its rim 5-lobed; corolla

purple, hypocrateriform, its tube 8--10 mm. long, its limb 4--5 mm. wide.

The type of this curious species was collected by Ramón Ferreyra (no. 1298) in a stony habitat, altitude 3200--3500 m., near Nevado Cajamarquilla, province Bolívar, La Libertad, Peru, on September 12, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA PULCHELLA f. *LATILOBATA* Moldenke, f. nov.

Haec forma a forma typica speciei recedit segmentis foliorum latissimis 3--7 mm. latis ad apicem obtusis.

This form differs from the typical form of the species in having its leaf-segments very broad, 3--7 mm. wide, and obtuse at the apex.

The type was collected by Mariano B. Berro (no. 4751) at Barra Santa Lucia, dept. Montevideo, Uruguay, on October 30, 1907, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA SULPHEREA var. *TALTALENSIS* Moldenke, var. nov.

Haec varietas a forma typica speciei suis elongatis 4.5--10 cm. longis recedit.

This variety differs from the typical form of the species in having its spikes elongated, 4.5--10 cm. long.

The type was collected by Ernesto Barros V. (no. 8032) at Taltal, Antofagasta, Chile, on September 26, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA TRIFIDA var. *DESERTICOLA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit planta diffusa valde brachiata ramis gracilioribus valde debilibus et segmentis foliorum uniforme oblongis vel linearibus 1--3 mm. latis obtusioribus.

This variety differs from the typical form of the species in being a more branched and diffuse plant, with more slender and much weaker branches, and with the divisions of the leaves uniformly oblong or linear, 1--3 mm. wide, and more obtuse at the apex.

The type of the variety was collected by Ernesto Barros V. (no. 8010) at Quebrada La Chimba, Antofagasta, Chile, on September 20, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden. The surprising number of novelties contained in recent collections sent to me from Chile and Peru is a good indication of the amount of work of exploratory nature that remains to be done by taxonomic botanists and collectors in these countries. The same may be said for Ecuador, parts of Brazil and Argentina, the mountainous sections of Venezuela and the Guianas, Madagascar, Nigeria, Rhodesia, and other parts of Africa. It is hoped that as more botanical collectors penetrate into these regions and send their material to specialists in the various plant groups, our knowledge of the flora of these lands may gradually become more complete.

A NEW VARIETY OF ARENARIA

Wilbur H. Duncan

ARENARIA LANUGINOSA var. LONGIPEDUNCULATA Duncan, var. nov.

Hec varietas a forma typica speciei recedit foliis 4--7 mm. latis, pedunculis 3.8--5.2 cm. longis, calicibus 4.8--6.5 mm. longis, capsula excedentibus, seminibus minute papillatis.

DeKalb and Fulton Counties, Georgia: type collected in shallow soil on shelf near top of granite rock cliff in deep woods, on the south side of the Chattahoochee River, east of Marsh Creek, Fulton County, W. H. Duncan 9701, 5 June 1949, deposited in the Britton Herbarium at the New York Botanical Garden. The other collection is from DeKalb County, in shallow soil on rocky slopes on the north side of Stone Mountain, Pyron & McVaugh 2765, 1 May 1938, deposited in the University of Georgia Herbarium.

In typical Arenaria lanuginosa (Michx.) Rohrb. the leaves are from 3 to 7 mm. wide (the largest on each plant averaging 5.3); the peduncles (with mature capsules) are from 2 to 3.7 (average 2.8) cm. long; the calyx is 3--4.6 (average 3.6) mm. long; the capsules equal or exceed the length of the calyx; and the seeds are smooth to slightly roughened. In var. longipedunculata the leaves are 4 to 7 mm. wide (the largest on each plant averaging 6.6); the peduncles (with mature capsules) are 3.8 to 5.2 (average 4.7) cm. long; the calyx is from 4.8 to 6.5 (average 5.6) mm. long; the capsules are exceeded by the calyx; and the seeds are roughened, the minute raised areas usually being slightly elongated with the longer axis of the seed.

Although the typical A. lanuginosa occupies a variety of habitats, including woods, it is not known to occur on granite ledges that typify the habitat of the variety, and rarely occurs in closely similar habitats.

Data for the typical A. lanuginosa are based on measurements of twenty collections from the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, and Texas. The data for the variety are based on the one collection from DeKalb County and thirteen plants from the type locality in Fulton County, Georgia. Certain facilities used in this study were provided by the New York Botanical Garden. Dr. Basset Maguire contributed helpful suggestions. I, however, assume full responsibility for the entire manuscript.

Department of Botany
University of Georgia

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, and
ERIOCAULACEAE. SUPPLEMENT 1

Harold N. Moldenke

Several thousand additional specimens studied since the typescript of my booklet entitled "The known geographic distribution of the members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae" went to press have brought to light the following new records, together with several corrections. In all, 226 country or island records, 317 state, province or department records, and 31 county or parish records are listed here for the first time. The material on which these new records are based is deposited in the Government Herbarium at Salisbury, Southern Rhodesia, the Erik Wall Herbarium at Stockholm, the Krukoff Herbarium at the New York Botanical Garden, and the herbaria of the Royal Botanic Gardens at Kew, Museu Nacional at Rio de Janeiro, Muséum National d'Histoire Naturelle at Paris, Instituto Botânico at São Paulo, Museo Comercial de Venezuela at Caracas, Museo de Historia Natural at Montevideo, Trinidad and Tobago Botanical Garden at Port-of-Spain, Naturhistoriska Riksmuseet at Stockholm, Parque Nacional da Serra dos Orgãos at Teresopolis, University of Kansas at Lawrence, and the Britton Herbarium at the New York Botanical Garden.

CANADA:

Ontario:

Verbena simplex Lehm. [Carleton County]

UNITED STATES OF AMERICA:

New York:

Eriocaulon septangulare With. -- delete "Tioga County"

Verbena hastata L. [Chemung, Ontario, Steuben, Tioga, & Wayne Counties]

Verbena officinalis L. [Bronx County]

Verbena urticifolia L. [Ontario & Steuben Counties]

Verbena urticifolia var. leiocarpa Perry & Fernald [Steuben County]

Florida:

Phyla nodiflora (L.) Greene [Orange County]

Vitex Agnus-castus f. alba (West.) Rehd. [Highlands County]

Vitex Agnus-castus var. alba West. -- to be deleted

Indiana:

Verbena hastata L. [Henry County]

Verbena urticifolia var. leiocarpa Perry & Fernald [Huntington & Owen Counties]

Kansas:

Phyla cuneifolia (Torr.) Greene [Garden County]

Verbena bracteata Lag. & Rodr. [Bourbon & Greenwood Counties]

Verbena canadensis (L.) Britton [Butler County]

Verbena hastata L. [Cherokee & Harvey Counties]

~~x~~Verbena moenchina Moldenke [Greenwood & Leavenworth Counties]

~~x~~Verbena Rydbergii Moldenke [Chautauqua & Leavenworth Counties]

Missouri:

Gallicarpa americana L. [Taney County]

Texas:

Clerodendrum indicum (L.) Kuntze [Jasper County]

Phyla nodiflora var. rosea (D. Don) Moldenke [Brewster County]

Vitex Agnus-castus f. alba (West.) Rehd. [Travis County]

Vitex Agnus-castus var. alba West. -- to be deleted

Arizona:

Verbena tenuisecta Briq. [Pima County]

California:

Verbena robusta Greene [Orange County]

CHANNEL ISLANDS:

Verbena robusta Greene [Angel, San Clemente, San Miguel, Santa Catalina, Santa Cruz, & Santa Rosa]

delete ANGEL ISLAND, SANTA CATALINA ISLANDS, and SANTA CRUZ ISLAND as separate headings

MEXICO:

Citharexylum Donnell-Smithii Greenm. [Chiapas]

Citharexylum Sessaei D. Don [San Luis Potosí]

~~x~~Verbena hybrida Voss [Nuevo Leon]

GUATEMALA:

Eriocaulon Ehrenbergianum Klotzsch [El Quiché & Sacatepéquez]

Phyla scaberrima (A. L. Juss.) Moldenke [Guatemala]

HONDURAS:

Lantana glandulosissima Hayek [Morazán]

Lantana hirta Grah. [Morazán]

Stachytarpheta Frantzii Polak. [Morazán]

Verbena litoralis H.B.K. [Morazán]

ST. LUCIA:

Lantana Canara var. aculeata (L.) Moldenke

Stachytarpheta urticaefolia (Salisb.) Sims

GRENADE:

Stachytarpheta urticaefolia (Salisb.) Sims

TORTUGA:

Lantana involucrata L.

COLOMBIA:

Aegiphila grandis Moldenke [Antioquia]

Aegiphila hirsutissima Moldenke [Antioquia]

Aegiphila longifolia Turcz. -- delete the asterisk

Cornutia microcalycina var. anomala Moldenke [Caldas]

Cornutia odorata var. calvescens Moldenke [Caldas]

Lantana amata Schau. [Caldas]

Lantana Canara L. [Cundinamarca & Vichada]

Lantana cujabensis Schau. [Caldas]

- Lantana cujabensis var. punctata Moldenke [Santander]
Lantana glandulosissima Hayek [Cauca]
Lantana trifolia L. [Bolívar]
Lippia americana L. [Santander]
Paepalanthus muscosus Körn. [Valle del Cauca]
Phyla scaberrima (A. L. Juss.) Moldenke [Caldas]
Stachytarheta cayennensis (L. C. Rich.) Vahl [Amazonas]
Vitex capitata Vahl [Bolívar]

VENEZUELA:

- Eriocaulon atabapense Moldenke -- delete the asterisk
Lantana glandulosissima Hayek [Federal District]
Lantana maxima Hayek [Mérida & Trujillo]
Lantana Pittieri Moldenke [Federal District]*
Lantana rugulosa H.B.K. -- to be deleted
Lippia alba (Mill.) N. E. Br. [Falcón]
Paepalanthus tortilis (Bong.) Mart. [Lará]
Petrea pubescens Turcz. [Carabobo]
Phyla nodiflora (L.) Greene [Federal District]
Phyla nodiflora var. reptans (H.B.K.) Moldenke [Miranda & Paraguáná]
Stachytarheta angustifolia (Mill.) Vahl [Paraguáná]
Stachytarheta mutabilis (Jacq.) Vahl [Zulia]
Stachytarheta roraimensis var. pubescens Moldenke -- delete the asterisk
Stachytarheta trinitensis Moldenke [Paraguáná]
Syngonanthus biformis (N. E. Br.) Gleason [Sucre]
Syngonanthus caulescens (Poir.) Ruhl. [Anzoátegui]
Syngonanthus gracilis var. aureus Ruhl.
Tonina fluviatilis Aubl. [Anzoátegui]
Verbena tenuisecta Briq. [Federal District]
Vitex calothyrsa Sandw. [Amazonas]
Vitex capitata Vahl [Barinas & Carabobo]
Vitex compressa Turcz. [Anzoátegui]

BRITISH GUIANA:

- Eriocaulon atabapense Moldenke
Ghinia spicata (Aubl.) Moldenke
Stachytarheta roraimensis var. pubescens Moldenke

SURINAM:

- Paepalanthus polytrichoides f. villosus Moldenke -- delete the asterisk

ECUADOR:

- Aegiphila bogotensis var. aequinoctialis Moldenke [Azuay]*
Aegiphila chrysantha Hayek [Chimborazo]
Aegiphila ferruginea Hayek & Spruce [Azuay]
Aegiphila integrifolia (Jacq.) Jacks. [Santiago-Zamora]
Aegiphila pendula Moldenke [Bolívar, Cañar, Chimborazo, Guayas, & Santiago-Zamora] -- delete "Oriente"
Aegiphila purpurascens Moldenke [Azuay]*
Aegiphila Schimpffii Moldenke [Bolívar, Cañar, & Chimborazo]

-- the correct orthography of this specific name is as here given.

- Avicennia nitida Jacq. [Bolivar]
Citharexylum montanum var. chimboraense Moldenke [Chimborazo]*
Cormatia microcalycina var. pulverulenta Moldenke [Bolivar & Cañar]
Duranta coriacea Hayek [Chimborazo]
Duranta Dombeyana Moldenke [Chimborazo]
Duranta Mutisii L. f. [Cañar]
Duranta repens L. [Loja]
Eriocaulon microcephalum H.B.K. [Azuay]
Lantana Moritziana Otto & Dietr. [Pichincha]
Lantana scabiosaeiflora H.B.K. [Chimborazo]
Lantana scabiosaeiflora f. albida Moldenke [El Oro]*
Lantana trifolia L. [Bolivar, Cañar, & Chimborazo]
Petrea pubescens var. Klugii Moldenke [Santiago-Zamora]*
Priva lappulacea (L.) Pers. [Guayas & Los Rios]
Syngonanthus yacuambensis Moldenke [Azuay]*
Verbena demissa Moldenke [Azuay & Cañar]*
Verbena litoralis H.B.K. [Cañar & Pichincha]

PERU:

- Aloysia minthiosa Moldenke [Lima]
Callicarpa longifolia Lam. [Lima]
Junellia juniperina var. grisea (I. M. Johnst.) Moldenke [Ayacucho]
Lantana cujabensis Schau. [Huánuco]
Lantana Fiebrigii Hayek [Huánuco]
Lantana Zahlbruckneri Hayek [Cajamarca & Lima]
Paenalanthus crassicaulis Körn. [Cajamarca]
Paenalanthus Ferreyrae Moldenke [Cajamarca]*
Petrea pubescens var. Klugii Moldenke -- delete the asterisk
Phyla strigulosa (Mart. & Gal.) Moldenke [Cajamarca]
Verbena clavata f. albiflora Moldenke [Arequipa]*
Verbena Ferreyrae Moldenke [Ayacucho]*
Verbena glabrata H.B.K. [Lima]
Verbena lucanensis Moldenke [Ayacucho]*
Verbena Matthewsii Briq. [Ayacucho]
Verbena microphylla H.B.K. [Ayacucho]
Verbena occulta Moldenke [La Libertad]*

BRAZIL:

- Aegiphila Lhotzkiana Cham. [Pará]
Aegiphila longifolia Turcz. [Amazonas]
Aegiphila Luischnathi Schau. [Federal District]
Aloysia virgata var. platyphylla (Briq.) Moldenke [Paraná]
Avicennia Schaueriana Stapf & Leechman [Federal District]
Bouchea cinoensis Moldenke [Minas Geraes]*
Citharexylum Glaziovii Moldenke [Ceará]
Citharexylum laetum Hiern [Federal District]
Citharexylum myrianthum Cham. [Santa Catharina]

- Citharexylum Poeppigii var. margaritaceum Poepp. & Moldenke [Pará]
- Clerodendrum indicum (L.) Kuntze [Federal District]
- Clerodendrum japonicum (Thunb.) Sweet [Pará]
- Duranta vestita Cham. [São Paulo]
- Eriocaulon leptophyllum Kunth [Paraná]
- Eriocaulon magnificum Ruhl. [São Paulo]
- Eriocaulon modestum Kunth [Rio Grande do Sul]*
- Eriocaulon pterosepalum Herzog [Amazonas]
- Lantana brasiliensis Link [Rio de Janeiro]
- Lantana Camara L. [Amazonas]
- Lantana Camara var. aculeata (L.) Moldenke [Federal District]
- Lantana Fiebrigii Hayek [Mattogrosso]
- Lantana glutinosa Poepp. [Rio de Janeiro]
- Lantana minasensis Moldenke [São Paulo]
- Lantana Pohliana Schau. [Federal District]
- Lantana radula Sw. [Federal District, Parahyba, Rio de Janeiro, & Rio Grande do Sul]
- Lantana robusta Schau. [Federal District]
- Lantana Salzmanni Schau. [Rio de Janeiro]
- Lantana tiliaefolia Cham. [Ceará, Federal District, Maranhão, & Parahyba]
- Lantana trifolia var. rigidiuscula Briq. [Rio de Janeiro]
- Leiothrix Becklii (Szysz.) Ruhl. [Rio de Janeiro]
- Leiothrix hirsuta (Wikstr.) Ruhl. [Federal District & Rio de Janeiro]
- Lippia asperima var. rotundata Moldenke -- delete the asterisk
- Lippia gracilis Schau. [Amazonas]
- Lippia lupulina Cham. [Amazonas]
- Lippia polycephala Briq. -- delete the asterisk
- Lippia primulina var. goyazensis S. Moore [Minas Geraes]
- Lippia Schaueriana Mart. [Bahia]
- Lippia turnerifolia Cham. [São Paulo]
- Lippia turnerifolia var. angusta Kuntze -- to be deleted
- Paepalanthus bifidus (Schröd.) Kunth [Alagoas]
- Paepalanthus capillaceus Klotzsch [Amazonas]
- Paepalanthus chloronema Alv. Silv. [Mattogrosso]
- Paepalanthus corymboides var. epilosus Ruhl. [Paraná]
- Paepalanthus coutoensis Moldenke [Federal District]
- Paepalanthus cristatus Moldenke -- to be deleted
- Paepalanthus Dusenii Ruhl. -- to be deleted
- Paepalanthus fasciculatus f. tenellus Herzog [Amazonas]
- Paepalanthus Lamarckii Kunth [Amazonas]
- Paepalanthus planifolius (Bong.) Körn. [Paraná]
- Paepalanthus polyanthus (Bong.) Kunth [Rio de Janeiro]
- Paepalanthus polyanthus var. villosus Beauverd [Federal District & Rio de Janeiro]
- Paepalanthus polytrichoides f. villosus Moldenke [Mattogrosso]

so]

- Paepalanthus ramosus (Wikstr.) Kunth [Rio de Janeiro]
Paepalanthus Ruhlmannii Alv. Silv. [Paraná & São Paulo]
Paepalanthus salticola Herzog [Rio Grande do Norte]
Paepalanthus Schuechianus Körn. -- this is the correct orthography of this binomial
Paepalanthus Tessmannii Moldenke [Paraná]*
Paepalanthus vigiensis Moldenke [Pará]*
Paepalanthus villipes Moldenke [Pará]*
Potrea Swalleni Moldenke [Amazonas]
Philodice Hoffmannseggii Mart. [Amazonas]
Stachytarpheta elatior Schrad. [Federal District & Minas Geraes]
Stachytarpheta Froesii Moldenke [Bahia]*
Stachytarpheta hispida Nees & Mart. [Alagoas]
Stachytarpheta Macedoi Moldenke [Minas Geraes]*
Stachytarpheta Maximiliani var. ciliaris Moldenke [Federal District]
Stachytarpheta Maximiliani var. glabrata Schau. [Federal District]
Stachytarpheta simplex Hayek [Minas Geraes]
Syngonanthus Baldwini Moldenke [Amazonas]*
Syngonanthus bellus Moldenke [Pará]*
Syngonanthus biformis (N. E. Br.) Gleason [Amazonas & Matto-grosso]
Syngonanthus glandulosus Gleason [Amazonas]
Syngonanthus gracilis (Körn.) Ruhl. [Amazonas]
Syngonanthus gracilis var. aureus Ruhl. [Amazonas, Piahy, & São Paulo] -- delete the asterisk
Syngonanthus gracilis var. Koernickeanus Ruhl. [Amazonas]
Syngonanthus habrophyus Ruhl. [Federal District]
Syngonanthus densus var. pumilus Moldenke [Amazonas]*
Syngonanthus Huberi Ruhl. [Amazonas]
Syngonanthus Kuhlmannii Moldenke [Mattogrosso]*
Syngonanthus nanus Moldenke [Paraná]*
Syngonanthus niveus (Bong.) Ruhl. [Federal District]
Syngonanthus oblongus (Körn.) Ruhl. [Amazonas, Mattogrosso], delete the asterisk
Syngonanthus xeranthemoides (Bong.) Ruhl. [Paraná]
Tonina fluviatilis Aubl. [Rio de Janeiro]
Verbena Balansae Briq. [Santa Catharina]
Verbena brasiliensis Vell. [Federal District]
Verbena campestris Moldenke [Santa Catharina]
Verbena corymbosa Ruiz & Pav. [Santa Catharina]
Verbena filicaulis Schau. [Santa Catharina]
xVerbena hybrida Voss [Minas Geraes]
Verbena incisa Hook. [Santa Catharina]
Verbena intermedia Gill. & Hook. [Rio Grande do Sul]
Verbena lobata Vell. [Santa Catharina]

- Verbena lobata var. glabrata Moldenke -- delete the asterisk
Verbena megapotaica Spreng. [Santa Catharina]
Verbena nana Moldenke [Paraná]
Verbena Reitzii Moldenke [Santa Catharina]*
Verbena storeoclada Briq. [Paraná]
Verbena tenera Spreng. [Paraná]

BOLIVIA:

- Priva boliviana Moldenke [Santa Cruz]*
~~x~~Verbena Dermeni Moldenke [La Paz]

PARAGUAY:

- Lantana Jörgenseni Moldenke -- to be deleted
Lippia lupulina var. paraguariensis Chod.*
Lippia phaeocephala Briq. -- delete the asterisk
Lippia polycephala Briq.
Lippia recolletae var. Balansae Chod.*
Lippia villafloridana Kuntze -- delete the asterisk
Verbena bonariensis var. brevibracteata Kuntze -- to be deleted
~~x~~Verbena Dermeni Moldenke
Verbena nana Moldenke
Verbena tenuisecta var. alba Moldenke

URUGUAY:

- Aloysia Schulziana Moldenke
Eriocaulon modestum Kunth -- to be deleted
Eriocaulon Moldenkei Herter*
Lantana Larranagae Moldenke -- to be deleted
Lantana virgata Larrañ. -- to be deleted
Lippia phaeocephala Briq.
Lippia villafloridana Kuntze
Verbena aristigera S. Moore
Verbena intercedens Briq.
Verbena laciniata (L.) Briq.
Verbena lobata Vell.
Verbena lobata var. glabrata Moldenke
Verbena mendocina R. A. Phil.
Verbena microphylla H.B.K.
Verbena parviflora Larrañ. -- to be deleted
Verbena peruviana var. glabriuscula Kuntze
Verbena pinnatiloba (Kuntze) Moldenke
Verbena pulchella f. latilobata Moldenke*
Verbena pulchra Moldenke
Verbena sorbiculata Griseb.
Verbena stellarioides Cham.

CHILE:

- Junellia glauca (Gill. & Hook.) Moldenke [Antofagasta & Coquimbo]
Junellia seriphioides (Gill. & Hook.) Moldenke [Antofagasta]
Junellia thymifolia (Lag.) Moldenke [Coquimbo]
Phyla nodiflora var. canescens (H.B.K.) Moldenke [Concepción,

Curicó, & Tarapacá]

- Phyla nodiflora var. rosea (D. Don) Moldenke [Curicó]
Verbena Berterii (Meisn.) Schau. [Antofagasta, Curicó, Maule,
 & Nuble]
Verbena Berterii f. albiflora Moldenke [Valparaiso]*
Verbena brasiliensis Vell. [Colchagua & Curicó]
Verbena brasiliensis var. subglabrata Moldenke [Colchagua]*
Verbena clavata Ruiz & Pav. [Antofagasta]
Verbena crithmifolia Gill. & Hook. [Ovalle]
Verbena Cumingii Moldenke [Coquimbo]
Verbena foetida R. A. Phil. [Coquimbo & Curicó]
Verbena litoralis H.B.K. [Colchagua]
Verbena nullohella Sweet [Antofagasta]
Verbena sulphurea var. fusco rubra Skottsberg [Ovalle]
Verbena sulphurea var. taltalensis Moldenke [Antofagasta]*
Verbena trifida var. deserticola Moldenke [Antofagasta]*

ARGENTINA:

- Aloysia Schulziana Moldenke -- delete the asterisk
Junellia alatocarpa (Troncoso) Moldenke [Chubut]*
Junellia chubutensis Moldenke -- to be deleted
Junellia tetragonocalyx (Troncoso) Moldenke [Chubut]*
Junellia thymifolia (Lag.) Moldenke -- delete the asterisk
Lantana tiliaefolia Cham. [Corrientes]
Lippia asperima Cham. [Entre Ríos]
Lippia asperima var. rotundata Moldenke [Misiones]
Lippia contermina Briq. [Chaco]
Verbena Cabreræ Moldenke [Chaco]
Verbena calliantha Briq. [Formosa]
Verbena crithmifolia var. latiloba Speg. -- to be deleted
Verbena crithmifolia var. minor Gill. & Hook. -- to be deleted
Verbena glutinosa Kuntze [Río Negro]
Verbena Hunzikeri Moldenke [Catamarca & Salta]
Verbena laciniata (L.) Briq. [Catamarca & Tucumán]
Verbena Lilloana Moldenke [Tucumán]*
Verbena mendocina R. A. Phil. -- delete the asterisk
Verbena microphylla H.B.K. [Mendoza]
Verbena moricolor Moldenke [Salta]
Verbena nana Moldenke [Chaco] -- delete the asterisk
Verbena platensis var. stenodes Briq. [Córdoba]
Verbena radicans Gill. & Hook. [Tucumán]
Verbena rigida Spreng. [Buenos Aires & Formosa]
Verbena tenuisecta Briq. [Formosa]
Verbena tenuisecta var. alba Moldenke [Chaco]
Verbena tomophylla Briq. [Formosa & Misiones]

CANARY ISLANDS:

- Lantana Canara var. aculeata (L.) Moldenke [Tenerife]

ENGLAND:

- Phyla nodiflora (L.) Greene

Verbena bonariensis L.
Verbena bracteata Lag. & Rodr.
Verbena hastata L.
Verbena hispida Ruiz & Pav.
Verbena platensis Spreng.
Verbena rigida Spreng.
Verbena subina L.
Verbena tenera Spreng.

BORNHOLM ISLAND:

Verbena officinalis L.

SPAIN:

Verbena bonariensis L.

FRENCH WEST AFRICA:

Lippia multiflora Moldenke

Lippia rugosa A. Chev. -- to be deleted

ANGLO-EGYPTIAN SUDAN:

Lantana Mearnsii Moldenke [Mongalla]

Lantana viburnoides (Forsk.) Vahl [Bahr-el-Ghasal, Mongalla,
 & Red Sea]

Lantana viburnoides var. velutina Moldenke [Red Sea]

ERITREA:

Svensonia laeta (Fenzl) Moldenke

SENEGAL:

Eriocaulon Afzelianum Wikstr.

Eriocaulon Meikleii Moldenke*

Eriocaulon Monodii Moldenke*

GAMBIA:

Lippia Chevalierii Moldenke

SIERRA LEONE:

Lippia multiflora Moldenke

Lippia rugosa A. Chev. -- to be deleted

IVORY COAST:

Mesanthemum Prescottianum (Bong.) Körn.

GOLD COAST:

Lantana viburnoides var. velutina Moldenke

Lippia multiflora Moldenke

Lippia rugosa A. Chev. -- to be deleted

TOGOLAND:

Lippia multiflora Moldenke

Lippia rugosa A. Chev. -- to be deleted

NORTHERN NIGERIA:

Clerodendrum discolor var. kilimandscharense Thomas

Lantana glandulosissima Hayek

Lantana Mearnsii var. latibracteolata Moldenke

Lippia africana var. sessilis Moldenke*

Lippia multiflora Moldenke

Lippia multiflora var. pubescens Moldenke*

Lippia nigeriensis Moldenke

Lippia nigeriensis var. brevipedunculata Moldenke*

Lippia rugosa A. Chev.

SOUTHERN NIGERIA:

Lantana viburnoides var. Schimperi MoldenkeLippia multiflora MoldenkeLippia rugosa A. Chev. -- to be deleted

CAMEROONS:

Clerodendrum yaundense Gürke -- to be deletedLippia multiflora MoldenkeLippia rugosa A. Chev. -- to be deleted

FRENCH EQUATORIAL AFRICA:

Clerodendrum angolense Gürke [Middle Congo]Clerodendrum botryodes J. G. Baker [Middle Congo]Clerodendrum splendens G. Don [Middle Congo]Clerodendrum umbellatum Poir. [Middle Congo]Clerodendrum volubile P. Beauv. [Middle Congo]Lantana Mearnsii Moldenke [Ubangi-chari]Lantana Mearnsii var. congolensis Moldenke [Ubangi-chari]Lippia multiflora Moldenke [Middle Congo & Ubangi-chari]Lippia rugosa A. Chev. -- to be deletedVitex ciliata Pierre [Gabun]

BELGIAN CONGO:

Lippia Burtonii J. G. Baker -- delete the asteriskLippia multiflora MoldenkeLippia rugosa A. Chev. -- to be deletedPremna Morteihani De Wild. -- this is the correct spelling of
this binomialVitex Kruckei Pieper -- to be deletedVitex lolandjensis var. Kruckei Pieper

UGANDA PROTECTORATE:

Lantana Mearnsii var. congolensis MoldenkeLippia grandifolia var. longipedunculata Moldenke*

TANGANYIKA TERRITORY:

Lantana rugosa var. tomentosa MoldenkeLippia africana MoldenkeLippia africana var. villosa Moldenke

PANZA ISLAND:

Lantana viburnoides (Forsk.) Vahl

PEMBA ISLAND:

Lippia javanica (Burm. f.) Spreng.

ZANZIBAR PROTECTORATE:

Lantana viburnoides (Forsk.) Vahl

MOLBASA ISLAND:

Premna chrysochlada (Bojer) Gürke

KENYA:

Eriocaulon Volkensii Engl.Lantana Petitiana A. Rich.Lantana viburnoides var. velutina Moldenke

ANGOLA:

Lippia adoensis var. multicaulis Hiern -- to be deleted

Lippia strobiliformis Moldenke [Loanda]

Mesanthemum radicans Körn. [Kongo]

NORTHERN RHODESIA:

Clerodendrum capitatum var. rhodesiense Moldenke*

Clerodendrum fomicarum Gürke

Clerodendrum Milne-Redheadi Moldenke*

Clerodendrum pusillum Gürke

Clerodendrum violaceum Gürke

Lantana Hearnii Moldenke

Lantana Hearnii var. congolensis Moldenke

Lantana Milne-Redheadi Moldenke*

Lantana rhodesiensis Moldenke*

Lantana viburnoides var. velutina Moldenke

Lippia africana Moldenke

Lippia Burtonii J. G. Baker

Lippia javanica (Burm. f.) Spreng.

SOUTHERN RHODESIA:

Lantana rugosa var. tomentosa Moldenke

Lantana Swynnertonii Moldenke*

Lippia africana Moldenke

Vitex mombassae Vatke

BRITISH NYASALAND PROTECTORATE:

Lantana viburnoides var. Schimperi Moldenke

Lantana viburnoides var. velutina Moldenke

PORTUGUESE EAST AFRICA:

Clerodendrum glabrum E. Mey. [Lourenço Marques]

Mesanthemum africanum Moldenke [Mozambique]

SOUTHWEST AFRICA:

Lippia Wilmsii H. H. W. Pearson

UNION OF SOUTH AFRICA:

Clerodendrum serratum (L.) Moon [Cape of Good Hope]

Lippia Wilmsii H. H. W. Pearson -- delete the asterisk

COMORO ISLANDS:

Avicennia marina (Forsk.) Vierh. [Mayotte]

Lantana trifolia L. [Mayotte]

Premna corymbosa (Burm. f.) Rottl. & Willd. [Mayotte & Moheli]

SEYCHELLES ISLANDS:

Avicennia marina (Forsk.) Vierh. [Mahé]

CalliCARPA erioclona Schau. [Praslin]

Lantana Camara var. aculeata (L.) Moldenke [Mahé]

Lantana trifolia L. [Mahé]

Phyla nodiflora (L.) Greene [Mahé]

Premna corymbosa (Burm. f.) Rottl. & Willd. [Mahé]

Stachytarpheta adulterina Urb. & Ekm. [Mahé]

Stachytarpheta urticaefolia (Salisb.) Sims [Mahé]

NOSY-BE:

Avicennia marina (Forsk.) Vierh.

Premna corymbosa (Burm. f.) Rottl. & Willd.

MADAGASCAR:

- Callicarpa longifolia Lam.
Callicarpa macrophylla Vahl
Chascanum Humberti Moldenke*
Chascanum insulare var. canescens Moldenke*
Chascanum insulare var. Humberti Moldenke*
Chascanum insulare var. triangulare Moldenke*
Coelocarpum glandulosum Moldenke*
Coelocarpum Humberti Moldenke*
Coelocarpum Swinglei Moldenke*
Duranta repens L.
Lantana trifolia L.
Premna madagascariensis Moldenke*
Premna Perrieri Moldenke*
Priva cordifolia var. abyssinica (Jaub. & Spach) Moldenke
Priva Meyer var. madagascariensis Moldenke*
Stachytarpheta australis var. neocaledonica Moldenke
Tectona grandis L. f.
Verbena brasiliensis Vell.
xVerbena hybrida Voss

MASCARENE ISLANDS:

- Clerodendrum emirnense Bojer [Mauritius]
Clerodendrum fragrans (Vent.) R. Br. [Mauritius]
Clerodendrum fragrans var. pleniflorum Schau. [Mauritius]

REUNION:

- Callicarpa candicans (Burm. f.) Hochr.
Lantana Camara var. aculeata (L.) Moldenke
Phyla nodiflora (L.) Greene
Premna corymbosa (Burm. f.) Rottl. & Willd.
Stachytarpheta australis var. neocaledonica Moldenke

SYRIA:

- Vitex Agnus-castus f. alba (West.) Rehd.

PAKISTAN:

- Eriocaulon mitophyllum Hook. f. [East Bengal]
Eriocaulon quinquangulare L. [Northwestern Provinces]
Sphenodesme involucrata (Presl) B. L. Robinson [East Bengal]

INDIA:

- Eriocaulon achiton Körn. [Madras]
Eriocaulon cinereum R. Br. [Chota Nagpur]
Eriocaulon Edwardsii Fyson [Orissa]
Eriocaulon humile Moldenke [Bombay]*
Eriocaulon indicum Moldenke [Bombay]*
Eriocaulon lanceolatum var. pilosum Moldenke [Bombay]*
Eriocaulon luzulaefolium Mart. [Orissa]
Eriocaulon mitophyllum Hook. f. -- delete the asterisk
Eriocaulon polycephalum Hook. f. [Madras]
Eriocaulon quinquangulare L. [Chota Nagpur]
Eriocaulon Ritchieanum Ruhl. [Madras]
Eriocaulon robusto-Brownianum Ruhl. -- delete the asterisk

- Eriocaulon Santapaui Moldenke [Bombay]*
Eriocaulon Sollyanum Royle [Assam]
Eriocaulon truncatum Hamilt. [Madras]
Eriocaulon xeranthemum Mart. [Madras]
Pygmaeopremna herbacea (Roxb.) Moldenke [West Bengal]
Sphonodesme barbata (Wall.) Schau. [West Bengal]
Vitex Agnus-castus var. pseudo-negundo (Hausskn.) Bormm.
 [Bombay]
~~x~~Vitex hybrida Moldenke -- to be deleted

BURMA:

- Clerodendrum urticifolium (Roxb.) Wall. [Southern Shan States]
Eriocaulon robusto-Bromniamm Ruhl. [Tenasserim]

TIBET:

- Verbena officinalis L.

CHINA:

- Caryopteris incana f. candida (Schneid.) Hara [Kwangtung]
Caryopteris incana var. candida Schneid. -- to be deleted
Clerodendrum Lindleyi Decaisne [Kwangsi & Kwangtung]
Eriocaulon cinereum R. Br. [Shantung]

HONAN ISLAND:

- Eriocaulon cinereum R. Br.

KOREA:

- Callicarpa japonica var. Taquetii (Léveillé) Nakai*
Callicarpa Taquetii Léveillé -- to be deleted

JAPAN:

- Callicarpa caudatifolia Koidz. -- to be deleted
Callicarpa japonica f. albibacca Hara*
Callicarpa japonica f. albifructa Hara*
Callicarpa japonica var. leucocarpa Sieb. -- to be deleted
Callicarpa japonica var. microcarpa Nakai*
Callicarpa japonica var. microphylla Sieb. & Zucc.*
Callicarpa japonica var. ramosissima Nakai*
Callicarpa Kochiana Mak. -- to be deleted
Caryopteris incana f. candida (Schneid.) Hara
Clerodendrum trichotomum var. esculentum Mak.*
Eriocaulon piliphorum Satake -- this is the correct spelling
 of this binomial
Premna luxurians Nakai -- to be deleted
Premna microphylla var. luxurians (Nakai) Moldenke*
Vitex trifolia var. heterophylla (Mak.) Moldenke*

FRENCH INDO-CHINA:

- Clerodendrum palmatilobatum Dop -- this is the correct spelling
 of this binomial
Clerodendrum Petasites (Lour.) S. Moore [Cochinchina]
Clerodendrum Pierreanum Dop [Tonkin]
Congea tomentosa Roxb. [Cochinchina]
Premna cambodiana Dop [Cochinchina]
Premna cordifolia var. obtusifolia (R. Br.) Fletcher -- to
 be deleted

Premna corymbosa var. obtusifolia (R. Br.) Fletcher [Cochinchina]

Premna dubia Craib [Cochinchina]

FEDERATED MALAY STATES:

Callicarpa angustifolia King & Gamble [Selangor]

Clerodendrum inerme (L.) Gaertn. [Perak]

STRAITS SETTLEMENTS:

Clerodendrum breviflorum Ridl. [Malacca]

Clerodendrum brevifolium Ridl. -- to be deleted

Clerodendrum indicum (L.) Kuntze [Singapore]

Clerodendrum Kaempferi (Jacq.) Sieb. [Singapore]

BONIN ISLANDS:

Callicarpa boninensis Hayata -- to be deleted

MARIANNA ISLANDS:

Callicarpa candicans (Burm. f.) Hochr. -- delete "Saipan"

Callicarpa erioclona Schau. [Guam & Saipan]

Callicarpa paucinervia Merr. -- to be deleted

Phyla nodiflora (L.) Greene [Guam]

MARSHALL ISLANDS:

Clerodendrum inerme (L.) Gaertn. [Rongelap]

CAROLINE ISLANDS:

Callicarpa candicans (Burm. f.) Hochr. -- delete "Pelew Islands"

Callicarpa erioclona Schau. [Corol, Korrör, Kusaie, & Yap]

JAVA:

Clerodendrum Kaempferi (Jacq.) Sieb.

NEW GUINEA:

Eriocaulon brevipedunculatum Merr. [Papua]

Eriocaulon longifolium Nees [Papua]

FIJI ISLANDS:

Clerodendrum nutans Wall. [Viti Levu]

Stachytarheta mutabilis (Jacq.) Vahl [Viti Levu]

SAMOAN ISLANDS:

Clerodendrum nutans Wall.

SOCIETY ISLANDS:

Clerodendrum speciosissimum Van Geert [Tahiti]

CULTIVATED:

Aegiphila Hassleri Briq. [Uruguay]

Aloysia lycioides Cham. [Brazil & Cuba]

Aloysia lycioides var. paraguariensis (Briq.) Moldenke [Argentina]

Aloysia macrostachya (Torr.) Moldenke [Cuba]

Aloysia virgata var. elliptica (Briq.) Moldenke [Brazil]

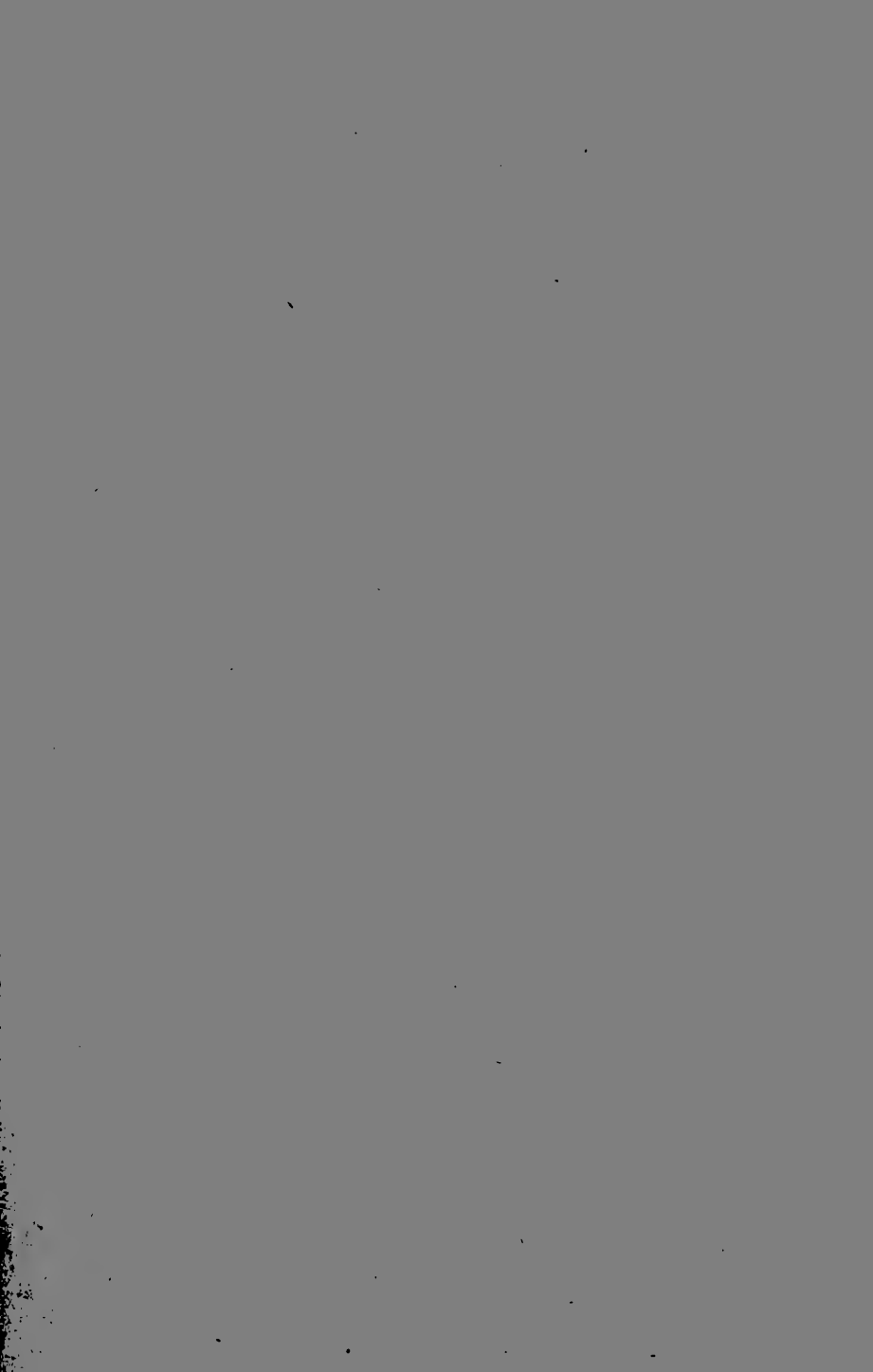
Callicarpa candicans (Burm. f.) Hochr. [Réunion]

Callicarpa japonica f. albibacca Hara

Callicarpa japonica var. leucocarpa Sieb. -- to be deleted

Caryopteris incana f. candida (Schneid.) Hara [Illinois & New Jersey]

Caryopteris incana var. candida Schneid -- to be deleted



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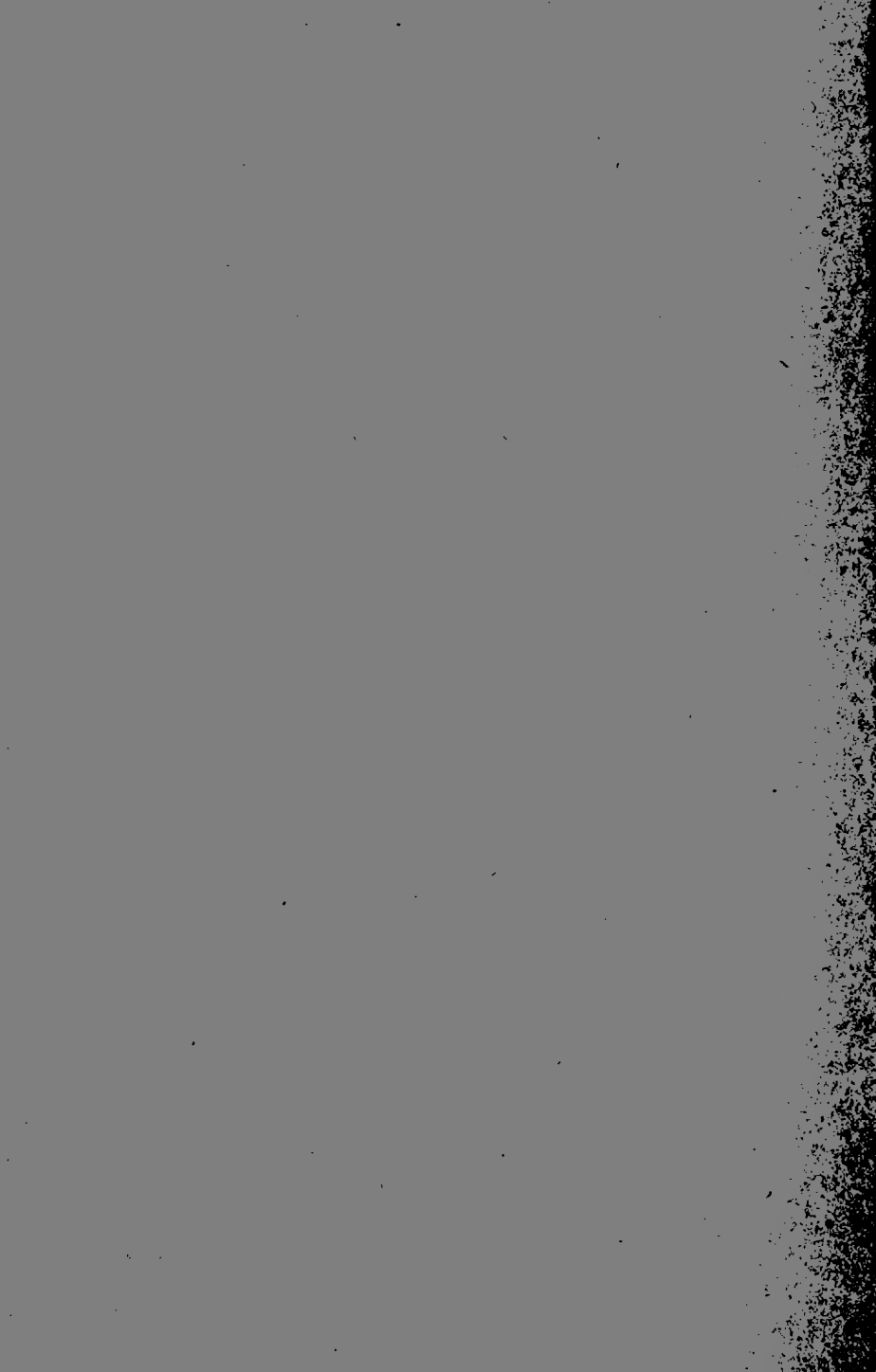
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NON-MOISTUREPROOF CELLOPHANE AND CELLULOSE ACETATE
FILM FOR PRESERVING HERBARIUM SPECIMENS

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U. S. Plant Industry Station
Beltsville, Maryland

In connection with research on induced mutations it was necessary to preserve herbarium specimens of controls and induced mutations, particularly of the delicate floral parts of various plant species, so that general comparisons and approximate length and width measurements could be made at later convenient times. This problem was solved by the use of a simple method involving the mounting of the parts between non-moistureproof cellophane (Du Pont 300 PT) or cellulose acetate (Du Pont 100 CA) film, and rapid drying for a short time.

In the preservation of floral parts, for instance, the flower is split longitudinally (cut in longisection), and the parts are placed side by side between two sheets of the film; or petals, stamens, and other parts are excised and mounted in the same way. The preparation is then placed in an ordinary plant press, between blotters and corrugated aluminum dividers, for drying in a forced draft drying oven at 60° to 65° C. for a few hours. The press is placed in the oven with the corrugations of the dividers parallel with the direction of the air current. This rapid drying prevents cloudiness in the preparation and is usually sufficient to dry the delicate parts.

Further drying of the preparation, if required, may be carried out in the usual manner, or the press may be placed in a drying box with electric light bulbs as a heat source (New York Biological Supply Co. unit) in order to obviate brittleness in the dried larger plant parts (Archer, 1945). Before being placed in the press, larger, fleshy plant parts should be heat-killed by placing them in the forced-draft oven for a minimum period, and after being placed between the sheets of film in the press, they should be left in the oven until any exuded moisture, which may be considerable, has evaporated. If necessary, after the plant parts are dry, the edges of the two sheets of film may be heat-fused in a few places to prevent separation. Finally, one end of the preparation is stapled to the left or right side or top of the herbarium sheet so that the under side may be viewed by turning over the preparation like a leaf in a book.

Preparations made by this method are subject to minimum shrinkage and as a rule the color of the plant parts is nearer the original than when the preparations are made by the conventional method.

The method, briefly outlined, has general application in herbarium technic. Floral parts from dried specimens restored by soaking (maceration) may also be permanently mounted between sheets of film, dried, and stapled to the herbarium sheet, as indicated, for convenient inspection.

No attempt has been made in this brief note to touch on the various factors that must be considered in adapting this technic to general herbarium practice, and this is left to those interested. Apparently its main value will be in preserving the delicate floral parts and in mounting leaves or parts of leaves so that the upper and under sides may be easily viewed in the same specimens. Whether the non-moisture-proof cellophane or the cellulose acetate film will prove more lasting still has to be determined. The former gives somewhat quicker drying than the latter which is important when working with larger fleshy parts. Nylon and other newer plastic films will also be tested for the purpose indicated. In this connection it is of interest to note that according to Minoque (1943), "Cellulose acetate, cellulose acetate-propionate, cellulose acetate-butyrate, and nylon films are all suitable" for use in the repair and preservation of records, and "materials similar in appearance but different in composition, such as cellophane, cellulose nitrate, ethyl cellulose, and the vinylite resins, should not be used in records treatment as they are either not sufficiently plastic or not permanent."

LITERATURE CITED

- Archer, W. Andrew. Collecting Data and Specimens for Study of Economic Plants. U. S. Dept. Agric. Misc. Publ. 568. 1945.
- Minoque, Adelaide E. The Repair and Preservation of Records. U. S. Nat. Arch. Bull. 5. 1943.

JUNIPERUS UTAHENSIS Lemm.

P. J. van Melle

Juniperus utahensis (J. californica var. utahensis Engelm.)
Lemmon, in Dienn. Rept. Cal. St. Bd. Forestry 3, 133, t. 28,
f. 2 (1890).

It seems to have gone unnoticed in the literature of American junipers that this publication, as to description and illustration, represents substantially J. occidentalis Hook. rather than Engelmann's var. utahensis. Apart from the distribution data the only descriptive element in it not applicable to J. occidentalis is the statement: "berries .. reddish". The illustration depicts J. occidentalis -- not as commonly described, but, particularly, maturely adult pistillate material of it (from Sierra Co., Calif.), such as, at least in that part of the Sierras, occurs freely with the monoecious and staminate phases. It differs from them conspicuously by the greater length and filiform aspect of the ultimate branchlets -- a phenomenon which I do not find recorded in literature. In the summer of 1949 I collected the three phases near Cisco, Nevada Co., Calif. -- a little to the south of Lemmon's locality. The long branchlets, in some instances to 4 cm. long, were found in all maturely adult pistillate individuals observed by me; in them only; not in pistillate parts of monoecious individuals. Here is the clearest case known to me within the genus Juniperus of a morphological difference in vegetative parts between the pistillate and other sex phases of a species.

Lemmon's erroneous record has given rise to subsequent more or less faulty accounts of J. utahensis. Probably traceable, directly or indirectly, to his illustration is the statement: "branchlets slender", attributed to it by Sargent (Silva of N. Am. 10, 81) and Rehder (Man. Cult. Trees & Shrubs, both editions). It does not fit J. utahensis. On the other hand, both these authors apply to J. occidentalis the attribute: "branchlets stout" -- which is near enough for its staminate and monoecious phases, but not for the pistillate.

If it were not for Lemmon's citation of Engelmann's var. utahensis, his publication of J. utahensis would be rejectable as a nomen superfluum for J. occidentalis Hook. Engelmann, in Trans. Ac. Sci. St. Louis 3, pt. 4, 538 (1877), did not designate a type specimen for his variety. I assume that authentic Engelmann material exists to validate his variety, and, therefore, the name J. utahensis of Lemmon, based upon it.

Though no argument is made here to invalidate Lemmon's J. utahensis, it would seem, nevertheless, that his publication can hardly be cited in critical studies with propriety without considerable qualification or emendation.

ON SOME ASIATIC POLYGONUMS

J. F. Brenckle

Agreement seems difficult in the naming of some Himalayan polygonums. Descriptions in Meisner and in Stewart (1, 2) often lack definition. The following selected specimens, with certain unique characters, seem to form a well-defined phylad limited to central Asia. The emended descriptions may help to define the species.

Polygonum paronychioides C. A. Mey.

Perennial with fruticose stems and branches. The fruiting twigs are composed of short (3--5 mm.) woody sections each of which has one perianth with an achene, which are persistent after leaf and ocrea have fallen. The achenes are lenticular or imperfectly triangular, one face being more or less umbonate, smooth, brown to black, 2.5--3 mm. long.

A typical specimen is R. R. Stewart 9966 in the New York Botanical Garden herbarium. Additional specimens examined are Walter Koelz 2961 in the New York Botanical Garden herbarium, as well as R. R. Stewart 20130 and Walter Koelz 2961 in the United States National Herbarium at Washington.

Polygonum mucronatum Royle

The name P. mucronatum has been placed in synonymy under the preceding species (2), but, while showing relationship, there are distinctive characters which make it a good species.

Perennial with fruticose stems and branches. The leaves are mucronate. The fruiting organ is a strobile-like spikelet at the end of a slender herbaceous twig. The spikelet is composed of short stem sections each of which carries a narrow bract, a white or lavender ocrea which dominates and encircles the stem, and a perianth, 5-parted to half or more its length, with an achene. The leaf, ocrea, and perianth are flattened and imbricated. The spikelet as a whole and the stem sections are readily deciduous. The achene is lenticular or vaguely triangular with only the tip actually triangular. The tip is

bent and sharp-edged or wing-margined, brown, shining, narrow, 2 mm. long.

A typical specimen is R. R. Stewart 9997 in the New York Botanical Garden herbarium. Additional specimens examined are R. R. Stewart 18976 and Walter Koelz A.135, 2735, 2947, 5766, 5879, 6160, and 7194, all in the New York Botanical Garden herbarium, and Walter Koelz 2947, 5766, 5879, 6117, 6160, 7038, 7194, and 7214 in the United States National Herbarium.

Polygonum pulvinatum Komarov

Cushion knotweed. The following translation was taken from the Flora of the Soviet Union, volume 5 [Addenda 4], page 717 (1936). The editor, V. L. Komarov, is a member of the Botanical Institute of the Academy of Sciences, U. S. S. R. The translation was kindly made for me by L. H. Shinnars at the University of Wisconsin, Madison, Wisconsin.

"From the crown of the root downward comes a bunch of dense dark stout rootlets and above somewhat strictly a bunch of close semi-underground stems, about 5 cm. long, toward the summit with short leafy branchlets forming dense cushions, 5--10 cm. in diameter; stipules silvery white, semi-transparent, forming a sort of rosette at the branch tips, stipules on the nodes of the stems also lanceolate, symmetrically divided, soon torn into irregular tangled segments; leaves linear, narrow, with margins inrolled beneath, and acute but not mucronate, naked, not roughened, as also the branches; flowers solitary, shorter than the stipules, greenish or red, on very short pedicels, their segments separated nearly to the base, rounded at the tips; stamens 3; fruit trigonous, glabrous, the angles almost winged. May--July.

"Artemisia-steppes on flat slopes of valleys, and Artemisia steppes on sand. Central Asia; Aral-Casp. (also Kyz-Kum. and preBalkan), W. Siberia, upper Tob., Irt. Endemic. Described from a specimen from the lower course of the Sary-sa River. Type in Leningrad" (3).

Specimens examined are Walter Koelz A.135, 5766, and 9642, and R. R. Stewart 18976, 21234, and 1912-13, all in the New York Botanical Garden herbarium, and Schlagintweit 803981 [Tibet], R. R. Stewart 20505A, and Walter Koelz 5766, 6160, and 7214 in the United States National Herbarium.

Polygonum molliaeforme Boiss.

Several slender mountain forms are confused under this name. The description given by Stewart (2) ends with the words "...achenes triangular, smooth and shining", but an isotype [Kotschy 778 from Persia, collected in August 1842] in the New York Botanical Garden herbarium shows them to be quite

different. The specimen is not quite mature. It has fruiting spikelets at the ends of the twigs; achenes lenticular lanceolate, more or less wing-margined, concave on the upper side, the tip bent upwards, brown, 1.5--1.8 mm. long. These plants, with the foregoing species, contain a new concept of inflorescence in *Polygonum*.

A dwarf alpine annual growing scattered or in small mats; stems slender, capillary, brown or reddish, smooth, simple or branched, angled at the nodes, mostly 2--5 cm. high; leaves linear, sessile, apiculate or aristate, 4--8 mm. long; ocreae white or lavender, split into 2 or 3 ovate or lanceolate parts, dentate at the end with short teeth, 4--5 mm. high or higher, persistent. The inflorescence is at the ends of branches and spurs, in ovate strobile-like tufts, about 10 mm. long; the rachis is made up of about 8--12 short stem sections 2--3 mm. long, each of which is occupied by a linear, green, aristate bract, 4--5 mm. long, and a white or lavender, dentate, persistent ocreolus which is about 4 mm. high, envelopes the perianth, and is split into 2 or 3 ovate parts; the whole is compressed into a flattened concave scale; scales imbricated; the tuft as a whole is deciduous and the sections of the rachis easily separating; the perianth is flattened, 5-parted $1/2$ to $2/3$ its height, the sections rounded, white or lavender-margined, with a green triangular spot at the base, 2 mm. high; the mature achene is lenticular, ovate, rounded at the base; tapering to the apex, the upper $1/4$ is bent upward with its edges wing-margined, the body being simply edged or slightly margined, brown, smooth, shining, 1.5--2 mm. long, about 1 mm. wide.

A typical specimen is U. S. Nat. Herb. 165925, collected by Walter Koelz (his no. 2658) on August 18, 1931, in dry ground, altitude 14,000 feet, at Chartren Chen (Tog Nulla), Ladak, Kashmir, and is selected because of its mature achenes. Additional specimens examined are U. S. Nat. Herb. 1605906, 1605919, 1609320, 1609574, and 1605794 [of the last-mentioned sheet some plants are infested by the smut *Ustilago utriculata* (Nees) Tul.], all deposited at Washington; Walter Koelz 2653, 2831, 2837, 6547, and 7037, R. R. Stewart 460a, and H. de Ferra & Hutchinson 178, all in the New York Botanical Garden herbarium; and K. H. & F. Rechinger 5408, collected in the province of Shahrud-Bustam, Iran, in 1948, deposited in my own herbarium.

To the above, the following new variety and form are hereby proposed:

Polygonum molliaeforme f. *attenuatum* Brenckle, f. nov.

Haec forma a forma typica speciei recedit sectionibus caulibus elongatis usque ad 10 cm. longis et ocreis ocreolisque elongatis, dentibus brevibus usque ad longe attenuatis lineari-

bus.

Stems with elongated sections up to 10 cm. high, the ocreae and ocreolae elongated, with teeth from short to long-tapering and linear.

The type specimen is U. S. Nat. Herb. 1603806, collected by Walter Koelz (his no. 5640) on July 16, 1933, altitude 13,000 feet, near Tetha Zaskar, Kashmir, deposited at Washington.

Polygonum molliaeforme var. pygmaeum Brenckle, var. nov.

Haec varietas a forma typica speciei recedit caulibus simplicibus capillaribus 5--10 mm. altis; foliis bracteisque linearibus aristatis; apicibus ocrearum aristatis; spiculis plerumque solitariis, rare per caulem 2 vel 3; floribus lavandulaceis; fructibus lenticularibus ovatis obesusculis, apice paullo curvato laevi brunneo ca. 1 mm. longo.

Stem simple, capillary, 5--10 mm. high; leaves and bracts linear, aristate; ocreae with aristate tips; spikelets usually one, seldom 2 or 3 to a stem; flowers lavender; achenes lenticular, ovate, rather plump, the tip slightly bent, smooth, brown, about 1 mm. long.

The type specimen was collected by Walter Koelz (no. 2395) on July 20, 1931, on a dry sandy plain, at an altitude of 15,000 feet, Tsakzhun Tso, Ladak, Kashmir, and is deposited in the Britton Herbarium at the New York Botanical Garden.

- (1) C. F. Meisner in De Candolle, Prodrumus XIV. 1857.
- (2) A. N. Stewart, Contributions from the Gray Herbarium LXXXVIII. 1930.
- (3) V. L. Komarov, Flora U. R. S. S. V, Addenda IV, pp. 596 et seq. 1936.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND
ERIOCAULACEAE. SUPPLEMENT 3

Harold N. Moldenke

Since sending copy for the second supplement to my enumeration of the known geographic distribution of the 4402 accepted members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae of the world to the editor of the "Revista Sudamericana de Botanica" for publication in that periodical almost one thousand additional specimens of these groups have passed through my hands. These have brought to light 2 new county records, 63 new state, province, or department records, and 32 country or island records, as well as a number of corrections and emendations to my original list. The specimens on which these records are based are deposited in the Britton Herbarium at the New York Botanical Garden, the United States National Herbarium at Washington, and the herbaria of Cornell University at Ithaca, the Royal Botanic Gardens at Kew, the Museo Nacional de Historia Natural at Santiago de Chile, the Naturhistoriska Riksmuseum at Stockholm, the Botaniska Trädgård at Göteborg, and the Muséum National d'Histoire Naturelle at Paris. As in the previous supplements and in the original list, an asterisk indicates that the species or variety is endemic to that country or island, as far as now known.

UNITED STATES OF AMERICA:

Missouri:

Callicarpa americana L. [Ozard County]

Texas:

Verbena ciliata var. pubera (Greene) Perry [Culberson County]

GUATEMALA:

Phyla betulaeifolia (H.B.K.) Greene [Escuintla]

COLOMBIA:

Lantana maxima Hayek [Huila]

VENEZUELA:

Lantana achyranthifolia Desf. [Mérida]

Stachytarpheta mutabilis (Jacq.) Vahl [Trujillo]

BRITISH GUIANA:

Lantana canescens H.B.K.

PERU:

Lippia aprica R. A. Phil. is to be deleted

Lippia turbinata Griseb. [Tacna]

BRAZIL:

Lantana radula subsp. glabrescens Hayek [São Paulo]*

Leiothrix Michaelii var. longipilosa Moldenke [Minas Geraes]*

Lippia Riedeliana Schau. [São Paulo]

Lippia sidoides f. flaccida Hayek [São Paulo]*

Lippia subracemosa Mansf. [Minas Geraes]

Lippia velutina Schau. [Minas Geraes]

Paepalanthus acanthophyllus Ruhl. [Minas Geraes]

Paepalanthus paucifolius Alv. Silv. is to be deleted

Paepalanthus perpusillus Kunth [Minas Geraes]

Stachytarpheta polyura Schau. [Rio Grande do Sul]

Stachytarpheta procumbens Moldenke [Minas Geraes]*

Syngonanthus densiflorus (Körn.) Ruhl. [Minas Geraes]

Syngonanthus goyazensis (Körn.) Ruhl. [Minas Geraes]

Syngonanthus helminthorrhizus (Mart.) Ruhl. [Mattogrosso],
delete Rio Grande do Sul

Syngonanthus Mendesii Moldenke [Minas Geraes]*

Verbena inamoena Briq. [Rio Grande do Sul]

Verbena peruviana (L.) Britton [Rio Grande do Sul]

BOLIVIA:

Citharexylum andinum Moldenke [Cochabamba]

Citharexylum mendocinum R. A. Phil. is to be deleted

URUGUAY:

Eriocaulon modestum Kunth

Eriocaulon Moldenkei Herter is to be deleted

CHILE:

Junellia lavandulaefolia (R. A. Phil.) Moldenke [Colchagua]

Lippia aprica R. A. Phil. is to be deleted

Lippia turbinata Griseb. [Tácnica]

Verbena longavina R. A. Phil. is the correct orthography of
this binomial [Linares]

ARGENTINA:

Aloysia Castellanosii Moldenke [Jujuy]

Aloysia lycioides var. paraguariensis (Briq.) Moldenke
[Corrientes]

Junellia connatibracteata (Kuntze) Moldenke [Neuquen]

Junellia scabrido-glandulosa (Turrill) Moldenke [Neuquen]*

Junellia tridactylites (Lag.) Moldenke [Neuquen]

Lantana tiliaefolia f. albiflora Moldenke [Misiones]

Lantana trifolia f. hirsuta Moldenke [Jujuy]

Verbena aurantiaca Speg. [Neuquen]

Verbena bonariensis var. conglomerata Briq. [Corrientes]

Verbena brasiliensis Vell. [Jujuy]

Verbena Cabrerae Moldenke [Buenos Aires]

Verbena glandulifera Moldenke [Santiago del Estero]

Verbena Hunzikeri Moldenke [Jujuy]

Verbena intermedia Cill. & Hook. [San Luis]

- Verbena Isabellei Briq. [Corrientes]
Verbena peruviana (L.) Britton [San Luis]
Verbena spectabilis Moldenke [Chaco]
Verbena tenera var. albiflora Kuntze [Buenos Aires]

UNION OF SOUTH AFRICA:

Lantana Mearnsii Moldenke

SEYCHELLES ISLANDS:

Stachytarpheta mutabilis (Jacq.) Vahl

MADAGASCAR:

Stachytarpheta jamaicensis f. monstrosa (Moldenke) Moldenke

Stachytarpheta mutabilis (Jacq.) Vahl

REUNION:

Stachytarpheta jamaicensis (L.) Vahl

Stachytarpheta mutabilis (Jacq.) Vahl

PAKISTAN:

Eriocaulon quinquangulare L. [East Bengal]

INDIA:

Eriocaulon gracile Mart. -- delete the "*"

Eriocaulon nepalense Prescott [Madras]

Eriocaulon odoratum Dalz. -- delete the "*"

Eriocaulon sexangulare L. [Travancore]

Eriocaulon Wallichianum var. tenellum Wight is to be deleted

MERGUI ARCHIPELAGO:

Eriocaulon sexangulare L.

Eriocaulon Wallichianum Mart. is to be deleted

CHINA:

Eriocaulon Henryanum Ruhl. -- delete the "*"

Eriocaulon sexangulare L. [Fukien, Kwangtung]

Eriocaulon Wallichianum Mart. is to be deleted

JAPAN:

Callicarpa takakumensis Hatusima [Kiusiu]*

HONGKONG:

Eriocaulon sexangulare L.

Eriocaulon Wallichianum Mart. is to be deleted

HAINAN ISLAND:

Eriocaulon pachypetalum Hayata

FRENCH INDOCHINA:

Eriocaulon bassacense Moldenke [Laos]*

Eriocaulon cinereum R. Br. [Tonkin]

Eriocaulon echinulatum Mart. [Cambodia & Laos]

Eriocaulon gracile Mart. [Cambodia]

Eriocaulon Henryanum Ruhl. [Tonkin]

Eriocaulon intermedium Körn. [Tonkin]

Eriocaulon laosense Moldenke [Laos]*

Eriocaulon Merrillii Ruhl. [Tonkin]

Eriocaulon odoratum Dalz. [Cambodia]

Eriocaulon oryzetorum Mart. [Tonkin]

Eriocaulon Poilanei Moldenke [Annam]*

Eriocaulon truncatum Hamilt. [Tonkin]

FEDERATED MALAY STATES:

Eriocaulon longifolium Nees [Pahang]

STRAITS SETTLEMENTS:

Eriocaulon longifolium Nees [Singapore]

Eriocaulon Wallichianum Mart. is to be deleted

LIUKIU ISLANDS:

Eriocaulon sezangulare L. [Iriomote]

Eriocaulon Wallichianum Mart. is to be deleted

PHILIPPINE ISLANDS:

Premna Cumingiana Schau. [Panay]

HAWAIIAN ISLANDS:

Stachytarpheta urticaefolia (Salisb.) Sims [Kauai]

CULTIVATED:

Phyla nodiflora (L.) Greene [Canada]

NOTES ON NEW AND NOTEWORTHY PLANTS. XI

Harold N. Moldenke

CLERODENDRUM HUMBERTI Moldenke, sp. nov.

Frutex, ramis ramulisque sarmentosisque numerosis gracilibus albidis subteretibus dense albido-strigosis, pilis arcte adpressis antrorsis; foliis parvissimis oppositis; petiolis filiformibus densiuscule adpresso-strigillosis; laminis orbicularibus integris, ad basin rotundatis vel truncatis, ad apicem rotundatis vel emarginatis, utrinque glabris et densissime impresso-punctatis; inflorescentiis terminalibus paucifloris.

Twiggy shrub; branches, branchlets, and twigs numerous, slender, light-gray or whitish, subterete, densely white-strigose with short closely appressed antrorse hairs; nodes not annulate; principal internodes 1.3--4 cm. long; leaves very small, decussate-opposite, regular, apparently quite uniform; petioles filiform, 2--4.9 mm. long, rather densely appressed-strigillose with whitish hairs; blades firmly chartaceous, perhaps somewhat fleshy when fresh, uniformly bright-green on both surfaces or slightly lighter beneath, orbicular, 5--10 mm. long and wide, entire, rounded or truncate at the base, rounded or emarginate at the apex, glabrous on both surfaces, very densely impressed-punctate on both surfaces; midrib and the approximately 4 secondaries filiform, very tenuous, indiscernible on both surfaces or very obscure beneath; veinlet reticulation indis-

cernible on both surfaces; inflorescence terminal and in the uppermost leaf-axils, small, cymose, the individual cymes 1.5--3 cm. long and wide, rather few-flowered; peduncles very slender, very densely white-strigose like the twigs, 6--10 mm. long; pedicels filiform, 3.5--6 mm. long, scattered-strigillose with white hairs; calyx campanulate, about 2 mm. long and wide, very sparsely scattered-strigillose with very short white hairs, its rim very shallowly and obscurely 5-toothed or subtruncate; corolla hypocrateriform, pale greenish-white, its tube about 5 mm. long, puberulent outside, its limb about 5 mm. wide; stamens and pistil long-exserted, the latter about 11 mm. long, glabrous, bifid at the apex.

The type of this species was collected by Henri Humbert and C. F. Swingle (no. 5623) in the neighborhood of Ambovombe, at an altitude of 1--50 m., in the extreme south of Madagascar, on September 9, 1928, and is deposited in the United States National Herbarium at Washington.

ERIOCAULON BASSACENSE Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis firme membranaceis erectis linearibus obtusis 6- vel 7-costatis utrinque glabris; vaginis arcte adpressis multicostatis glabris; pedunculis filiformibus 4- vel 5-costatis stramineis paullo tortis glabris; capitulis hemisphaericis griseo-albidis 5--7 mm. diametro.

Acaulescent herb; leaves cespitose, membranous but rather firm, erect, linear, 14--23 cm. long, 1.5--2 mm. wide at the mid-point, blunt at the apex, 6- or 7-ribbed, glabrous on both surfaces; sheaths rather closely appressed, 8--9 mm. long, much shorter than the leaves, many-costate, glabrous, its apex obliquely split, the limb short, blunt, erect, scarious-margined; peduncles about 5 per plant, filiform, 4- or 5-costate, stramineous, slightly twisted, glabrous; heads hemispheric, 5--7 mm. in diameter, grayish-white; involucrel bractlets tough and firm, brown or blackish, obovate, 1.5--2 mm. long, 0.9--1.5 mm. wide, rounded at the apex, glabrous; receptacle densely long-villous with white hairs; receptacular bractlets oblanceolate, at least the upper half black, surpassing the florets, about 2 mm. long and 1 mm. wide, cuspidate-acuminate, densely white-ciliolate along the margins from the widest part to the apex; staminate florets: sepals 3, separate, obovate, stramineous, about 2 mm. long and 1.5 mm. wide, rounded, densely white-bearded on the back toward the apex; petals 3, connate below into a tube about 0.5 mm. long, the free terminal portion lingulate, about 0.4 mm. long, rounded at the apex, densely short-bearded with white hairs, bearing a black gland near the apex on the front; stamens 6; anthers dark-brown or black; pistillate florets: sepals 3, separate, obovate, navicular-concave, stramineous, about 2 mm. long and 1.5 mm. wide, rounded at the apex, densely short-bearded on the back at the apex with white hairs;

petals 3, separate, elliptic, unequal, subhyaline, about 1.5 mm. long, 0.3--0.6 mm. wide, very densely long-pilose with white hairs on the back, bearing a black gland near the apex on the front.

The type of this species was collected by Eugène Poilane (no. 15668) in acid soil at an altitude of 1200 m., Plateau de Boloven, north of Paksong, province of Bassac, Laos, French Indochina, on September 21, 1928, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON LAOSENSE Moldenke, sp. nov.

Herba acaulescens minima; foliis rosulatis membranaceis linearibus erectis vel adscendentibus attenuato-acutis obscure fenestratis paucis utrinque glabris; vaginis laxiusculis glabris subfenestratis; pedunculis stramineis paullo tortis 3-costatis glabris; capitulis hemisphaericis sordido-albidis.

Tiny acaulescent herb; leaves rosulate, membranous, linear, erect or ascending, 5--7 mm. long, 1 mm. wide or less, attenuate-acute at the apex, rather obscurely fenestrate, few, glabrous on both surfaces; sheaths 10--13 mm. long, considerably surpassing the leaves, rather lax, glabrous, somewhat fenestrate, obliquely split at the apex, the limb lanceolate, erect, slightly outwardly arching; peduncles several, erect, stramineous, 1.7--3 cm. long, slightly twisted, 3-costate, glabrous; heads hemispheric, 2--3 mm. in diameter, sordid-whitish; involucre bractlets pale-stramineous, elliptic, 1.3--1.5 mm. long, about 0.3 mm. wide, subacute at the apex, glabrous, nitid; receptacle long-pilose with white erect hairs; receptacular bractlets subhyaline, linear-oblong, 0.3--0.9 mm. long, about 0.1 mm. wide, acute at the apex, glabrous; staminate florets: sepals 3, separate, hyaline, obovate, navicular-subcucullate, 0.8--0.9 mm. long, about 0.4 mm. wide, obtuse at the apex, white-pilose on the back toward the apex; petals 3, united into a white tube 0.9 mm. long, only the stamen-bearing apices free, triangular-acute, erect or spreading; stamens 6; anthers brown; pistillate florets: sepals 3, separate, hyaline, spatulate, about 0.9 mm. long and 0.2 mm. wide, cuspidate-acute at the apex, appressed-pilose on the back; petals 3, separate, hyaline, lanceolate, 1.3--1.5 mm. long, one longer than the other two, all filiform-clawed at the base, acute at the apex, glabrous; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-celled; style about 0.2 mm. long, glabrous; stigmas 3, about 0.4 mm. long.

The type of this species was collected by Eugène Poilane (no. 15468) near Saravane, Laos, French Indochina, on September 5, 1928, and is deposited in the Britton Herbarium at the New York Botanical Garden. The number of novelties and new records turned up by this one collector in French Indochina is an indication of the wealth of material still awaiting discovery there.

ERIOCAULON POILANEI Moldenke, sp. nov.

Herba acaulescens nana; foliis caespitosis graminoides membranaceis in siccitate brunnescentibus obscure fenestratis utrinque glabris; vaginis adpressis glabris; pedunculis 4-costatis paullo tortis glabris substramineis; capitulis hemisphaericis vel subglobosis substramineis ca. 4 mm. diametro.

Dwarf acaulescent herb to 5 cm. tall; leaves caespitose, grass-like, membranous, uniformly dark-green on both surfaces, somewhat brunnescent in drying, 3.5--5 cm. long, about 3 mm. wide at the mid-point, glabrous on both surfaces, obscurely fenestrate, acute at the apex; sheaths rather close, about 2 cm. long, glabrous, obliquely split at the apex, the limb lanceolate, erect, blunt; peduncles numerous, 20 or more per plant, erect, 4-costate, slightly twisted, glabrous, dull-stramineous; heads hemispheric or eventually almost subglobose, about 4 mm. in diameter, dull-stramineous; involucre bractlets pale-stramineous, oblong-elliptic, about 3.5 mm. long and 1 mm. wide, acute at the apex, glabrous; receptacle sparsely long-villous; receptacular bractlets stramineous, elliptic, about 2.9 mm. long and 0.9 mm. wide, acute at the apex, concave, glabrous on both surfaces; staminate florets: sepals 3, hyaline, connate at the base into a narrow-cylindric tube about 0.8 mm. long, the terminal free portion falcate-elliptic, about 1 mm. long, acute, glabrous; petals 3, united into a hyaline tube about 1 mm. long, glabrous; stamens 6; anthers brown; pistillate florets: sepals 3, linear, separate, hyaline, about 1.3 mm. long and 0.04 mm. wide, glabrous; petals 3, separate, linear-filiform, hyaline, about 0.7 mm. long and 0.04 mm. wide, densely long-villous with white hairs; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-celled, 3-ovulate; style about 0.4 mm. long, glabrous; stigmas 3, about 1.5 mm. long.

The type of this species was collected by Eugène Poilane (no. 5600) -- in whose honor it is named -- in grassy very sandy soil about 1 km. from the sea at Ca-Na, in the province of Phanrang, Annam, French Indochina, on March 6, 1923, and is deposited in the Britton Herbarium at the New York Botanical Garden.

JUNELLIA SCABRIDO-GLANDULOSA (Turrill) Moldenke, comb. nov.

Verbena scabrido-glandulosa Turrill in Curtis, Bot. Mag. 167: pl. 98. 1950.

LANTANA BALANSAE f. *ALBIFLORA* Osten & Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having its corollas white, sometimes yellow in the throat.

The type was collected by A. G. Schulz (no. 1462) at the edge of "monte" in fertile soil at Colonia Benítez, Chaco, Argentina, in November 1936 and is deposited in the Britton Her-

barium at the New York Botanical Garden.

LANTANA TILIAEFOLIA f. *ALBIFLORA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type was collected by G. J. Schwarz (no. 2185) at Cerro Melo, dept. San Ignacio, Misiones, Argentina, on March 7, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LEIOTHRIX MICHAELII var. *LONGIPILOSA* Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis longe patentem pilosis recedit.

This variety differs from the typical form of the species in having its peduncles densely long-pilose with hairs borne at right angles to the peduncles and grayish-flavitious in color.

The type was collected by William Andrew Archer and Mello Barreto (no. 4955) on campo at km. 141 along the road to Conceição, Serra de Cipó, Minas Geraes, Brazil, on August 6, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden.

STACHYTARPHETA PROCUMBENS Moldenke, sp. nov.

Herba procumbens; caulibus mediocriter crassiusculis obtuse tetragonis densissime albo-villosis, pilis valde patentibus; foliis uniformibus oppositis; petiolis obsolete vel usque ad 1 mm. longis longe villosis; laminis chartaceis brunnescentibus ellipticis vel subobovatis integris vel subintegris, ad apicem obtusis vel subacutis, ad basin obtusis vel rotundatis, densiuscule longiciliatis, supra parcissime longe pilosis, subtus irregulariter longe pilosis; inflorescentiis solitariis terminalibus erectis densissime multifloris; corollis coeruleis

Procumbent herb; stems 60 or more cm. long, rather slender or medium-stoutish, obtusely tetragonal, very densely whitish-villous with wide-spreading sharp-pointed hairs, not branched; nodes not visibly annulate; principal internodes very uniform, 1--2.5 cm. long; leaves numerous, regular, very uniform, decussate-opposite, often bent so as to stand erect and borne at right angles to the stem; petioles obsolete or to 1 mm. long and densely long-villous like the stems; blades chartaceous, rather uniformly green on both surfaces, brunnescent in drying, elliptic or slightly obovate, 1.5--2 cm. long, 7--12 mm. wide, obtuse or subacute at the apex, obtuse or rounded at the base, entire or subentire, rather densely long-ciliate with white hairs on the margins from base to apex, very sparsely long-pilose above with a few scattered hairs, long-pilose with hairs exactly similar to the cilia on the midrib and secondaries beneath and on the lamina near the margins; midrib very slender,

obscure above, subprominulous beneath; secondaries 3 or 4 per side, indiscernible above, very slightly subprominulous or obscure beneath; inflorescence solitary, terminal, erect or ascending, about 6 cm. long, about 1.5 cm. in diameter in anthesis, very densely many-flowered; peduncle abbreviated, about 5 mm. long, tetragonal, villous like the stems; flowers closely imbricate, appressed; bracts lanceolate, about 7 mm. long and 1.1 mm. wide at the base, attenuate-subacuminate at the apex, very sparsely and obscurely ciliolate, subglabrate on the back; calyx tubular, 8--9 mm. long, alate-angled and sparsely long-pilose on the angles, otherwise glabrous; corolla blue, its tube about 1 cm. long, its limb about 1 cm. wide.

The type of this species was collected by Geraldo Mendes Magalhães (no. 2629) on a wet campo at Serra da Ponte de Pedra, município Jaboticatubas, Minas Geraes, Brazil, on November 17, 1942, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is related to *S. prostrata* Glaz. of Goyaz, but can easily be distinguished by its entire or subentire leaves.

SYNGONANTHUS MENDESII Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis firmis rigidis utrinque flavido-viridibus graminoides glabris obtusis; vaginis arcte adpressis valde tortis costatis glabris; pedunculis filiformibus flavis valde tortis glabris; capitulis hemisphaericis radiatis pulchris, 1 cm. diametro.

Acaulescent herb; leaves caespitose, firm and stiff, the younger ones erect, the outer ones recurved or reflexed to the ground, pale yellowish-green on both surfaces, shiny, grass-like, 1--2 cm. long, 1.5--2 mm. wide at the mid-point, blunt at the apex, very prominently many-ribbed beneath, ampliate and scarious-margined at the base, glabrous on both surfaces, opaque, not fenestrate; sheaths tightly appressed, about 4 cm. long, greatly twisted, several-costate, glabrous, its apex obliquely split, the limb closely appressed, erect, acute; peduncle filiform, bright-yellow, 6 or more per plant, greatly twisted, 28--38 cm. long, glabrous; heads hemispheric, radiate and *Anthemis*-like, very showy, about 1 cm. in diameter; involucrel bractlets coriaceous and tough, in several distinct series of which the outermost are tightly appressed and very small, the middle ones larger, oblong-elliptic, 1--3 mm. long, 1--1.5 mm. wide, concave, obtuse at the apex, glabrous, the inmost petaloid, spatulate, far surpassing the disk, the basal haft linear-oblong, about 2.5 mm. long and 0.7 mm. wide, glabrous, the upper portion expanded, elliptic, white, about 3.5 mm. long and 1.5 mm. wide, blunt at the apex, glabrous; receptacle densely long-pilose with white hairs; receptacular bractlets none; staminate florets long-stipitate: sepals 3, separate, hyaline, narrowly elliptic, about 1.5 mm. long and 0.4 mm. wide,

blunt at the apex, glabrous; petals 3, hyaline, connate at the base into a slender tube about 0.5 mm. long, the free terminal portion lanceolate, erect, about 1 mm. long, glabrous; stamens 3; pistillate florets: sepals 3, linear, hyaline, about 0.8 mm. long and 0.1 mm. wide, glabrous; petals 3, hyaline, linear, about 1.9 mm. long and 0.1 mm. wide, glabrous, connate at the base and apex; ovary subglobose, about 0.6 mm. long and wide, glabrous, 3-celled; style abbreviated, about 0.2 mm. long, glabrous, its 3 appendages about 0.7 mm. long; stigmas 3, about 0.2 mm. long.

The type of this handsome species was collected in sedimentary soil on a hilltop at Serra do Cabral, municipio Euenopolis, Minas Geraes, Brazil, on August 28, 1949, by Geraldo Mendes Magalhães (no. 4339) -- in whose honor it is named -- and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM MADAGASCARIENSE Moldenke, nom. nov.

Clerodendron ternifolium J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 229. 1883 [not *Clerodendrum ternifolium* H.B.K., Nov. Gen. & Sp. Pl. 2: 244. 1817, nor *Clerodendrum ternifolia* D. Don, Prod. Fl. Nep. 103. 1825].

LEIOTHRIX MENDESII Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis graminoides adscendentibus acutis multistriatis laxissime pilosis glabrescentibus; vaginis arctissime adpressis abbreviatis tortis striatis glabris; pedunculis filiformibus stramineis 4-costatis glabris; capitulis hemisphaericis vel subglobosis griseis.

Acaulescent herb; leaves caespitose, grass-like, ascending, bright-green on both surfaces, 2.5--5.5 cm. long, 2--3 mm. wide at the mid-point, acute at the apex, rather opaquely membranous, not fenestrate, many-striate, very loosely scattered-pilose (especially along the margins) with few, long, weak, whitish hairs, becoming glabrous in age; sheaths very closely appressed to the peduncles, abbreviated, much shorter than the leaves, about 2 cm. long, twisted, striate, glabrous, obliquely split at the apex, the limb erect, short, acute; peduncles very slender or filiform, about 4 per plant, stramineous, 14--17 cm. long, 4-ridged, glabrous; heads hemispheric or almost globose, light-gray, 5--6 mm. in diameter; involucrel bractlets few, whitish, lanceolate, about 2 mm. long and 0.5 mm. wide, attenuate-acute at apex, glabrous; receptacle long-pilose with extremely tenuous hairs; receptacular bractlets whitish, lanceolate, about 1.7 mm. long and 0.4 mm. wide, attenuate at apex, glabrous; staminate florets stipitate: sepals 3, separate, whitish-subhyaline, stiffly erect, lanceolate, about 1.8 mm. long and 0.5 mm. wide, attenuate-acuminate at the apex, glabrous; petals 3, hyaline, the upper free portions elliptic, a-

bout 1 mm. long and 0.5 mm. wide, acute at the apex, glabrous; stamens 3, included; filaments about 0.2 mm. long; anthers yellow; pistillate florets: sepals 3, separate, elliptic-oblongate or oblanceolate, whitish, somewhat concave-navicular, about 3 mm. long and 0.7 mm. wide, long-acuminate at the apex, stiffly erect, glabrous; petals 3, separate, whitish-subhyaline, lanceolate, about 1.9 mm. long and 0.4 mm. wide, attenuate-acute at the apex, glabrous; ovary elliptic, about 0.8 mm. long and 0.5 mm. wide, glabrous, 3-celled, 3-ovulate; style about 1 mm. long, its 3 appendages inserted at about the mid-point, conspicuous, ascending, fusiform, about 0.4 mm. long; stigmas 3, terminal, about 0.4 mm. long.

The type of this distinct species was collected by Geraldo Mendes Magalhães (no. 4345) -- in whose honor it is named -- on a wet campo at Cocalis, Serra do Brucutú, municipio Santa Barbara, Minas Geraes, Brazil, on February 6, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden.

PAEPALANTHUS ACUMINATUS var. *LONGIPILOSUS* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit capitulis parvioribus 8--9 mm. diametro, pedunculis densissime pilosis, pilis adscendentibus subadpressis, et bracteolis involucrentibus valde stramineis.

This variety differs from the typical form of the species in its heads being smaller, only 8--9 mm. wide, its peduncles being very densely pilose with ascending subappressed hairs, and its involucrel bractlets being beautifully stramineous.

The type was collected by Mello Barreto (no. 15011) on a campo at km. 118, Serra do Cipó, municipio Jaboticatubas, Minas Geraes, Brazil, on April 29, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden.

PAEPALANTHUS DIAMANTINENSIS Moldenke, sp. nov.

Herba acaulescens; foliis caespitosis numerosis brunnescentibus gramineis subulato-acutis supra breviter pubescentibus vel puberulis, subtus piloso-pubescentibus, marginis plerumque subrevolutis; vaginis laxis costatis densissime patentibus pubescentibus non tortis, lamina dense albo-ciliata ad apicem albo-barbata; pedunculis gracilibus numerosissimis brunneis vel nigrescentibus 4-costatis complanatis, ad apicem dense puberulis, caetera glabra; capitulis hemisphaericis albis.

Acaulescent herb; leaves caespitose, numerous, ascending when young, eventually reflexed, brunnescent, grass-like, 3--6 cm. long, 2.5--4 mm. wide at the mid-point, subulate-acute at the apex, softly short-pubescent or puberulent on the upper surface, pilose-pubescent in parallel longitudinal lines beneath, the margins often slightly subrevolute; sheaths loose, 3.5--4 cm. long, several-ribbed, not twisted, very densely spreading-

pubescent, obliquely split at the apex, the blade erect, acute, densely white-ciliate, white-barbate at the apex; peduncles slender, very numerous, brownish or nigrescent, 4-costate, flattened, not twisted, rather densely puberulent at the apex, otherwise glabrous or with a very few scattered long weak hairs here and there; heads hemispheric, white, about 8 mm. in diameter; involucrel bractlets large, conspicuous, in several series, closely imbricate and appressed, black, ovate, about 3 mm. long and 2 mm. wide, subacute at the apex, densely white-ciliate along the margins, white-pilose on the back; receptacle densely long-villous; receptacular bractlets linear, subhyaline, about 3 mm. long and 0.3 mm. wide, attenuate at the apex, densely long-villous on the back; staminate florets: sepals 3, connate at the base, the free portion black, elliptic-oblanccolate, about 1.5 mm. long and 0.5 mm. wide, obtuse at the apex, very densely white-barbellate on the back; petals 3, hyaline, united into an infundibular tube about 2 mm. long, glabrous; stamens 3; pistillate florets: sepals 3, connate only at the very base, spatulate, dark-brown or blackish, about 2.6 mm. long and 0.6 mm. wide, obtuse at the apex, very densely long-villous on the back from the base to the white-barbellate apex; petals 3, oblong, hyaline, about 1.3 mm. long and 0.2 mm. wide, very densely white-barbate with erect villous hairs on the back; ovary subglobose, about 0.4 mm. long and wide, 3-celled, 3-ovulate; style abbreviated, about 0.4 mm. long, glabrous, its appendages 3, 0.4--0.5 mm. long.

The type of this species was collected by Hello Barreto (no. 9920) at the edge of a campo, Serra de Gavião, município Diamantina, Minas Geraes, Brazil, on November 20, 1937, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM HETEROPHYLLUM f. **ANGUSTIFOLIUM** Moldenke, f. nov.

Haec forma a forma typica speciei foliis linearibus 2--9 mm. latis recedit.

This form differs from the typical form of the species in having its leaf-blades linear, less than 10 mm. wide at the mid-point.

The type of this form was collected by George Gardner near Port Louis, Mauritius, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

CLERODENDRUM PUTRE var. **SUBGLABRATUM** Moldenke, var. nov.

Haec varietas a forma typica speciei foliis ramisque petiolisque pedunculisque glabratiss et margine calycis triangularidentato recedit.

This variety differs from the typical form of the species in having its branches, petioles, leaf-blades, and peduncles glabrate and the calyx-rim merely triangular-dentate.

The type of this variety was collected by J. M. Hildebrandt (no. 3937) in the jungle of Ankafina, Batsileo, Madagascar, in February 1881, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

PREMNA AMBONGENSIS Moldenke, sp. nov.

Frutex vel arbor; ramis ramisque gracilibus griseis glabris; sarmentis gracillimis brunnescentibus obscure pilosis vel glabrescentibus; petiolis filiformibus piloso-canaliculatis; laminis tenuiter chartaceis lanceolatis longe acuminatis vel subcaudatis integris, ad basin rotundatis, utrinque in venis brevissime pubescentibus; inflorescentiis terminalibus abbreviatis.

Shrub or tree; branches and branchlets slender, grayish, very obtusely tetragonal or subterete, glabrous; twigs very slender, brunnescent, very obscurely scattered-pilose or glabrescent; nodes not plainly annulate; principal internodes 5--15 mm. long; leaves decussate-opposite; petioles filiform, 12--17 mm. long, canaliculate above, pilose in a single line in the canaliculation, otherwise glabrous; blades thin-chartaceous, rather uniformly bright-green on both surfaces, not nigrescent in drying, lanceolate, 5.4--9 cm. long, 1.4--3.2 cm. wide, long-acuminate or subcaudate at the apex, entire, rounded at the base, very shortly pubescent along the venation on both surfaces; midrib very slender, plane above, prominulous beneath; secondaries very slender, 4--7 per side, ascending, slightly arcuate, joined in many loops near the margins, plane above, subprominulous beneath; vein and veinlet reticulation fine, very abundant, rather conspicuous and very slightly subprominulous on both surfaces; inflorescence terminal, cymose, abbreviated; peduncles very slender, 5 mm. long or less, sparsely pilosulous; cyme-branches few, much abbreviated, pilose, spreading, lax; flowers not seen; fruiting-calyx cupuliform, about 3 mm. long, 4--5 mm. wide, nigrescent, glabrous, its rim truncate and subtire; fruit drupaceous, subglobose, nigrescent, about 5 mm. long and wide, glabrous.

The type of this species was collected by Henri Perrier de la Bâthie (no. 10289) at Manongarivo, Ambongo, west Madagascar, in January 1905, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

PREMNA LONGIACUMINATA Moldenke, sp. nov.

Arbor; ramulis tetragonis glabris; sarmentis gracilioribus brunnescentibus lenticellatis sparsissime strigillosis vel pilosulis; petiolis gracillimis pilosulo-canaliculatis brunnescentibus; laminis chartaceis brunnescentibus ovatis longe acuminatis vel subcaudatis integris vel paullo repandis, ad basin rotundatis, supra parce puberulis pernitidis, subtus densiore puberulis; inflorescentiis terminalibus abbreviatis cymosis.

Tree; branchlets tetragonal, light, glabrous; leaf-scars

large, corky, elevated; twigs more slender, brunnescent, lenticellate, very sparsely strigillose or pilosulous with scattered hairs; nodes not annulate; principal internodes 1.5--2 cm. long; leaves decussate-opposite; petioles very slender, 1.5--2.5 cm. long, canaliculate above, pilosulous in the canaliculation, otherwise glabrous or glabrescent, brunnescent; blades chartaceous, brunnescent, ovate, 8--13 cm. long, 4--5.5 cm. wide, long-acuminate or subcaudate at the apex, entire or slightly repand-margined, rounded at the base, sparsely and obscurely puberulent above and very shiny, more densely puberulent beneath; midrib plane or very slightly subimpressed above, prominent beneath; secondaries very slender, 5--7 per side, ascending, rather straight, sometimes bifurcate at about the middle, arcuate at the very margin and rather indistinctly joined in many small loops, plane above, prominulous beneath; vein and veinlet reticulation abundant, somewhat conspicuous and subprominulous above, only the larger parts prominulous beneath; inflorescence terminal, cymose, abbreviated; peduncles abbreviated, 7--10 mm. long, rather densely pilosulous; cyme-branches few, short, loosely spreading, densely appressed-pilosulous or strigillose; flowers not seen; fruiting-calyx shallowly cupuliform or subpatelliform, to 3 mm. long, 10--11 mm. wide, nigrescent, its rim shallowly lobed, probably glabrous; fruit drupaceous, elliptic, about 10 mm. long and 8 mm. wide, nigrescent, with a very fleshy exocarp, probably glabrous.

The type of this species was collected by H. Perrier de la Bâthie (no. 1343) at Boiry, west Madagascar, before 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

PREMNA HUBERTI Holdenke, sp. nov.

Arbor parva; ramis ramulisque gracilibus obtusissime tetragonis griseis, in statu juventute densissime cinereo-puberulis vel flavidis, in statu senectute glabrescentibus; petiolis gracillimis dense canescento-vel flavido-puberulis; laminis chartaceis supra nitidis oblongo-ellipticis subtus densissime resinoso-lepidotis et brevissime puberulis, supra dense impresso-punctatis integris, attenuato-acutis, at basin acutis; inflorescentiis axillaribus abbreviatis furfuraceo-puberulis.

Small tree; branches and branchlets slender, very obtusely tetragonal or subterete, gray, the younger parts and twigs very densely cinereous-puberulous or flavidous and resinous-lepidote, glabrescent in age; nodes not annulate; principal internodes 5--19 mm. long or less; leaves decussate-opposite, numerous on the younger parts; leaf-scars very small but corky and elevated; petioles very slender of subfiliform, 5--10 mm. long, densely puberulent with canescent or flavidous extremely short hairs; blades chartaceous, gray-green and shiny above, very densely resinous-lepidote and very short-puberulent beneath,

densely impressed-punctate and obscurely short-puberulent above, very narrowly oblong-elliptic, entire, gradually narrowed to the acute apex, acute at the base; midrib slender, plane and densely puberulent above, very prominent beneath; secondaries very slender, short, 8 or 9 per side, ascending, very slightly arcuate near the margins, not joining at the margins, plane or subprominulous above, subprominulous beneath; vein and veinlet reticulation rather obscure on both surfaces; inflorescences axillary, cymose, abbreviated, about 1.5 cm. long and wide, rather dense, many-flowered, very densely furfuraceous-puberulent with cinereous or flavidous hairs throughout; calyx cupuliform, 1.5--1.8 mm. long and wide, densely resinous-lepidote, its rim subtruncate, with 5 very tiny teeth; corolla light-greenish, about 5.5 mm. long, the exposed part densely resinous lepidote on the outer surface, united almost to the apex, the lobes whitish, very small, about 1 mm. long, erect, acute; stamens 4, inserted at about the middle of the corolla-tube, equalling the tube or subexserted; ovary subglobose, about 1 mm. long and wide, densely resinous-lepidote; pistil exserted; stigma shortly bifid.

The type of this species was collected by Henri Humbert (no. 12938) in the valley of the Manambolo, on the right bank (basin of Mandrare) in the vicinity of Isomono, alt. 400--900 m., Madagascar, in December 1933, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

PREMNA HUMBERTI var. **OBTUSA** Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum ad apicem obtusis vel emarginatis recedit.

This variety differs from the typical form of the species in having its leaf-blades obtuse or even emarginate at the apex.

The type was collected by Henri Humbert (no. 14145) in xerophilous bush in the flood basin of the Mananara, an affluent of the Mandrare, Col d'Ambato and Pentes Orientales du Vohipaly, altitude about 400 m., Madagascar, in February 1934, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

PREMNA LONGIPETIOLATA Moldenke, sp. nov.

Frutex; ramis ramulisque sarmentisque glabris; petiolis sub-filiformibus stramineis glabris; laminis chartaceis brunnescentibus utrinque glaberrimis nitidisque ellipticis vel elliptico-lanceolatis obtusis acutisve acuminatisve, ad basin acutis.

Shrub to 4 m. tall; branches and branchlets slender, rather obtusely tetragonal, the older ones grayish, the younger ones stramineous, glabrous; twigs very slender, stramineous or yellowish, glabrous, slightly flattened; nodes annulate; principal internodes 0.5--5 cm. long; leaves decussate; leaf-scars rather small, but corky-ascending and prominent; petioles very slender

or subfiliform, 1.3--2.1 cm. long, stramineous, canaliculate above, glabrous, somewhat costate in drying; leaf-blades chartaceous, uniformly dark-green on both surfaces, brunnescenscent in drying, very smooth and shiny on both surfaces, elliptic or elliptic-lanceolate, 3--8 cm. long, 1.3--3.4 cm. wide, varying from obtuse to acute or short-acuminate at apex, acute at base, glabrous throughout; midrib slender, plane above, subprominulous beneath; secondaries slender, 4 or 5 per side, plane on both surfaces or very obscurely subprominulous above, arcuate-ascending, not joined at margins; vein & veinlet reticulation mostly very obscure or indiscernible on both surfaces; inflorescence terminal, cymose, large, 4--8 cm. long, to 10 cm. wide, very lax and wide-spreading when mature, more congested when beginning anthesis; peduncles stramineous, 1.5--2 cm. long, glabrous or slightly appressed-strigillose; cyme-branches stramineous, appressed-strigillose, tetragonal, spreading; bractlets lanceolate, a pair at every cyme-furcation, 1.5--4 mm. long, rather rigidly divergent appressed-strigillose, attenuate; calyx campanulate, 1.5--2 mm. long and wide, stramineous or herbaceous, glabrous, its rim distinctly lobed, the lobes erect, triangular-acute or obtuse; corolla white, about 4 mm. long, glabrous, united for $\frac{2}{3}$ its length, villous in the throat, the 5 lobes erect, unequal, rounded at apex; stamens 4, equaling the corolla or subexserted; pistil exserted; fruiting-calyx shallowly cupuliform or subpatelliform, about 2 mm. long and 4 mm. wide, stramineous, glabrate or very obscurely scattered-pilosulous, its rim irregularly lobed; fruit drupaceous, not very fleshy, subglobose, about 4 mm. long & wide, nigrescent, glabrous.

The type of this distinct species was collected by André Seyrig (no. 304) in the vicinity of Ampandrandara, Anivorano, in lateritic soil in November 1942, and is deposited at Paris.

PREMNA VENULOSA Moldenke, sp. nov.

Frutex scandens; ramulis glabris; petiolis filiformibus glabris; laminis tenuiter membranaceis lanceolato-ovatis apiculato-acutis vel acuminatis integris, ad basin rotundatis vel sub-acutis utrinque glabris; inflorescentiis terminalibus congestis.

Woody vine; branches and branchlets rather slender, grayish, very obtusely tetragonal or subterete, lenticellate, glabrous; twigs very slender, somewhat brunnescenscent, glabrous, lenticellate; nodes slightly annulate; principal internodes 0.8--6.5 cm. long, mostly very abbreviated on branchlets; leaf-scars elevated, corky; leaves decussate; petioles filiform, 5--8 mm. long, glabrous; leaf-blades thin-membranous, uniformly bright-green on both surfaces, somewhat brunnescenscent in drying, lanceolate-ovate, 3.5--6 cm. long, 1.8--2.8 cm. wide, often conduplicate, attenuate-acute or short-acuminate at apex, short-apiculate at the very tip, entire, rounded or subacute at base, glabrous on both surfaces; midrib very slender, plane above, slightly sub-

prominulous beneath; secondaries filiform, 3 or 4 per side, arcuate-ascending, plane on both surfaces, conspicuous beneath; vein & veinlet reticulation very fine, abundant, plane on both surfaces or rather obscure above, conspicuous beneath; inflorescence terminal, cymose, 2--3 cm. long, 2--3.5 cm. wide, rather congested, many-flowered; peduncles very slender, abbreviated, about 1 cm. long, glabrous; cyme-branches few, short, spreading or reflexed, glabrous; bractlets inconspicuous, linear, few, 3--4 mm. long, glabrous; calyx broad-campanulate, about 1.5 mm. long & wide, glabrous, its rim sinuate-toothed; corolla white, its tube equaling the calyx, its 4 lobes reflexed, ovate, about 1.5 mm. long, obtuse at apex, glabrous outside, long-pilose in the throat; stamens 4.

The type of this species was collected by Henri Perrier de la Bâthie (no. 1190) in rocky forests on Plateau d'Ankaru, Madagascar, in January 1901, and is deposited at Paris.

PREMNA DECARYI Moldenke, sp. nov.

Frutex; ramulis glabris; petiolis filiformibus glabris; laminis tenuiter membranaceis ovatis acutis utrinque glabris ad basin late rotundatis; inflorescentiis axillaribus terminalibusque aggregatis dense multifloris ubique minute puberulis.

Shrub about 2 m. tall; branchlets slender, obscurely tetragonal or subterete, grayish, lenticellate, glabrous; twigs very slender, brunnescent, glabrous; nodes not annulate; principal internodes 2--4.5 cm. long; leaves decussate; petioles filiform, 1--2.2 cm. long, glabrous; leaf-blades thin-membranous, brunnescent in drying, ovate, 3.2--6.5 cm. long, 1.7--2.5 cm. wide, acute at apex, broadly rounded at base, entire, glabrous on both surfaces; midrib very slender, plane above, subprominulous beneath; secondaries filiform, 3 or 4 per side, arcuate-ascending, plane on both surfaces; vein and veinlet reticulation fine, abundant, usually not conspicuous above, but conspicuous (though plane) beneath; inflorescence axillary in the uppermost leaf-axils and terminal, usually several aggregated into a large terminal mass, cymose, each cyme about 4 cm. wide, densely many-flowered; peduncles elongate, erect or ascending, 2.5--5.5 cm. long, minutely puberulent, substramineous, usually sulcate & costate; cyme-branches strictly bifurcate, straight, erect or ascending, not lax or reflexed, minutely puberulent; bractlets linear, a pair at each furcation, 3--4 mm. long, minutely puberulous; calyx narrow-campanulate, nigrescent, ca. 1 mm. long & wide, glabrous, its rim very shortly 4-toothed; corolla 2--2.5 mm. long, white, its tube equaling the calyx, its lobes rounded at apex, densely pilose in the throat.

The type was collected by R. Decary (no. 4781) among gneiss rocks at Befotaka, near Farafangana, Madagascar, on August 12, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ADDITIONAL NOTES ON THE ERIOCAULACEAE. IV

Harold N. Moldenke

In addition to the abbreviations for the names of herbaria listed by me in *Phytologia* 3: 179--180 (1949) the following are also employed in this installment: Gu = University of Georgia at Athens, Rg = J. T. Roig herbarium, Estacion Experimental Agronomica at Santiago de las Vegas, Cuba, S = Naturhistoriska Riksmuseet at Stockholm, Sm = Southern Methodist University at Dallas, Texas, and Wb = Rev. William Brown herbarium, Jesuit Tertianship, Auriesville, New York.

ERIOCAULON Gronov.

An as yet unidentified species of this genus is recorded by Luetzelburg, *Estud. Bot. do Nordeste* 3: 147 & 150 (1923) from São Marzello on the Rio Preto, Bahia, Brazil, where it is said to be frequent in carrasco and typical of the brejo. Herzog describes it as "forma petalorum tubo carnosio incrassato petallis mox solutis".

ERIOCAULON AFZELIANUM Wikstr.

Additional citations: SENEGAL: Monod 2 (F--photo, N--photo, Sg--photo, Z--photo).

ERIOCAULON AQUATILE Körn.

Additional citations: BRAZIL: Minas Geraes: J. E. Oliveira 114 [*Herb. Jard. Bot. Belo Horiz.* 32602] (H).

ERIOCAULON ARECHVALETAE Herter

Literature references: Herter, *Flórmula* 44 [as E. latifolium Arech.]. 1930.

Additional citations: URUGUAY: Moldenke & Moldenke 19694 (S, F, Z).

ERIOCAULON BASSACENSE Moldenke

Citations: FRENCH INDOCHINA: Laos: Poilane 15668 (N--type).

ERIOCAULON BEAUVERDI Moldenke

Additional citations: BRAZIL: São Paulo: Moldenke & Moldenke 19643 (F, S).

ERIOCAULON BIFISTULOSUM Van Heurck & Muell.-Arg.

Additional citations: FRENCH WEST AFRICA: French Soudan: Monod s.n. [27-XI-45] (An, An). FRENCH GUINEA: Schnell 2141 (An, An).

ERIOCAULON BREVIFOLIUM Klotzsch

Additional citations: BRITISH GUIANA: Herb. Forest Dept. Br. Guian. WB.277 (N, Wb).

ERIOCAULON BREVIPEDUNCULATUM Merr.

The species has been collected at an altitude of 3680 m. in New Guinea.

Additional citations: NEW GUINEA: Papua: Brass 4365 (N), 4367 (N).

ERIOCAULON CINEREUM R. Br.

This species is recorded [as E. Sieboldianum Sieb. & Zucc.] from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 66 (1946) and is described as a therophyte.

Additional citations: FRENCH INDOCHINA: Tonkin: Poilane 8057 (N), 8067 (N), 8069 (N), 8081 (N), 8086 (N), 8088 (N), 8093 bis (N), 8096 (N).

ERIOCAULON COLLINUM Hook. f.

This species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is called a therophyte according to Raunkiaer's classification of life-forms.

ERIOCAULON CONICUM (Fyson) C. E. C. Fisch.

This species is recorded [as "E. conicum Fisch."] from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is described as a therophyte.

ERIOCAULON CONIFERUM Herzog

This species is recorded from Rio Preto (Abaixo d'Agua), and from Rio Grande, Bahia, by Luetzelburg in Estud. Bot. do Nordeste 3: 147 & 150 (1923) and is said to be typical of the brejo.

ERIOCAULON CRASSISCAPUM Bong.

Additional citations: BRAZIL: Minas Geraes: Magalhães Gomes 4301 (N, N); Mello Barreto 2553 [Herb. Jard. Bot. Belo Horiz. 10692] (N).

ERIOCAULON CUSPIDATUM Dalz.

This species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is described as a therophyte.

ERIOCAULON DECANGULARE var. LATIFOLIUM Chapm.

Additional citations: FLORIDA: Franklin Co.: Saurman s.n. [Apalachicola, 1867] (Pr).

ERIOCAULON DECIMFLORUM Maxim.

Additional citations: MANCHUKUO: Komarov 339 (N).

ERIOCAULON DECIPIENS N. E. Br.

Synonymy: Eriocaulon decipiens (N. E. Br.) Th. Arwidsson, Bot. Notiser 1934: 84. 1934.

Arwidsson, in the reference cited above, maintains that Brown's original description of this species must be modified, but such emendation of a description is not justification for changing the accreditation of the binomial as noted above. Arwidsson states that the leaves of this species are about 8 cm. long, 6--7 mm. wide at the base, 4 mm. wide at the mid-point, acute, that the head is solitary and 1 cm. wide, and that the involucre is light. He records it from Nyasaland and Southern Rhodesia and states that it is closely related to E. Sonderianum Körn.

ERIOCAULON DESLANDESII Alv. Silv.

Additional citations: BRAZIL: Santa Catharina: Reitz 2985 (N).

ERIOCAULON DIANAE Fyson

This species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is called a therophyte according to Raunkiaer's classification of life-forms.

ERIOCAULON DIANAE var. LONGIBRACTEATUM Fyson

This variety is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 [as "var. longibracteata"] (1946) and is described as a geophyte.

Additional citations: INDIA: Bombay: C. E. C. Fischer 4523 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON DIANAE var. RICHARDIANUM Fyson

This variety is recorded from Mysore, India [as "var. Richardiana"] by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is described as a geophyte.

Additional citations: INDIA: Bombay: Madras Herb. 9483 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON DICTYOPHYLLUM Körn.

Additional citations: BRAZIL: Paraná: Hatschbach 1191 (N). São Paulo: Brade 12226 [Herb. Rio de Jan. 30344] (Ja, N).

ERIOCAULON DIMORPHOPETALUM Moldenke

Citations: VENEZUELA: Bolívar: Steyermark 59264 (N--type).

ERIOCAULON DREGEI Hochst.

According to Arwidsson in Bot. Notiser 1934: 83 (1934) this species has obtuse leaves, olivaceous involucreal bractlets, and

flowers that are 3 mm. long. He cites Drège 4101.

ERIOCAULON ECHINOSPERMUM C. Wright

Additional citations: CUBA: Pinar del Río: C. Wright 3738 (Pa--isotype).

ERIOCAULON ECHINULATUM Mart.

The species has been collected in swamps at the foot of the White Cloud Hills in Kwangtung.

Additional citations: CHINA: Kwangtung: T. Sampson s.n. [Canton] (Pa); Samson 958 [490] (D--824270). FRENCH INDOCHINA: Cambodia: Poilane 14017 (N). Laos: Poilane 15468, in part (N). Tonkin: Poilane 8085 (N).

ERIOCAULON EDWARDSII Fyson

The species has been collected at 600 feet elevation and distributed as "E. edwardsii".

Additional citations: INDIA: Orissa: Mooney 2905 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON EHRENBERGIANUM Klotzsch

This species has been collected in black muck of swamps, springy bogs, wet bottoms, marshes, and wet places, including the steep slopes of barrancas at altitudes of 4500 to 6000 feet, blooming in January, February, July, August, and September. Standley describes it as abundant in marshlands in Guatemala. It has often been confused with E. Benthami Kunth and has even been mixed on the same sheet with E. microcephalum H.B.K. The heads are white. The Ehrenberg 57 at Pomona, cited below, is inscribed "Original, sehr wertvoll!"

Additional citations: MEXICO: Federal District: Reiche s.n. [XI.1912; Herb. Inst. Biol. Univ. Nac. Mex. 2598] (Me). Hidalgo: Pringle 8989 [Herb. Inst. Biol. Univ. Nac. Mex. 2607] (Cm, D--522842, Gg--155600, Me, Me, Me, Vt). Jalisco: Dudley Herb. 54390 (Du); Edw. Palmer 44 (D--824266, Pa); Pringle 2665 [Herb. Inst. Biol. Univ. Nac. Mex. 2597] (Me), 4033 [Herb. Inst. Biol. Univ. Nac. Mex. 2596] (Me, Me, Me, Ob--23882, Vt). México: Barkley, Rowell, & Paxson 629 (Au); C. A. Ehrenberg 57 [Herb. Inst. Biol. Univ. Nac. Mex. 2602] (Me--isotype, Me--isotype, N--isotype, Po--185872--isotype); J. G. Schaffner 226, in part (Cm). Michoacán: Barkley, Paxson, & Webster 2736 (N); Hitchcock & Stanford 7201 (Pl--130319, Po--266810, Se--53441, W--1309167); Leavenworth 659 (N). State undetermined: Aschenborn 531 (Br). GUATEMALA: Chimaltenango: Skutch 617 (Du--230756). El Quiché: P. C. Standley 62481 (N). Sacatepéquez: P. C. Standley 64692 (N).

ERIOCAULON EKMANII Ruhl.

Additional citations: CUBA: Pinar del Río: Moldenke & Mol-

denke 19873 (Es, N), 19874 (Es, Lg, N), 19925 (Es, Lg, N, Sm), 19928 (Es, N), 19934 (N); Moldenke, Moldenke, León, Alain, & Acuña 15263 (Es), 15264 (Es).

ERIOCAULON EPAPILLOSUM Ruhl.

The specimen from "Uberabinha Ufer" cited by Ruhland is from the state of Minas Geraes, Brazil.

Additional citations: BRAZIL: Minas Geraes: J. E. Oliveira 934 [Herb. Jard. Bot. Belo Horiz. 42431] (H).

ERIOCAULON FORMOSANUM Hayata

The species has been found in swamps at the foot of the White Cloud Hills in Kwangtung and has been confused with "E. truncatum Buch.-Ham."

Additional citations: CHINA: Kwangtung: Samson 256 [127] (D--824275). FORMOSA: Tanaka & Shimada 13574 (D--697328).

ERIOCAULON FULIGINOSUM C. Wright

The species has been collected in anthesis also in January, and has been mixed with E. melanocephalum Kunth.

Additional citations: BRITISH HONDURAS: Gentle 993 (D--722699, Gg--245655). CUBA: Las Villas: Combs 588 (D--659078); León & Cazañas 5910 (Ha), 5983 [Herb. Marie-Victorin 20584] (Vi). Oriente: Acuña 12379 (Es), s.n. [Herb. Roig 3643] (Rg); R. A. Howard 6019 (N, N, N); C. Wright 3238 (Pa). Pinar del Río: Acuña 10687 (Es), 14902 (Es); León & Alain 19431, in part (N), 19502 (N); Moldenke & Moldenke 19883 (Es, Lg, N), 19919 (N); Moldenke, Moldenke, León, Alain, & Acuña 15266 (Es), 15267 (Es); C. Wright 3239 (Pa--isotype), 3740 (Pa). Province undetermined: León, Victorin, & Alain 19626 (N); C. Wright 3739 (Pa)

ERIOCAULON GIBBOSUM Körn.

Körnische divided this species into two varieties: (1) var. brevifolium Körn., typified by Gardner 5275 and Lund s.n., and var. longifolium Körn., typified by Gardner 4333, Lund s.n., Riedel 2416, Vauthier s.n., and Weddell 2128. The first variety may be regarded as typical of the species and its cotypes are also cotypes of the species. The second variety I believe may also be reduced to synonymy here. The species is listed by Malme in his Phanerogamen 3: 7 (1933). It is recorded from Rio Preto, Goyaz, and São Bento dos Lagos, Bahia, by Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923) and is said to be typical of the brejo. On page 147 he lists it as "E. gibbosum var. beta longifolia" and on page 150 as "E. gibbosum var. longifolia". Herzog is responsible for the identifications in this work.

Additional citations: BRAZIL: Goyaz: Riedel 2416 (M). Rio de

Janeiro: G. Gardner 848 (T). State undetermined: G. Gardner 4384 (N).

ERIOCAULON GRACILE Mart.

Additional citations: INDIA: State undetermined: R. Wight 2367b (N). FRENCH INDOCHINA: Cambodia: Poilane 14357 (N).

ERIOCAULON GRAPHITINUM F. Muell. & Tate

Literature references: R. Tate, Trans. Roy. Soc. S. Austr. 19: 82. 1895.

This species was first collected by Tietkens on the Tietkens Expedition in the latitude of Engoordina on the Finke River in South Australia in the year 1889.

ERIOCAULON GREGATUM Körn.

The species has been collected at altitudes of 4500 to 5500 feet, and has been confused with E. achiton Körn.

Additional citations: INDIA: Assam: C. B. Clarke 18585a (F-photo, K, N--photo, Sg--photo, Z--photo). State undetermined: C. B. Clarke 18637b [Sohra] (F--photo, K, N--photo, Sg--photo, Z--photo).

ERIOCAULON GUADALAJARENSE Ruhl.

Additional citations: MEXICO: Jalisco: Pringle 1734 (Br--isotype, Cc--isotype, D--824271--isotype, Pa--isotype).

ERIOCAULON GUIANENSE Körn.

The species has been collected around pools of water in rocks, blooming in september, and has been confused with Paepalanthus Lamarckii Kunth.

Additional citations: VENEZUELA: Amazonas: Steyermark 58518 (N). State undetermined: Lasser 146 [Llanos de Calabozo en Cunaga; Herb. Nac. Venez. 18470] (N, Ve). BRITISH GUIANA: C.B. Clarke s.n. [1897] (N).

ERIOCAULON HENRYANUM Ruhl.

The species has been collected in swampy meadows at altitudes of 9600 to 12,000 feet, blooming from May to October.

Additional citations: CHINA: Yunnan: Ducloux 308 (N); E. E. Maire 3524 (N); R. P. Maire 3419 (N); J. F. C. Rock 4587 (N), 5349 (N), 5459 (N), 5882 (N), 10704 (N), 24927 (Gg--236164). FRENCH INDOCHINA: Tonkin: Poilane 1322 (N).

ERIOCAULON HETERODOXUM Moldenke

This species has been collected on the muddy shore of the river at Mazaruni Station, British Guiana, on September 27, 1937, by N. Y. Sandwith, who describes it as having greenish-white or dirty-cream heads, 6 stamens, 3 styles, and the sepals

united with a split spathaceous sheath.

Additional citations: BRITISH GUIANA: N. Y. Sandwith 1603 (K).

ERIOCAULON HILDEBRANDTII Körn.

Additional citations: MADAGASCAR: Hildebrandt 3598 (F--photo of isotype, N--isotype, N--photo of isotype, Sg--photo of isotype, W--808233--isotype, Z--photo of isotype).

ERIOCAULON HONDOENSE Satake

Literature references: Satake, Bot. Mag. Tokyo 51: 288, fig. 3. 1937; Hara, Bot. Mag. Tokyo 53: 400. 1938. The first of these is the original description.

The species has been collected in marshy places near Shoya, blooming in late August to September, and is known from the districts of Kyushu, Honshu, and Yezo. It has also been collected in anthesis in July and October. The vernacular name "nippon-inunohige" is recorded by Satake. The species has been confused with E. Miquelianum Körn., but is stouter, with bigger and longer involucral bractlets. Hara records "Eriocaulon Miquelianum (non Koernicke) auct. Jap. pro parte" as a synonym.

Additional citations: JAPAN: Hokkaido: Maximowicz s.n. [1861] (C). Hondo: Ohwi s.n. [Mizoro, 26.X.1930] (Ms, N). Honshu: Y. Matsumura 6676 (N); Ohwi s.n. [26.X.1930] (N); Yushun s.n. [12-7-1905] (N).

ERIOCAULON HUMBOLDTII Kunth

This species is listed by Pittier as "Eriocaulon Holboldii" in his La Mesa de Guanipa, Ensayo de Fitografía 22 (1942); on page 30 of the same work he spells the binomial correctly and says the plant grows on the shore of Río Tigre near El Tigrito. The collection cited by Ruhland from "Raudal de Aturez" is from Delta Amacuro, Venezuela. The species has been collected at altitudes of from 80 to 1065 m., growing 35--40 cm. tall, with white flowers, blooming in March and November. The Steyermark 59043 collection, cited below, is mixed with some non-ericaulaceous plant; he records the common name "paja vinera".

Additional citations: COLOMBIA: Méta: Cuatrecasas 7835 (W--1774230). VENEZUELA: Amazonas: Ll. Williams 13432 (Ve). Anzoátegui: H. Pittier 14303 (Ve, W--1778563), 14764 (W--1833169). Bolívar: Lasser 1716 (N); G. G. Simpson 30 [Herb. Nac. Venez. 18467] (Ve, W--1775639); Steyermark 58549 (N), 59043 (F--1209389, N); Tamayo 2906 (N); Ll. Williams 12755 [Herb. Nac. Venez. 18468] (Ve, W--1800771). BRAZIL: Amazonas: Ule 7928 (N, W--1615022). Mattogrosso: J. T. Baldwin, Jr., 3043 (W--1834324).

ERIOCAULON HUMILE Moldenke

Additional citations: INDIA: Bombay: Blatter, Hallberg, &

McCann 28009, in part (N--type, Xa--isotype).

ERIOCAULON INDICUM Moldenke

Additional citations: INDIA: Bombay: Blatter, Hallberg, & McCann 28071 (N, Xa); Herb. Blatter 2566 (II, Xa); Santapau 891 (Xa), 2185 (N, Xa), 2924 (N--type, Xa--isotype), 4843 (N, Xa).

ERIOCAULON INSULARE Ruhl.

This species has been collected in anthesis in October and December. and has been confused with E. fuliginosum C. Wright and E. scirpoides Griseb.

Additional citations: CUBA: Pinar del Rio: Ekman 17808 (Ha--isotype); León & Roca 6987 (Ha).

ERIOCAULON INTERMEDIUM Körn.

Additional citations: FRENCH INDOCHINA: Tonkin: Poilane 8089 (N).

ERIOCAULON INYANGENSE Arwidsson

Additional citations: SOUTHERN RHODESIA: Gilliland 85 (Rh); H. E. Hornby H.2388 [Govt. Herb. Salisbury 13417] (F--photo, N--photo, Rh, Rh, Sg--photo, Z--photo); Wild 1076 [Govt. Herb. Salisbury 14888] (Rh), 1162 [Govt. Herb. Salisbury 15100] (N, Rh).

ERIOCAULON KÖRNICKIANUM Van Heurck & Muell.-Arg.

Additional citations: OKLAHOMA: Pushtamaha Co.: E. J. Palmer 8320 (Gg--183013). TEXAS: Polk Co.: Tharp 42-6 (N), 42-7 (N, N).

ERIOCAULON KUNTHII Körn.

Additional citations: BRAZIL: Minas Geraes: Mexia 5745 (Gg--286189).

ERIOCAULON LACTEUM Rendle

Additional citations: SOUTHERN RHODESIA: Brain 9644 [Govt. Herb. Salisbury 10736] (Rh); Colville 72 [Govt. Herb. Salisbury 13894] (Rh); Corby 20 [Govt. Herb. Salisbury 20329] (F--photo, N--photo, Rh, Sg--photo, Z--photo); Dehn 342 [Govt. Herb. Salisbury 8363] (Rh); Gilliland 507 (Rh), 986 (Rh); Herb. Queen Victoria Memorial 7177 (N, Rh); Ratray 1371 [Govt. Herb. Salisbury 21185] (N, Rh); Wild 1081 [Govt. Herb. Salisbury 14893] (Rh).

ERIOCAULON LACUSTRE Ruhl.

The species has been confused with E. melanocephalum var. longipes Griseb.

Additional citations: CUBA: Pinar del Rio: Ekman 17877 (Ha--

isotype).

ERIOCAULON LANCEOLATUM Miq.

Additional citations: INDIA: Bombay: W. A. Talbot 2947, in part (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON LANCEOLATUM var. PILOSUM Moldenke

Additional citations: INDIA: Bombay: Herb. Blatter 2567 (N, Ka), 2568 (N, Ka); Santapau 2182 (F--photo of type, N--isotype, N--photo of type, Sg--photo of type, Ka--type, Z--photo of type), 4845, in part (N, Ka); W. A. Talbot 2947, in part (F--photo, K, N--photo, Sg--photo, Z--photo).

ERIOCAULON LAOSENSE Moldenke

Citations: FRENCH INDOCHINA: Laos: Boilane 15468, in part (N--type).

ERIOCAULON LATIFOLIUM J. Sm.

Original publication: J. Sm. in Rees, Cycl. 13. 1809.

Additional citations: FRENCH GUINEA: Dalziel 8247 (F--photo, N--photo, Sg--photo, W--1272980, Z--photo); Schnell 2271 (An, F--photo, N--photo, Sg--photo, Z--photo).

ERIOCAULON LEPTOPHYLLUM Kunth

Literature references: Kunth, Enum. Pl. 3: 549. 1841; Steud., Syn. Pl. Cyp. 2: 270. 1855; Körn. in Mart., Fl. Bras. 3 (1): 494. 1842-71; Ruhl. in Engl., Pflanzenr. 4 (30): 57. 1903; Abbiatti, Bol. Soc. Argent. Bot. 1: 280--281. 1946; Abbiatti, Rev. Mus. La Plata, new ser., 6: 326--328, figs. 4 & 5. 1946.

Additional citations: BRAZIL: Paraná: Reiss s.n. [May 29, 1934] (N).

ERIOCAULON LEUCOMELAS Steud.

This species is recorded [as E. melaleucum Mart.] from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is described as a therophyte. It has been collected at altitudes of 8000 feet.

Additional citations: INDIA: Madras: J. S. Gamble 12986 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON LINEARE Small

Literature references: Lyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944.

Lyles and Robertson in the reference cited above state that this species is found mostly in Coastal Plain pinelands, but occasionally in acid swamps or ponds, in Florida, Alabama, and Georgia. They differentiate the species from E. compressum Lam. and E. decangulare L. by stating that in the two latter the

flower-heads are more than 10 mm. in diameter when mature and the scape is 10--14-ridged, while in E. lineare the flower-heads are less than 10 mm. in diameter when mature and the scapes are only 3--5-ridged. The species has been collected in bogs, shallow pinebarren ponds, on lake shores, and in wet mucky sandy strand of lakes, in anthesis from March to June and in August. Actual specific localities include New Smyrna, Keystone Heights, Palatka, Ensley, and Jackson Lake, Florida; Moultrie, Georgia; and near Hoot's Nursery, East Flat Rock, North Carolina. It has been confused with E. septangulare With., E. compressum Lam., E. flavidulum Michx., E. Ravenelii Chapm., and Lachnocaulon minus (Chapm.) Small.

Additional citations: NORTH CAROLINA: Henderson Co.: Blomquist & Correll 5142 (H--39953). GEORGIA: Baker Co.: Thorne 1581 (Gu--24156). Colquitt Co.: W. B. Baker s.n. [Moultrie, 4-23-38] (Gu--28431). Santa Rosa Co.: R. M. Harper 85 (Ba). County undetermined: A. Gray s.n. (Br). FLORIDA: Clay Co.: Murrill s.n. [Keystone Heights, 3/28/39] (Fl--31246). Escambia Co.: Goodale 69827 (H--65763). Leon Co.: Wiegand & Manning 681 (N, Po--216756). Putnam Co.: C. S. Williamson s.n. [Palatka, Apr.] (D--824274). Volusia Co.: H. C. Beardslee, Jr., 37 (St--24085), s.n. [New Smyrna, March 1925] (Ob--94484). ALABAMA: Baldwin Co.: R. M. Harper 22 (Ba, D--637048).

ERIOCAULON LINEARIFOLIUM Körn.

Additional citations: BRAZIL: Piahy: G. Gardner 2954 (N-isotype). BOLIVIA: Santa Cruz: Kuntze s.n. [Velasco, VII.92] (N).

ERIOCAULON LONGIFOLIUM Nees

The species has been collected at altitudes of 10--30 m., and has been confused with E. longifolium var. Wallichianum Burbidge, E. Wallichianum Mart., E. sexangulare L., and E. sexangulare var. longifolium Hook. f. -- in fact, the Burbidge specimen cited below was identified at various times with each of the first three of these names!

Additional citations: CEYLON: Alston 1069 (K); J. Fraser 55 (W--45306). FEDERATED MALAY STATES: Pahang: M. R. Henderson 24038 (N). STRAITS SETTLEMENTS: Singapore: Kuntze 6063 (N). BRITISH NORTH BORNEO: Burbidge s.n. (D--824285). SARAWAK: Mjoberg 211 (N). NEW GUINEA: Papua: Brass 5751 (N), 5752 (N). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Hooker s.n. (K).

ERIOCAULON LONGIPEDUNCULATUM H. Lecomte

The species is listed by E. H. Walker in Contrib. U. S. Nat. Herb. 30 (1): 380. 1947.

ERIOCAULON LUZULAEFOLIUM Mart.

The type collection of this species was made by Gomez and Bruce in Silhet, Assam, and is Wallich 6071. The Philadelphia isotype has an incorrect label on it, reading "6069 Wall.", which is the number of the E. oryzetorum type collection. Another sheet in the same herbarium is mis-labeled as E. Brownianum Mart.

Additional citations: INDIA: Assam: H. Bruce s.n. [Wallich 6071] (D--324255--isotype); Gomez & Bruce s.n. [Wallich 6071] (C--isotype, T--isotype). East Bengal: W. Griffith 5590 (K). Orissa: W. S. Atkinson 21731 (K). State undetermined: Wallich s.n. (D--324269). BURMA: W. Griffith 5586 (K). LOCALITY OF COLLECTION UNDESIGNATED: Hooker s.n. [E. Indies] (C).

ERIOCAULON MAGNIFICUM Ruhl.

Additional citations: BRAZIL: São Paulo: Hermendorff 468 [Herb. Mus. Nac. Rio de Janeiro 47667] (Ja, N).

ERIOCAULON MAGNUM Abbiatti

Literature references: Abbiatti, Rev. Mus. La Plata Bot., n. s., 6: 323, pl. 1, figs. 2 & 3. 1946; Abbiatti, Bol. Soc. Argent. Bot. 1 (4): 280--281. 1946.

The species has been collected in pools in marshes, blooming in October.

Additional citations: ARGENTINA: Chaco: T. Meyer 2003 [Herb. Inst. Miguel Lillo 72633] (N, N), 3055 [Herb. Inst. Miguel Lillo 72632] (N, N).

ERIOCAULON MAJUSCULUM Ruhl.

The species has been recorded from Morro Acuf, alt. 2300 m., in the Serra dos Orgãos, Rio de Janeiro, by Luetzelburg in Estud. Bot. do Nordeste 3: 147 & 150 (1923) and is said to be typical of the Serra dos Orgãos.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2529 [Herb. Jard. Bot. Belo Horiz. 8259] (N).

ERIOCAULON MARGARETAE Fyson

The species has been recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and is described as a therophyte.

ERIOCAULON MARIAE Fyson

This species is known from the Pulney Hills of Madras, India.

ERIOCAULON MATOPENSE Rendle

Original description: Rendle, Journ. Linn. Soc. Lond. Bot. 37: 475--476. 1906.

The type of this species was collected by Gibbs in Southern

Rhodesia, It is said to be closely related to E. lacteum, but is a smaller plant with narrower leaves and without the sharp points to its bracts.

Additional citations: SOUTHERN RHODESIA: J. C. F. Hopkins s.n. [Govt. Herb. Salisbury 7727] (F--photo, N, N--photo, Rh, Sg--photo, Z--photo); Rattray 996 [Govt. Herb. Salisbury 19303] (Rh).

ERIOCAULON MEGAPOTAMICUM Malme

Literature references: Malme, Phanerogamen 3: 8. 1933.

The specimens from Povo Novo and from Pelotas, cited in literature, are both from Rio Grande do Sul, Brazil.

ERIOCAULON MEIKLEI Moldenke

Additional citations: SENEGAL: Monod 3 (An--isotype, F--photo of type, N--fragment of type, N--photo of type, P--type, Sg--photo of type, Z--photo of type).

ERIOCAULON MELANOCEPHALUM Kunth

The Killip specimen referred to by me under E. melanocephalum var. longipes Griseb. in my first installment of these Notes has now been seen by me and is cited below as typical E. melanocephalum. Genuine South American material has now been available to me and seems to be identical with the Cuban material, although the León & Alain specimen, cited below, surely is very similar to the so-called E. lacustre Ruhl. If the latter is really a valid species, my friend Killip may be correct in his contention that the Cuban material is distinct from the continental American material. The former would then be E. lacustre and the latter E. melanocephalum. Pennell found E. melanocephalum in streams in a llano at an altitude of 450 m. in Colombia and describes it as an aquatic herb with black or grayish-black inflorescences in September.

Additional citations: CUBA: Pinar del Río: Killip 32380 (N); León & Alain 19431, in part (Ha, N). Province undetermined: C. Wright 3240 (Pa). COLOMBIA: Méta: Pennell 1635 (N), 1637 (N).

VENEZUELA: Bolívar: Steyermark 59256 (F--1209390, N). FRENCH GUIANA: Collector undesignated s.n. [Cayenne, 1844] (Du). BRAZIL: Amazonas: Ule 8088 (N, W--1615041).

ERIOCAULON MELANOLEPIS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 4406 [Herb. Jard. Bot. Belo Horiz. 17496] (N).

ERIOCAULON MERRILLII Ruhl.

Literature references: E. D. Merr., Chron. Bot. 10: 210. 1946.

The species has been collected in anthesis in April, September, October, and December.

Additional citations: FRENCH INDOCHINA: Tonkin: Poilane 8059 (N), 8064 (N), 8090 (N), 8099 (N). PHILIPPINE ISLANDS: Luzon: M. Ramos s.n. [Herb. Philipp. Bur. Sci. 5544] (N); R. S. Williams 946 (N, N), 1004 (N). Mindanao: E. B. Copeland 1431 (N). Sibuyan: Elmer 12248 (Vt).

ERIOCAULON MESANTHEMOIDES Ruhl.

My friend, E. Milne-Redhead, in a letter to me dated July 8, 1947, says "We have not got the type of E. mesanthemoides, but I have selected a specimen from the type locality which is probably that species. I consider it to be conspecific with E. schimperi. I would refer you also to a specimen in the Arnold Arboretum collected by Linder (no. 2397) on Mt. Mikeno in the Virunga group [Ruanda & Urundi] and named E. volkensis Engl. var. mildbraedii Ruhl. Our sheet of it has been referred to E. mesanthemoides." The Stolz collection cited below has the habit of E. Schimperi, but its involucreal bractlets are perhaps different and the leaf-tips not so narrowed-cucullate as in that species; the third peduncle on this specimen is exerted 2 1/2 inches from the sheath. It was collected at an altitude of 1300 m.

Additional citations: BRITISH NYASALAND PROTECTORATE: Stolz 2098 (E--392181, N).

ERIOCAULON MEXICANUM Moldenke

Additional citations: MEXICO: Jalisco: Pringle 11202 (Cm--isotype).

ERIOCAULON MICROCEPHALUM H.B.K.

Literature references: F. L. Herrera, Sinops. Flora Cuzco 1: 170. 1941; R. Espinosa, Estud. Bot. Sur Ecuad. 1: 73. 1948; R. Espinosa, Estud. Bot Sur Ecuad. 2: 25. 1949.

The André K.1737 cited by me in the first installment of these Notes as from an undetermined province in Ecuador is actually from Loja, Ecuador. Herrera, in the reference cited above, records the species from Paso de Tres Cruces, alt. 3800 m., Cuzco, and cites Pennell 13864, saying that the species is found in Mexico, Ecuador, and Peru (departments of Junín and Cajamarca). The species has been found in bogs, wet meadows, gravelly soil around mountain springs, forming dense cushions of narrow grass-like leaves 1 inch long or less in bogs in sunny exposures, and forming cushions in wet areas, at altitudes of 7500 to 11,500 feet. Bells describes it as having tufted habit, with stems to 1 or 1 1/4 inches tall, silvery leaves, and silver-gray round heads of flowers. Penland and Summers describe the leaves as bright medium-green and the heads black, the roots deep-seated. Espinosa says "pequeñas rosetitas que forman almohadillas en lugares húmedos y pantan-

os del páramo". It has been collected in anthesis also in June and September. It has been mixed on the same sheet with E. Ehrenbergianum.

Additional citations: MEXICO: Federal District: Reiche s.n. [Herb. Inst. Biol. Univ. Nac. Mex. 2607] (Me). México: Balls 5041 (W--1793754); Pringle 6144 (Br, Cm, D--824272, Me, Me, Me, Vt), 7361 (Me); Reiche s.n. [Herb. Inst. Biol. Univ. Mex. 2606] (Me); J. G. Schaffner 226, in part (Cm). Tamaulipas: Harshberger 50 (D--824263). Veracruz: Balls 5495 (W--1793858). ECUADOR: Azuay: W. H. Camp E.465 (N), E.2086 (N), E.2582 (N). Carchi: Penland & Summers 903 (N). Loja: R. Espinosa 1403 (N), 2184 (N). Pichincha: W. H. Camp E.1681 (N). Province undetermined: Spruce 5862 (K).

ERIOCAULON MINUTUM Hook. f.

The species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a therophyte.

ERIOCAULON MIQUELLANUM Körn.

This species was originally described by Körnicke in Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 162 on the basis of a specimen collected by Buerger.

ERIOCAULON MISERRIMUM Ruhl.

Additional citations: ISLA DE PINOS: Carabia 1081 (Cr, N).

ERIOCAULON MISERUM Körn.

Additional citations: INDIA: Assam: C. B. Clarke 42963 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON MISSIONUM Castell.

Literature references: Castellanos in Descole, Gen. Sp. Pl. Argent. Eriocaul. 88. 1945.

ERIOCAULON MITOPHYLLUM Hook. f.

Additional citations: PAKISTAN: East Bengal: W. Griffith 5578 (F--photo of type, K--type, N--isotype, N--photo of type, Sg--photo of type, Z--photo of type).

ERIOCAULON MODESTUM Kunth

My good friend, Dr. W. G. Herter, of Montevideo, is of the opinion that his no. 2110 [Herb. Herter 99864], a plant 1--2.5 dm. tall, with white flowers, collected on December 7, 1947, at Parque Plata, at an altitude of 3--4 m., dept. Canelones, represents the type collection of a new Uruguayan species which he has done me the honor of naming E. Moldenkei and which he says differs from E. modestum in having much more num-

erous roots which are filiform, scarcely 0.5 mm. in diameter, and twisted, and leaves that are narrowly linear-lanceolate, subrigid, acuminate, shiny, scarcely fenestrate, 2--2.5 cm. long, 2 mm. wide at the base. In E. modestum he says the roots are fewer in number, 1 mm. in diameter, and the leaves subtriangular, not shiny, 4--5 cm. long, 5--8 [mostly 6--8] mm. wide at the base, and very distinctly fenestrate. Unfortunately, after comparing a number of separate Uruguayan collections with undoubted E. modestum from Brazil, I am not yet convinced that the two plants are specifically distinct. For the time being, at least, I am calling all of them E. modestum. Rosen-gurtt has collected the Uruguayan plant in swamps (where he says it is frequent) at Arroyo Sarandi along the Río La Plata near Costa Azul in February 1942, and in wet sand (where he says it is also common) at Baffados de Olmos in March 1937 -- both localities being in dept. Canelones. Castellanos collected it in December 1946 at Playa Atlántida, also in Canelones.

Additional citations: BRAZIL: Mattogrosso: M. A. Chase 11802 (W--1495701). Minas Geraes: P. Clausen 63 (N), s.n. [Minas Geraes, 1845] (N, N); Miranda Ribeiro s.n. [Herb. Mus. Nac. Rio Janeiro 47750] (Ja); L. Netto s.n. [Herb. Rio de Janeiro 49129] (Ja); Widgren 821 (W--936270). Rio Grande do Sul: J. Vidal s.n. [Herb. Rio de Janeiro 36737] (Ja). URUGUAY: Castellanos s.n. [Herb. Inst. Miguel Lillo 15182] (N); Herter 2110 [Herb. Herter 99864] (N); Rosengurtt B.1213 (N), B.3900 (N).

ERIOCAULON MODESTUM f. RIGIDIFOLIUM Herzog

This form is recorded as "fa. rigidifolia" from Rio das Femeas, Goyaz, by Herzog in Luetzelburg, Estud. Bot. do Nordeste 3: 147 (1923) and as "rigidifolium" on p. 150 of the same work, and is said to be typical of the Brejo.

ERIOCAULON MODESTUM f. VIVIPARUM Herzog

This form is recorded (as "f. vivipara") from Rio Preto, Bahia, by Herzog in Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923), and is said to be typical of the Brejo.

ERIOCAULON MONODII Moldenke

Additional citations: SENEGAL: Monod 1 (An--isotype, N--type).

ERIOCAULON MUTATUM N. E. Br.

Additional citations: SOUTHERN RHODESIA: Allen & Kobbs 744 (Rh), s.n. [Govt. Herb. Salisbury 744] (Rh); Brain 4486 [Govt. Herb. Salisbury 10738] (F--photo, N--photo, Rh, Sg--photo, Z--photo); Corby 80 [Govt. Herb. Salisbury 20933] (Rh), 134 [Govt. Herb. Salisbury 21587] (Rh); F. Eyles 5759 (Rh); Gilliland 86 (Rh).

ERIOCAULON NEPALENSE Prescott

This species has been confused in the past with E. quinquantulare L. and E. luzulaefolium Mart. It has been collected at an altitude of 7500 feet, in flower and fruit in October. R. R. Stewart notes on the Stocks & Law specimen cited below that the receptacles are glabrous.

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Mont. Khasia] (M). Bombay: Lesz 566 [Blatter Herb. 8388] (Xa); Stocks, Law, etc. s.n. [Malabar, &c.] (C). Madras: Saulière 71 (N). Punjab: Koelz 3032 (W--1607163), 10237 (N).

ERIOCAULON NILAGIRENSE Steud.

The species is recorded (as E. Brownianum var. nilagirensis Fyson) from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a geophyte.

Additional citations: INDIA: Madras: Benbower 429 (Ob--17383); G. S. Gough s.n. (W--297368); Hohenacker 953 (W--45282). State undetermined: R. Wight 2859 (K).

ERIOCAULON NIPPONICUM Maxim.

This species has been confused in the past with E. Sieboldianum Steud., E. sikokianum Maxim., E. cinereum R. Br., and E. truncatum Hamilt. It has been collected in anthesis in August and October. Recorded common names are "itoinanohige" and "shiro-inunohige".

Additional citations: U.S.S.R.: Burrato-Mongolskaya: Bohnhof 309 (N). CHINA: Kwangtung: W. T. Tsang 21681b (Ms). Province undetermined: E. Faber s.n. (N). JAPAN: Hondo: Ohwi s.n. [Mizoro, 26.X.1930] (Ms). Honshiu: Baker & Baker s.n. [Aug. 7, 1914] (Gg--105746), s.n. [9-2-14] (Gg--105745); Y. Matsumura 6215 (N); Yushun s.n. (N). Island undetermined: Herb. State Coll. Wash. 51148 (Pl).

ERIOCAULON ODORATUM Dalz.

The species has been recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a therophyte.

Additional citations: INDIA: State undetermined: Stocks s.n. (K). FRENCH INDOCHINA: Cambodia: Poilane 13904 (N), 13921 (N). Laos: Poilane 16171 (N).

ERIOCAULON OLIVERI Fyson

This species is known thus far only from the Pulney Hills of Madras, India.

ERIOCAULON ORYZETORUM Mart.

The Philadelphia specimen cited below has a wrong label on it. reading "6071" and is mis-identified as E. luzulaefolium

Mart.

Additional citations: NEPAL: Wallich 6069 (D-824256, in part--isotype, M--isotype). FRENCH INDOCHINA: Tonkin: Poilane 8087 (N).

ERIOCAULON OVOIDEUM Britton & Small

Literature references: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47, 105, & 114. 1946.

On page 47 of the reference cited above the specific name is mis-spelled "ovoideum" and it is stated that the species is restricted to the Sabana de los Indios, growing in white siliceous sand of the savannas. It blooms in February.

Additional citations: ISLA DE PINOS: León 17496 (N), 17511 (N); León & Seifriz 17496 (Ha).

ERIOCAULON PACHYPETALUM Hayata

The species is said to be an erect herb rare in rice terraces and retaining walls, blooming in December. It has been confused with E. sexangulare L. and E. cristatum Mart.

Additional citations: CHINA: Kwangtung: S. K. Lau 708 (N). Province undetermined: E. Faber s.n. (N). HAINAN ISLAND: W. T. Tsang 535 [Herb. Lingnan Univ. 16034] (N).

ERIOCAULON PANAMENSE Moldenke

The species has been collected at altitudes of from 1200 to 1500 m., blooming in March and July.

Additional citations: PANAMA: Chiriquí: Killip 3614 (W--1010409--isotype); Woodson & Schery 744 (N).

ERIOCAULON PARAGUAYENSE Körn.

Literature references: Malme, Phanerogamen 3: 7. 1933.

ERIOCAULON PARANENSE Moldenke

Additional citations: BRAZIL: Paraná: Tessmann 2751 [Herb. Mus. Parana. 2751] (N--type), 3720 [Herb. Mus. Parana. 3720] (N).

ERIOCAULON PARKERI B. L. Robinson

Literature references: Fernald, Rhodora 5: 175. 1903; Robinson & Fernald, Gray's Man., ed. 7, 261. 1908; Britton & Br., Illustr. Fl., ed. 2, 1: 454, fig. 1141. 1913; Rhodora 34: 39. 1932; Rhodora 42: 355--416, 419-498, & 503--521. 1940; Rhodora 43: 208--211. 1941; Rouleau, Inst. Bot. Univ. Montréal Contrib. 54: 179, 191, & 313. 1944; Tatnall, Fl. Del. 75. 1947; Ogden, Steinmetz, & Hyland, Bull. Josselyn Bot. Soc. 8: 20. 1948.

Ogden, Steinmetz, and Hyland in the reference cited above record this species from Cumberland, Hancock, Kennebec, Lincoln, Penobscot, and Sagadahoc Counties, Maine. Some specimens appear to be intermediate between this species and E. septangu-

lare With. Among such, all annotated by me as E. Parkeri, are Britton 24 from Sussex Co., Delaware, Carter s.n. from Gunpowder, Maryland, Fassett 157 from Sagadahoc Co., Maine, and Carter s.n. from Wicomico Co., Maryland; and, annotated by me as E. septangulare, Barnhart 1176 from Orange Co., New York, Canby s.n. from Wicomico Co., Maryland, and G. W. Wright s.n. and Herb. Columbia Univ. s.n. without locality of collection designated. Possibly these and the several other similar specimens mentioned below represent hybrids between the two species. Interspecific hybrids in the genus have been described from Japan. In this connection Dr. Fernald's new key for the differentiation of the two species given in *Rhodora* 43: 211 (1941) is of more than passing interest. The Blake 10964 collection made on mud flats of the Weweantic River, is apparently a mixture of both E. Parkeri and E. septangulare, apparently indicating that the two species sometimes grow together. The Herb. Torrey Bot. Club s.n. from Hanover, Massachusetts, also comprises both species. The Canby s.n. from Virginia, not only is a mixture but the part annotated as E. Parkeri is the intermediate pubescent form of the species. The A. P. Garber s.n. from the Mogothy River in Maryland is a similar mixture and the part annotated as E. Parkeri is only slightly less hairy than the part that is undoubtedly E. septangulare. Proctor 3095 from Dorchester Co., Maryland, is also the white-hairy form, while Proctor 3096 from Caroline Co. is the typical form. Pennell 2587 from Fairfax Co., Virginia, is also the white-hairy form, as are Rousseau 22073 and Rouleau 1294 from Quebec and both Rolland-Germain 82 and s.n. from Ontario.

The species, which was named in honor of Charles F. Parker of Philadelphia, has been collected almost uniformly in tidal mud flats submerged at high tide, labels reading tidal marshes, brackish backwaters, muddy shores, muddy banks, gravelly tidal shores somewhat overlaid with mud, etc. One collection was made under shrubs at muddy tidal margin and one on the muddy bank of a millpond. It has been collected on the sandy shores of the Susquehanna River in Maryland, the banks of the Agawan River in Massachusetts and the Hudson River in New York, the Schuylkill and the Tuquan in Pennsylvania, in anthesis in August and September, in fruit in September. Specimens have been variously identified in herbaria as E. articulatum Morong, E. septangulare With., E. gnaphalodes Michx., and Paepalanthus flavidulus Kunth. The late Marie-Victorin collected it in association with Gentiana Victorinii in Quebec. The K. K. Mackenzie 7344 (H--51971) specimen at Duke University identified as this species is actually Scirpus debilis Pursh. The Heller & Halbach specimen cited below is labeled "The only station in the county" [Lancaster Co., Penna.]. Fernald & Long on the label of

their no. 13166 describe the plant as bright-green. The specific name is sometimes lower-cased.

Additional citations: CANADA: QUEBEC: Bellechasse Co.: Rousseau 22073 (Mb, Vi). Levis Co.: Rouleau 1294 (Mb, Mb). Montmorency Co.: Marie-Victorin, Rolland-Germain, & Meilleur 44387 (Mb). Portneuf Co.: Marie-Victorin, Rolland-Germain, & Jacques 33869 (Mb, Vi). Quebec Co.: Clausen & Trapido 2779 (Ba); Marie-Victorin 28146 (Mb, Vi); Michel s.n. [24 août 1933] (Mb). ONTARIO: Ottawa Co.: Rolland-Germain 82 [Herb. Marie-Victorin 13311] (Vi), s.n. [Herb. Marie-Victorin 3917] (Vi). ALABAMA: Penobscot Co.: Fernald & Long 13166 (Al, Vi). Sagadahoc Co.: Fassett 4271 (H--65759); Fernald & Long s.n. [Plant. Exsicc. Gray. 174] (Al, Au, Ba, Cm, Du--30363, Gg--105754, H, Pl--62441, We); A. H. Norton s.n. [August 12, 1923] (Se--3967). VERMONT: Franklin Co.: Muenschler, Manning, & Maguire 313 (Ba). MASSACHUSETTS: Plymouth Co.: Bacigalupi 2078 (Du--209009); S. F. Blake 10964, in part (Au, Gg--171090, Mb, Po--196391, in part); Herb. Torrey Bot. Club s.n. [Hanover, Mass.] (Tc). CONNECTICUT: Fairfield Co.: E. H. Eames 9474 (Al). NEW YORK: Albany Co.: H. D. House 24275 (Al). Columbia Co.: McVaugh 2958 (Al), 3807 (Al), 4459 (Al), 4469 (Al); Muenschler & Curtis 5600 (Al). Greene Co.: H. D. House 25128 (Al), 25193 (Al). Orange Co.: Muenschler & Curtis 5599 (Al). Rockland Co.: Muenschler & Curtis 5598 (Al). Ulster Co.: H. D. House 25069 (Al, Ba); Muenschler & Curtis 5603 (Al), 5606 (Al), 5606b (Al); Muenschler, Winne, & Isely 20694 (Pl--131938). NEW JERSEY: Burlington Co.: K. K. Mackenzie 5684 (H--52212). Camden Co.: Martindale s.n. [Camden, July 1875] (Je--207); C. F. Parker s.n. [Herb. Ill. Ind. Univ. 18384] (Ur); F. W. Pennell 12006 (Cm, Mb, N). Monmouth Co.: Edwards & Clausen 1419 (Ba); Gershoy 207 (Ob--61422). Ocean Co.: Clausen & Wilson 2345 (Ba). PENNSYLVANIA: Bucks Co.: Dreisbach 4394 (Cm), 4541 (Cm). Lancaster Co.: Heller & Halbach s.n. [mouth of the Tucquan, Sept. 12, 1891] (Ur). Philadelphia Co.: E. Durand s.n. [banks of the Schuylkill River, Philad.] (Po--186031). County undetermined: C. F. Parker s.n. [shore of the Delaware above Richmond, Pa., Sept. 18, '64] (Pr). DELAWARE: New Castle Co.: Tatnall & Commons s.n. [river shore below Hollyoak, 8.17.1896] (Cc). Sussex Co.: S. Brown s.n. [Sept. 21, 1907] (D--530232); Collector undesignated s.n. [Milford, 9/1/1892] (Cc); Leeds 2946 (D--740729); Van Pelt & Long s.n. [Milford, July 21, 1908] (D--533131). MARYLAND: Caroline Co.: Proctor 3096 (D--324252). Cecil Co.: S. F. Blake 9694 (Or--21268). Dorchester Co.: Proctor 3095 (D--324251). Harford Co.: C. S. Williamson s.n. [Havre de Grace, Sep. 1st 1906] (D--532920). Wicomico Co.: F. Brendel s.n. [Salisbury, Aug. 26, '67] (Ur); J. J. Carter s.n. [Salisbury, July 15, 1904] (D--

527397); Wherry & Pennell 12858 (D--728103). County undetermined: A. P. Garber s.n. [Mogothy River, Aug. '67] (D--568220, in part). DISTRICT OF COLUMBIA: C. T. Mohr s.n. [Sept. 14, 1882] (Du--90821); E. S. Steele s.n. [July 31, 1896] (Ob--23908), s.n. [August 28, 1896] (H--22971, Ob--23908). VIRGINIA: Arlington or Alexandria City County: Steele s.n. [Herb. Marie-Victorin 15518] (Vi). Charles City Co.: Fernald & Long 11282 (Ba). Fairfax Co.: F. W. Pennell 2587 (D--582116). James City Co.: Fernald & Long 10988 (Gg--289418, N). Nansemond Co.: Fernald & Long 11283 (H--66458). County undetermined: Canby s.n. (Du--11077, in part). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Hapeman s.n. (St--3292).

ERIOCAULON PERPLEXUM Satake & Hara

Literature references: Satake & Hara, Bot. Mag. Tokyo 52: 400--401. 1938.

The above reference is the original publication of this binomial, proposed for the "Eriocaulon nipponicum" of Tatew., Veg. Apoi 119 & 131 (1928), of Nakai, Veg. Apoi 76 (1930), and of Miyabe & Kudo, Fl. Hokk. & Saghal. 3: 286 (1932). Hara s.n. [Aug. 26, 1933] is given as the type, and the common name of "yezo-inunohige" is recorded. The species is found in marshy places at the foot of Mt. Apoi. In appearance it is said to resemble E. nipponicum Maxim. and E. decemflorum Maxim., but differs from these by having connate sepals and longer styles and by the fact that dimerous and trimerous flowers are thoroughly mixed in each head.

ERIOCAULON PINARENSE Ruhl.

Additional citations: CUBA: Pinar del Río: Ekman 18769 (N--photo of type).

ERIOCAULON PLUMALE N. E. Br.

Additional citations: FRENCH GUINEA: Schnell 2154 (An, F--photo, N, N--photo, Sg--photo, Z--photo), 2195 (An).

ERIOCAULON POILANEI Moldenke

Citations: FRENCH INDOCHINA: Annam: Poilane 5600 (N--type).

ERIOCAULON POLYCEPHALUM Hook. f.

This species is recorded (as "E. longicuspis var. polycephala Fyson") from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a geophyte. The mis-spelling "E. longicuspus var. polycephala Fyson" occurs in herbaria. The species has been collected at 6000 feet elevation.

Additional citations: INDIA: Central Provinces: Duthie 10581 (K, N). Madras: E. Barnes B.12 (F--photo, K, N, N--photo,

Sg--photo, Z--photo); J. S. Gamble 12134 (K).

ERIOCAULON POROSUM Lesq.

Literature references: U. S. Geol. Surv. Ann. Rept. 1873: 396. 1874; Rep. U. S. Geol. Surv. Terr. 7: 106, pl. 16, figs. 2 & 2a. 1878.

This fossil species was described from an Eocene formation at Sand Creek, Denver, Denver Co., Colorado, but the specimen in the New York Botanical Garden fossil collection does not look like an Eriocaulon. Its leaves have too strong a midrib.

ERIOCAULON PRINGLEI S. Wats.

This species was based on Pringle 1533 from the base of the Sierra Madre Mountains in Chihuahua, Mexico, collected in September 1887. The Philadelphia specimen of Pringle 2018 is erroneously marked "isotype". The species is found in wet places on plains.

Additional citations: MEXICO: Chihuahua: Pringle 2018 (Br, Cc, Cm, D--824254, Es, Me, Pa, Vt).

ERIOCAULON PSEUDOCOMPRESSUM Ruhl.

The species has been confused with E. compressum Lam. It has been collected in anthesis in January. The León, Victorin, & Alain 19629, cited below, represents the terrestrial form of the species, while their no. 19630 represents the aquatic form.

Additional citations: CUBA: Pinar del Río: Acuffa 10696 (Es), 10708 (Es), 14962 (Es); León & Alain 19629 (Ha); León, Victorin, & Alain 19629 (N), 19630 (N); Moldenke & Moldenke 19876 (Es, Lg, N), 19921 (Es, Lg, N); Moldenke, Moldenke, León, Alain, & Acuffa 15262 (Es); C. Wright 3741 (Pa--isotype).

ERIOCAULON PTEROSEPALUM Herzog

Additional citations: BRAZIL: Amazonas: Luetzelburg 21052 [Herb. Mus. Nac. Rio Janeiro 47705] (Ja--cotype, N--cotype), 21053 [Herb. Mus. Nac. Rio Janeiro 47704] (Ja--cotype, N--cotype), 21056 [Herb. Mus. Nac. Rio Janeiro 47706] (Ja, N).

ERIOCAULON PTEROSPERMUM Hayata

Synonymy: Eriocaulon petrospermum Hayata ex Moldenke, Known Geogr. Distrib. Erioc. 25 & 38, sphalm. 1946.

Additional citations: FORMOOSA: Odashima 13575 (D--752408).

ERIOCAULON QUINQUANGULARE L.

The species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a therophyte. The R. Wight 2367 collection, cited below, is one of the cotypes of E. argenteum Mart.

Additional citations: PAKISTAN: East Bengal: W. Griffith

5585 (C). Northwest Provinces: Gammie 18734 (K). INDIA: Chota Nagpur: C. B. Clarke 20810 (K), 34351 (K). Province undetermined: C. B. Clarke 33787 (K); Haines 3596 [North Chanda] (K); Royle s.n. [Himalayas] (D--824286); R. Wight 2367 (M, N).

ERIOCAULON RAVENELII Champl.

Literature references: Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944.

The species has been confused in herbaria was the genus Lachnocaulon, especially L. glabrum Körn., and the mis-spellings "E. Ravenelli", "E. Ravenellii", and "E. Ravinelii" occur. The species is found on prairies, in hammocks, and in low pine-lands, and has been collected in anthesis in November. The C. E. Smith 142 specimen cited below is marked "TYPE", apparently erroneously. The two Buswell specimens cited below are extremely immature.

Additional citations: SOUTH CAROLINA: Berkeley Co.: Ravenel s.n. [Santee Canal] (Cc, Pr). County undetermined: Ravenel s.n. [S. Car.] (Pa). FLORIDA: Dade Co.: Small & Carter 121 (D--570845), 654 (D--526717), 888 (Ur), 1148 (D--568223), s.n. [Jany. 14, 1907] (D--568224), s.n. [south of Cutler, January 14, 1909] (Bu, Fl--23551, H--51299). Gilchrist Co.: West & Arnold s.n. [Trenton, 5 Oct. 1940] (N). Hillsborough Co.: A.P. Garber s.n. [Tampa, Sept. 1877] (D--824239, in part, Pa, Vt). Lee Co.: Buswell s.n. [Sept. 1929] (Bu), s.n. [April 1930] (Bu); M. F. Baker s.n. [Alva, Nov. 30, 1917] (Fl--495); H. C. Beardslee s.n. [Nov. 10, 1917] (Ob--94489). Levy Co.: A. P. Garber s.n. [Nov. 1877] (Pa). Okeechobee Co.: Small, Britton, Britton, & DeWinkeler 9269 (N). County undetermined: A. W. Chapman s.n. [S. Florida] (Pa); C. E. Smith 142 (D--824253).

ERIOCAULON REGNELLII Moldenke

Additional citations: BRAZIL: Minas Geraes: Regnell III.1740 (F--photo of type, N--fragment of type, N--photo of type, W--937199--type, Z--photo of type).

ERIOCAULON RITCHIEANUM Ruhl.

The species is recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a therophyte.

Additional citations: INDIA: Madras: J. S. Gamble 20985 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON ROBINSONII Moldenke

The species inhabits damp places on dunes.

Additional citations: FRENCH INDOCHINA: Arnam: Clemens & Clemens 3275 (D--656797, Gg--156735, N); Consigny A.244 (N);

C. E. Robinson 1043 (It--isotype, N--type).ERIOCAULON ROBUSTIUS (Maxim.) Mak.

Literature references: Steinberg, Fl. URSS 3: 497. 1935;
Hara, Bot. Mag. Tokyo 52: 401. 1938.

Synonyms: Eriocaulon robustium Makino, Journ. Jap. Bot. 3 (7): 26. 1926. Eriocaulon alpestre β robustius Maxim. ex Mak., Bot. Mag. Tokyo 4: 174, nom. nud. 1890; Maxim., Diagn. Pl. Nov. Asia 8: 25. 1893; Matsumura, Ind. Pl. Jap. 2 (1): 175. 1905; Nakai, Bot. Mag. Tokyo 25: [220], fig. C. 1911.

The species has been found in marshy places, blooming in September, and a common name is "hiroha-inunohige". Hara records the species from Kyushu, Shikoku, Honshu, Yezo, Korea, Manchuria, and Ussuri. He says the smallest individual he has observed was only 2 cm. tall.

Additional citations: JAPAN: Musashi: Herb. Sci. Coll. Imp. Univ. s.n. [Oct.] (Vt).

ERIOCAULON ROBUSTO-BROWNIANUM Ruhl.

The species has been recorded from Mysore, India, by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a geophyte.

Additional citations: BURLIA: Tenasserim: W. Griffith 5571 (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON ROBUSTUM Steud.

Additional citations: INDIA: Madras: Gardner s.n. (F--photo, K, N--photo, Sg--photo, Z--photo); Hohenacker 1307, in part (F--photo, K, N--photo, Sg--photo, Z--photo); Hooker f. & Thomson s.n. (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON ROCKII Moldenke

Citations: CHINA: Yunnan: J. F. C. Rock 10343 (N--type).

ERIOCAULON SANTAPAU Moldenke

Additional citations: INDIA: Bombay: Santapau & McCann 1290 (N--type, Xa--isotype). State undetermined: Kuntze s.n. [1875] (N).

ERIOCAULON SCARIOSUM J. Sm.

Synonymy: Eriocaulon Smithii R. Br., Prodr. 1: 254. 1810.

The species is said to be common in ditches along roadsides, by rivulets, the margins of streams, and in open scrub. The Betche specimen cited below has very black heads.

Additional citations: AUSTRALIA: New South Wales: T. A. Stephenson s.n. (M). Queensland: Betche s.n. [Atherton, 3.1901] (D--518031, N); M. K. Clemens s.n. [Sunnybank, Aug. 5, '43] (Or--49422); J. Shirley s.n. [near Brisbane] (N); C. T. White

7167 (H). State undetermined: Terrace 3245 (Gg--105731). BRIBIE ISLAND: M. K. Clemens s.n. [Apr. 20--30, 1944] (Or--49073, Or--49674). DOUBLE ISLAND: M. K. Clemens s.n. [October 16, 1946] (Or--55929).

ERIOCAULON SCHIEDEANUM Körn.

The species has been collected in wet hollows of rocky slopes at an altitude of 5000 feet, blooming in October. The specific name is often lower-cased. It is often distributed as E. Jaliscanum Watson.

Additional citations: MEXICO: Jalisco: Pringle 6146 [Herb. Inst. Biol. Univ. Nac. Mex. 2603] (Cc, Cm, D--824273, Gg--162420, Me, Me, Po--185874, Vt), s.n. [near Guadalajara, 5 Nov. 1889] (Vt), s.n. [near Guadalajara, Oct. 7, 1891] (Vt).

ERIOCAULON SCHIMPERI Körn.

Synonymy: Eriocaulon congensense Moldenke, *Phytologia* 2: 218--219. 1947.

My friend, E. Milne-Redhead, in a letter to me dated 8 July 1947 says: "We have not got the type of E. mesanthemoides, but I have selected a specimen from the type locality which is probably that species. I consider it to be conspecific with E. schimperii. I would refer you also to a specimen in the Arnold Arboretum collected by Linder (no. 2397) on Mt. Mikeno in the Virunga group [Ruanda & Urundi] and named E. volkensii Engl. var. mildbraedii Ruhl. Our sheet of it has been referred to E. mesanthemoides. I send also a gathering from Behungi Swamp, Virunga Mts., one from Njombe in S. Tanganyika, and one from Nyasaland. Superficially all these seem to be very similar to Schimper 1217, the type of E. schimperii Koern. ex Engl. which is also included." The Chapin 404 collection cited below is the type of E. congensense. The species has been collected in marshes among grassland on mountain summits at elevations of from 7250 to 8200 feet, blooming in March. The Lynes specimen cited below has 3 peduncles, each with binary heads.

Additional citations: ABYSSINIA: Schimper 1217 (F--photo of type, K--type, N--fragment of type, N--photo of type, W--945562 --isotype, Z--photo of type). BELGIAN CONGO: Chapin 404 (N). RUANDA & URUNDI: Burt 2922 (K, N); D. H. Linder 2397 (G). TANGANYIKA TERRITORY: E. M. Bruce 723 (Br, K, N); Lynes 70 (K, N). BRITISH NYASALAND PROTECTORATE: Brass 17232 (N, N); McClounie 29 (K, N).

ERIOCAULON SCHIMPERI var. GIGAS Moldenke

Additional citations: KENYA: I. R. Dale 3397 (Br--type, F--photo of type, N--fragment of type, N--photo of type, Z--photo of type).



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OBSERVATIONS ON TROPICAL AMERICAN MELASTOMES

H. A. Gleason

Leandra subulata sp. nov. An Sect. Secundiflorae. Frutex epiphyticus densissime strigosis. Folia parva petiolata ovata, inter venas sparsissime strigosa; flores 4-meri breviter pedicellati in cymis 3-floris terminalibus. Hypanthium obconicum; sepala brevia triangularia, dentibus exterioribus subulatis elongatis.

A branching leafy shrub as much as 1.8 m. tall; younger branches, petioles, pedicels, hypanthia, calyces, and veins of the leaves very densely strigose with spinulose-subulate, closely appressed, pale brown hairs about 3 mm. long. Leaves long-petioled, the blades ovate, 1.5--3.5 cm. long, 1--2 cm. wide, sharply acute or subacuminate, entire, ciliate, rounded at the base, 5-nerved or 7-plied-nerved, sparsely strigose on both sides between the veins. Flowers 4-merous, in terminal 3-flowered cymes, short-pedicel. Hypanthium obconic, 3 mm. long. Calyx-tube prolonged about 0.4 mm., the sinuses broadly rounded; sepals very thin, about 1 mm. long from the torus, triangular; exterior teeth erect, subulate, 5--6 mm. long. Petals pink, ovate, 4.2 mm. long, sharply acute. Stamens isomorphic; filaments flat, 2.5 mm. long, slightly widened distally, and at the summit abruptly narrowed; anthers oblong, obtuse, thick, 2 mm. long, 4-celled; connective elevated into a dorsal ridge and prolonged into a minute dorsal spur. Ovary inferior, apparently 3-celled; style straight, glabrous, 4.5 mm. long; stigma capitellate.

Type Allen 4804, collected on northern slopes of Cerro Horqueta, altitude 1800--2100 meters, in Bocas del Toro Province, Panama and deposited in the herbarium of the New York Botanical Garden. The plant was described by the collector as an epiphyte in the top of giant trees, a habit previously unknown to me in this genus.

Leandra strigosa sp. nov. Sect. Secundiflorae. A species hujus sectionis adhuc descriptis differt pubescentia strigosa atque in hypanthio partim glandulosa, foliis 5-nerviis nec pli-nerviis.

Shrub 2 m. tall. Stems and petioles very densely strigose. Petioles 1--3 cm. long. Leaf-blades ovate-lanceolate or ovate, up to 15 cm. long and 10 cm. wide, long-acuminate, densely ciliate, denticulate, rounded at base, 5-nerved with an additional pair of marginal nerves, densely pubescent on both sides with spreading hairs 0.5--1 mm. long and strigose on the primary nerves. Inflorescence paniculate, 6--20 cm. long, the branches opposite, diverging at right angles, very

densely strigose. Flowers 5-merous, sessile and secund. Hypanthium deeply cup-shaped, about 2.2 mm. long to the torus, densely strigose with curved-ascending hairs increasing from 0.7 mm. long at the base to 1.7 mm. at the summit, and often gland-tipped. Calyx-tube prolonged about 0.25 mm. to rounded sinuses; sepals 0.8 mm. long from the torus, triangular-acuminate with concave sides; exterior teeth lacking. Petals narrowly triangular, 2.3 mm. long, gradually tapering to the tip. Stamens isomorphic, erect; filaments slender, glabrous, nearly straight, 2.8 mm. long; anthers oblong, straight, obtuse, 1-1.2 mm. long; connective completely simple. Ovary wholly inferior, 5-celled.

Type, Woodson, Allen and Seibert 415, collected between Río Tinta and Río Tabasará, Province of Chiriquí, Panama, in the herbarium of the Missouri Botanical Garden. I refer here also Allen 3672, from the Province of Colón, Panama, Archer 2073, from the Choco region of Colombia, and an old collection by Triana, also from Choco, and labeled in his own hand Clidemia sulcicaulis Poepp. L. strigosa has been placed in herbaria under L. dichotoma (D. Don) Cogn., which it closely resembles in habit and foliage. It is separated by its pubescence, which is distinctly strigose, and on the hypanthium often also glandular, while the hypanthial hairs of L. dichotoma are never glandular and those of the stem are retrorse at base or throughout their length.

Acisanthera uniflora comb. nov. (Rhexia uniflora Vahl, Symb. 2: 48. 1791; Rhexia recurva L. C. Rich. Act. Soc. Nat. Hist. Paris 1792: 108. 1792; Acisanthera recurva, of Cogn. Monog. and most subsequent literature.)

Loreya brunnescens comb. nov. (Henriettea brunnescens Standley, Field Mus. Publ. Bot. 4: 247. 1929.)

Having before him a plant without flowers, Standley referred it very naturally to the North American genus which it most closely resembled. Nevertheless, the type plant has all the aspect of the South American genus Loreya, hitherto unknown in North America, with leaves broadest near the middle, very strongly 5-pleinerved, and simple hairs on all its parts. I transfer Standley's plant accordingly.

Clidemia densiflora comb. nov. (Henriettea densiflora Standley, Field Mus. Publ. Bot. 4: 247. 1929.)

Material recently received of this odd plant shows that the petals are distinctly obtuse and lack the cucullate apex so characteristic of both Henriettea and Ossaea.

Calyptrella micrantha sp. nov. Frutex subglaber, caulibus junioribus, paginis inferioribus at hypanthis minutis-

sime punctatis; folia elliptica graciliter petiolata, ad basin imam biappendiculata; flores 5-meri pedicellati in panicula multiflora; calyx in alabastro acuminatus falcatus, mox ad torum deciduus; petala lanceolata acuminata; stamina isomorpha; antherae lanceolatae; connectivum infra thecas breviter productum in calcar minutum dorsalem.

Shrub to 5 m. tall, the younger stems, petioles, lower leaf-surface and hypanthia dotted with minute hyaline atoms. Petioles slender, 3--5 cm. long. Leaf-blades elliptic, thin, up to 20 cm. long, two-fifths to half as wide, abruptly caudate-acuminate, entire, obtuse at base, and appendiculate on each side of the petiole, glabrous above, 3-nerved with an additional pair of marginal veins; secondary veins 6--8 mm. apart, diverging at an angle of about 70°. Peduncle terminal, 2--4 cm. long, erect; panicle many-flowered, up to 9 cm. long, the slender branchlets terminating in cymes of 3--5 5-merous flowers on slender pedicels 3--5 mm. long. Hypanthium cup-shaped, 2 mm. long. Calyx acuminately conic in bud, often falcate, 3 mm. long; exterior teeth minute, tuberculiform. Petals white, narrowly lanceolate, long-acuminate, 3 mm. long. Stamens isomorphic; anthers lanceolate, the thecae 2.6 mm. long, the connective prolonged straight back 0.9 mm. and acute at the tip. Ovary superior; style elongate; stigma punctiform.

Type, von Wedel 2249, from Fish Creek Mountains, Bocas del Toro Province, Panama; it has been divided into two portions, one with larger panicle and more flowers in the herbarium of the Missouri Botanical Garden, the other with better leaves in the herbarium of the New York Botanical Garden.

Those who have identified, or tried to identify, melastomes from the Venezuelan Andes by the aid of Cogniaux' Monograph have probably been puzzled by seven species, numbered 334 to 340 inclusive, in *Miconia* section *Amblyarrhena*. Since the leaves are strongly 3--5-plei-nerved and the flowers are 4-merous, their position in the Monograph is clearly indicated. The difficulty comes in referring a plant to a particular one of the species. That is often done by comparing it with named herbarium material, which has led to placing most specimens into *M. spinulosa* Naud. and *M. ulmarioides* Naud.

There was little material available to Cogniaux when he wrote the Monograph. He cited only 20 collections, of which thirteen were in the two species mentioned. He could easily have made mistakes.

His chief error was in placing *M. Barbeyana* Cogn. into this group of species. Careful examination of the type specimen in the Boissier Herbarium showed that the flowers are actually 5-merous. If is a Peruvian plant, it differs also

in other ways from the six Venezuelan species, and should be removed to a different place in the classification. Since I have no present access to the two collections of the species known to me (the second a recent collection by Sandeman, now in the Kew Herbarium), I shall not attempt to place it more correctly.

Further study of type material of the other six species convinces me that they should be reduced to four. *M. aegrotans* Naud. and *M. ulmarioides* Naud., originally described on the same page, should be united under the latter name; this name is selected because more specimens are so named in herbaria. *M. spinulosa* Naud. and *M. inaperta* Naud. should also be combined under the former name, which I have selected for the same reason; it has the negligible advantage of fifteen pages of priority as well.

The four Venezuelan species, as I now understand them, may be distinguished without dissection of the flower by the following artificial key:

- Leaves 5-ply-nerved; flowers (at least the laterals) distinctly pediceled; exterior teeth broader than long.
 Leaves abruptly short-acuminate; secondary veins strongly elevated beneath. *M. octoscedidium* Naud.
 Leaves slenderly acuminate; secondary veins often plane beneath. *M. spinulosa* Naud.
 Leaves 5-ply-nerved; flowers sessile or very nearly so; exterior teeth longer than wide (0.8 mm. long).
 Leaves of an oblong type, widest at or near the middle, acute or abruptly short-acuminate. *M. arbutifolia* Naud.
 Leaves of a lanceolate or ovate-lanceolate type, broadest well below the middle and slenderly acuminate. *M. ulmarioides* Naud.

In the mountains of southwestern Colombia a fifth species occurs which is obviously related to the four Venezuelan species discussed above. It has the 5-ply-nerved leaves of the first two in the key, the sessile flowers of the last. It differs from all in its much smaller panicle, and usually also in its strictly entire leaves. The geographical separation is about 500 miles.

Miconia prasinifolia sp. nov. Sect. *Amblyarrhena*. Folia ad basin subsessilem sensim cuneato-angustata, valde 5-ply-nervia, integra; panicula parva pauciflora; flores 4-meri.

Shrub with glabrous stem. Leaves on petioles 0-10 mm. long; blades elliptic, up to 23 cm. long and 9 cm. wide, entire, gradually or more often abruptly narrowed to a slender obtuse point, cuneately narrowed at the base, smooth above, thinly stellate-furfuraceous beneath on the veins and veinlets, strongly 5-ply-nerved, the inner pair of lateral veins

arising 2--5 cm. above the base; veins plane above, beneath prominulous and reticulate, the secondaries 5--10 mm. apart. Panicle, including the short peduncle, 2--6 cm. long, nearly or quite glabrous. Flowers few, sessile, 4-merous. Hypanthium campanulate, glabrous, 2.6 mm. long. Calyx-tube scarcely developed; sepals broadly rounded from subacute sinuses, 0.4 mm. long; exterior teeth firm, appressed, resembling the sepals in shape and size but conspicuously apiculate. Petals ovate-lanceolate, obtuse, white, 3.6 mm. long. Stamens isomorphic; filaments 2 mm. long, the basal three-fourths thick and slightly flattened, the upper fourth sharply bent, slender, terete; anthers semi-ovoid, 1.7 mm. long, opening by a minute terminal pore; connective stout, not prolonged or apeddedged. Ovary half-inferior; style straight, terete, glabrous, 6 mm. long; stigma punctiform.

Type, Killip & Hazen 9011, collected at Río Santa Rita, Salento, Department of Caldas, Colombia, in dense forests at an altitude of 1600--1800 meters, deposited in the herbarium of the New York Botanical Garden. Killip & Smith 10136 was collected at the same place a month later; Lehmann B.T. 1195 from Timbiqui is also identical.

Miconia torta sp. nov. Sect. *Cremanium*. Caules juniores et petioli glanduloso-hirsuti; folia supra glabra, subtus in axillis venarum majorum hirsuta, fere 5-plex-nervia; panicula et hypanthium glabrum.

Shrub 1--1.5 m. tall. Younger branches prominently 4-angled, glandular-hirsute with stiff spreading hairs about 1 mm. long. Leaf-blades elliptic-lanceolate, up to 15 cm. long and 5 cm. wide, subacuminate, gradually narrowed to a rounded base, remotely denticulate with minute, appressed, subulate, callous teeth, obscurely 5-plex-nerved, glabrous on the upper surface, the primaries impressed, secondaries obscure, tertiaries obsolete; lower surface glabrous, the secondaries prominulous, the tertiaries obscure, the three inner primary veins densely hirsute at the very base with simple hairs up to 2 mm. long; many of the secondaries, as far as the middle of the leaf, bearing a few similar hairs close to the primaries. Panicle glabrous, pyramidal, up to 8 cm. long; flowers 5-merous, sessile in clusters of 3--5. Hypanthium glabrous, hemispheric, about 2 mm. long. Calyx 0.8 mm. long, the tube about equaling the very thin depressed-triangular lobes; exterior teeth adnate, acute, shorter than the sepals. Petals white, quadrate-obovate, about 1 mm. long and wide. Stamens isomorphic; filaments geniculate near the summit; anthers of *Cremanium*, broadly oval, 2-celled, opening by a large terminal pore; connective thickened and widened around the base of the thecae.

Type, Cárdenas 3984, collected near Chulumani, Bolivia, in open places on wet slopes, altitude 2700 m., deposited in the herbarium of the New York Botanical Garden. In the section Cremanium only a few species are hirsute with unbranched hairs; these are numbered 413 to 420 in Cogniaux' Monograph, while five others have been described more recently. Some of these have larger pediceled flowers; others have leaves pubescent to scabrous above, or narrower or 3-nerved leaves and not one has the glandular pubescence of our species. In every flower dissected the anthers lie at a right angle to the usual position. This feature probably has no taxonomic significance but has served to suggest the specific name.

In 1931, when I discussed the myrmecophilous species of Clidemia, I called attention to the apparent close relation of Clidemia ciliata Don to the plant then generally known as Maleta testiculata (Triana) Cogn. and transferred the latter to Clidemia. The gradual accumulation of herbarium material since that time has served to confirm this opinion. I also noted that formicaria had been observed on only one specimen of C. ciliata. The presence or absence of formicaria seems to be merely a secondary character to be subordinated to the more important features of hypanthium, stamens, and stigma and the general aspect.

Four other described species are also referable to this species-group: C. cymosa Gl. (1925) of Colombia, C. tovarensis Pitt. (1947) of Venezuela, C. elata Pitt. (1947) of Venezuela, and C. impetiolaris (Naud.) Cogn., described originally as C. pilosa by Don (1823). I have been able to examine types or isotypes of all six species and have concluded that they should be reduced to three. All are variable as to size of plant, leaf and flower, density of pubescence, and development of formicaria but the nature and extent of these variations are not sufficient, in my opinion, to warrant segregation of additional species.

The original collections of C. ciliata and C. pilosa by Ruiz and Pavon in Peru are not specifically separable. When combined into one, C. ciliata is the name to be maintained, partly because it has been in general use for many years and partly because C. pilosa has been used as an invalid homonym for a Jamaican plant.

In describing C. testiculata, Triana had before him one of his own collection from the vicinity of Villavicencio and a second collected by Moritz in the Venezuelan Andes of Mérida. The former is the actual type: it agrees better with his description, while his phraseology makes it evident that the Moritz plant was merely another specimen. The leaves of the type are ovate-oblong in shape, widest near the middle, and the cyme has a long peduncle. On the Moritz plant, the

leaves are widest well below the middle and the cyme is sessile, the three branches arising essentially from the axil of the leaf.

These characters of the typical C. testiculata are precisely those which were used in distinguishing my C. cymosa, also from Villavicencio. My species is accordingly reduced to synonymy.

For many years past, the epithet testiculata, either in Maieta or in Glidemia, has commonly been used for the Mérida plant or others conspecific with it. It is now necessary to find a name for it and the need was apparently not met until 1947, when Pittier described two new species from Mérida, C. elata and C. tovarensis. A careful examination of isotypes indicates that these two are conspecific with each other and with the Moritz plant. As the name to be maintained for this common species I choose C. elata. It is widely distributed and proportionately variable. Plants from Venezuela and the eastern Cordillera of Colombia have leaves sessile or nearly so and open, loosely flowered cymes up to 6 cm. long. Plants from El Valle and Antioquia may have similar cymes, but the leaves average larger and at least one of each pair is petiolate, the petiole up to 2 cm. long. Other plants from these two states have smaller leaves, up to 8 cm. long and proportionately narrower, and very densely congested cymes. I see no present reason for separating them as species or for giving them infraspecific names.

The three species, as now understood by me, may be distinguished by the following key:

- Pubescence of the younger stems, branches of the cyme, and hypanthium composed of stellate hairs, usually forming a dense tomentum; pubescence of the lower leaf-surface of short stipitate-stellate hairs. C. ciliata.
- Pubescence of the younger stems, branches of the cyme, and hypanthium composed primarily of simple hairs (a few of them possibly glandular); pubescence of the lower leaf-surface entirely of simple eglandular bristles.
- Cyme 10--15 cm. long, on a peduncle
5--8 cm. long. C. testiculata.
- Cyme sessile or with an obscure peduncle up to 5 mm. long. C. elata.

Leandra Phelpsiae sp. nov. Frutex caule pubescente; folia petiolata, ovato-lanceolata vel ovata, acuta vel acuminate, minute undulata, basi subcordata, supra glabra, subtus atro-puncticulata, 5-nervia; flores 5-meri sessiles fasciculati in panícula terminali ramosa glandulosa; hypanthium

plus minus glandulosum; calycis tubus fere truncatus, dentibus exterioribus parvis subulatis; petala non visa; stamina isomorpha.

Branching shrub, the stems and petioles densely pubescent with simple spreading hairs. Leaves ovate-lanceolate to ovate, up to 11 by 6.5 cm., acute to acuminate, minutely and obscurely undulate, subcordate at base, glabrous and more or less shining on the upper side and on the primary veins minutely strigose, beneath glabrous, freely black-punctulate, pubescent like the petioles on the primaries and sparsely so on the secondaries, 5-nerved, with an outer pair of marginal veins. Flowers 5-merous, subsessile in small cymes at the ends of a repeatedly branched panicle 1--1.5 dm. long, on a sparsely glandular-pubescent peduncle 5--7 cm. long. Hypanthium short-cylindric, 2.8 mm. long, densely pubescent with short, spreading, simple hairs, also sparsely glandular-hirsute with stouter hairs about 0.4 mm. long. Calyx-tube prolonged 0.5 mm., truncate, the exterior teeth spreading, subulate, 0.4 mm. long. Petals lacking. Stamens straight and erect, isomorphic; filaments flat, 1.5 mm. long; anthers 3.4 mm. long, straight, subulate, the connective slightly raised near the base. Ovary superior, prominently 10-ribbed, glandular-setose at the summit; style glabrous, 3 mm. long.

Type, Phelps 474, collected on Serranía Parú, in southern Venezuela, deposited at the New York Botanical Garden.

Petals seem to be completely lacking, even in the unopened flowers. The plant has been referred to Leandra by its general habit and by the structure of the connective. It is quite unlike every other species of the genus so far as they are known to me. Only one plant was observed by the collector, in whose honor the species has been named.

Graffenrieda grandifolia sp. nov. Frutex grandifolius; folia late rotundato-elliptica, basi subcordata, 3-nervia, nervis lateralibus ad marginem proximis; flores 5-meri breviter pedicellati in racemis spiciformibus ut videtur paniculatis; calyx calyptratus ad anthesis irregulariter ruptus.

Shrub 4 m. tall, glabrous to the inflorescence. Petioles stout, 4--5 cm. long. Blades subcoriaceous, broadly elliptic, as much as 30 cm. long by 23 cm. wide, at the summit broadly rounded, entire, broadly rounded below to a subcordate base, 3-nerved, the lateral pair about 7 mm. from the margin and paralleled by an outer arcuate marginal vein. Inflorescence apparently a compound raceme, the axes densely and minutely pubescent; pedicels 3--5 mm. long. Hypanthium thick-walled, 6.6 mm. long to the torus, densely pubescent with simple hairs about 0.2 mm. long. Calyx rounded in the bud, ruptured into a few irregular lobes and deciduous early almost at the torus. Petals white, obtusely rounded, ovate-

oblong, 14 mm. long, slightly inequilateral. Stamens isomorphic, all pointed in one direction; filaments mostly twisted toward the base, about 5.5 mm. long; anthers arcuate, subulate, convolute, about 6 mm. long; connective prolonged into a sharp, subulate, erect, dorsal spur 1.9 mm. long.

Type, Uribe Uribe 1890, from Hacienda San Agustín, cerca al Río Samaná, Nariño, Antioquia, altitude about 1000 m., in the United States National Herbarium. Several species of Graffenrieda are characterized by lateral leaf-nerves placed very near the margins, but it will be impossible to discuss the relationship of our plant until these species are better known.

More peculiar species of Blakea and Topobea continue to arrive from the wetter parts of tropical America, and there is good reason to believe that still others await discovery. As I have noted before, there is no means of distinguishing the two genera except by the stamens, and these may be lacking in herbarium material. Of the eight described below, all but two exhibit stamens. These are placed in Topobea because they have a distinct similarity in habit to other species of that genus.

Topobea elliptica sp. nov. Frutex epiphyticus, caules primo sparsim furfuracei pilis ovato-inflatis atque glanduloso-hirsutis; folia sessilia amplexicaulia oblonga vel obovato-oblonga; flores 6-meri, longe pedicellati ex axillis foliorum; bracteae distinctae foliaceae rotundatae hypanthium aequantes; sepala triangularia; petala staminaque desiderantur.

Epiphytic shrub about 2 m. tall; upper part of the stem with a sparse and deciduous indument of short, stoutly conic hairs interspersed with slender, spreading, glandular hairs, the same developed on the bracts and sparsely on the leaves. Leaves sessile, oblong or obovate-oblong, up to 7 cm. long and 4.5 cm. wide, rounded at the summit, subcordate-clasping at base, 3-nerved. Pedicels axillary, solitary, up to 4 cm. long. Flowers 6-merous. Bracts foliaceous, separate to the base, broadly rounded, about equaling the hypanthium. Sepals triangular, recurved after anthesis.

Type, Allen 5001, from Robalo Trail, northern slopes of Cerro Horqueta, Province of Bocas del Toro, Panama, altitude 1800 to 2100 m., preserved in the herbarium of the Missouri Botanical Garden. In general aspect the plant is reminiscent of T. Brenesii of Costa Rica, to which it is probably closely related. Our plant has much longer pedicels and narrower leaves.

Topobea cordata sp. nov. Frutex parvus epiphyticus glaber; folia sessilia ovata acuta integra subcordata 5-nervia; flores 6-meri, brevissime pedicellati et solitarii in axillis foliorum; bracteae distinctae foliaceae, hypanthio longiores; sepala late elliptico-ovata, hypanthium aequantia. Petala staminaque desiderantur.

Epiphytic shrub 0.5 m. tall, smooth throughout. Leaves sessile, ovate, as much as 7.5 by 5 cm., acute, rounded to a subcordate base, entire, 5-nerved with an additional obscure pair of marginals. Flowers 6-merous, solitary in the axils; pedicels about 1 mm. long. Bracts foliaceous, broadly elliptic, distinct to the base, the outer 11 mm., the inner 8 mm. long. Hypanthium hemispherical, 3.8 mm. long to the torus. Calyx-tube prolonged about 0.7 mm.; sepals broadly elliptic-ovate, 4 mm. long from the torus, 3 mm. wide, obtuse, somewhat imbricate at base. Petals and stamens lacking.

Type, Allen 4178, collected in the Cerro Pajita, north of El Valle de Antón, Coclé Province, Panama, altitude 1000 to 1200 m. Species with strictly sessile leaves are few in Blakea and Topobea. Our plant is quite unlike any other described species in either genus, and is assigned to Topobea because of its superficial resemblance to T. stellaris.

Topobea Cooperi sp. nov. Frutex epiphyticus, caulibus nodis incrassatis; folia petiolata, elliptica vel elliptico-ovata, glabra, abrupte rotundata in apiculum brevem, basi late cuneata, utrinque glabra, 3-nervia fere 3-plici-nervia, venulis secundariis ca. 0.6 mm. dissitis; pedunculi fasciculati; bracteae distinctae exteriores acutae interiores breviores rotundatae; calyx in alabastro fere clausus ad anthesin irregulariter ruptus.

Epiphytic, reported up to 1 m. tall. Stems thickened at the nodes, glabrous. Petioles stout, 1--2 cm. long. Blades elliptic to elliptic-ovate, up to 10 cm. long, about half to two-thirds as wide, abruptly narrowed to a short slender point, very broadly cuneate at base, glabrous on both sides, 3-nerved or almost 3-plici-nerved, with an additional pair of marginal veins; secondary veins straight, fine, 0.5--0.7 mm. apart. Flowers 6-merous, superposed in axillary clusters of 3--5 on pedicels 2--11 mm. long. Bracts distinct, the outer oblong-ovate, 8 mm. long, 4.5 mm. wide, acute, thinly and sparsely furfuraceous, the inner broadly rounded or subtruncate, about two-thirds as long. Hypanthium at anthesis subcylindric, 6 mm. long, glabrous. Calyx in bud ovoid, almost closed, at anthesis irregularly torn into several segments. Petals pink, 11.5 mm. long, 6 mm. wide, very unsymmetrical. Stamens isomorphic; filaments flat, 4.7 mm. long, glabrous; anthers coherent in a ring, lance-subulate, 6 mm. long, connective prolonged at base into a straight subulate spur 0.8

mm. long. Style 13 mm. long, tapering distally to a punctiform stigma.

Type, Cooper 199, from the Cricamola Valley, Bocas del Toro Province, Panama, in the herbarium of the New York Botanical Garden. It resembles Standley's species T. pluvialis and T. urophylla in general aspect, but bears more numerous flowers on shorter stalks and differs notably in the structure of the calyx.

Topobea praecox sp. nov. Arbor caulibus crassis et internodiis ramorum floriferorum brevissimis; folia ad anthesin nondum explicata, laminae ellipticae acuminatae; flores fasciculati pedicellati; bracteae distinctae, subaequales, late rotundatae, glabrae; sepala breviter ovata, apice rotundata; petala purpurea.

Shrub or tree 6--20 m. tall, the smooth branches thick and rather fleshy; internodes on the flowering branches only 5 mm. long. Leaves lacking or very immature at anthesis, 5-nerved, apparently elliptic and acuminate, certainly as much as 10 cm. long, the secondary veins 1--2 mm. apart. Flowers 6-merous, in fascicles of 2 or 3, on essentially smooth pedicels 1 cm. or less long. Bracts separate to the base, glabrous or nearly so, rotund or a little wider than long, the outer 8 mm., the inner 7 mm. long. Hypanthium broadly campanulate, 4.7 mm. long, the basal portion obscurely ribbed, thin-walled, the upper thicker and rugulose. Calyx-tube 1.7 mm. long, slightly flaring; sepals depressed-ovate, 3.3 mm. long from the sinuses. Petals 17 mm. long, 9 mm. wide, narrowly and obliquely obovate, rose-purple. Filaments flat, about 13 mm. long; anthers straight, subulate, coherent in a ring, 9 mm. long, opening by 2 minute ventro-terminal pores; connective prolonged into a conic spur 1.1 mm. long.

Type, Allen 2788, from the vicinity of La Mesa, near El Valle de Antón, Coclé Province, Panama, in the herbarium of the New York Botanical Garden. Allen 1742 and 2067 are conspecific and come from the same locality, altitudes of 600--1000 meters. Allen 294 is apparently the same, but was collected in Darien Province at only 15 m. altitude. Smith 1844 from Alajuela Province, Costa Rica, also belongs here. Our T. praecox seems to be closely related to T. Regeliana, but in that species the leaves are full grown at anthesis, while the calyx-lobes are essentially obsolete.

Blakea foliacea sp. nov. B. gracili Hamal. affinis sed differt foliis oblongo-ellipticis manifeste 5-plex-nerviis, venulis secundariis 1--1.5 mm. dissitis, pedunculis crassis et pubescentibus, calycis lobis late triangularibus, petalis anguste cuneato-obovatis valde asymmetricis.

Tree up to 18 m. tall, the younger parts, petioles, and peduncles closely pubescent with red-brown hairs. Petioles slender, 1--2 cm. long. Leaf-blades oblong, oblong-elliptic, or somewhat obovate-oblong, up to 14 cm. long, half as wide, abruptly acuminate to a slender tip 10--12 mm. long, obtuse to rounded at base, glabrous, distinctly 5-ply-nerved, the outer pair in mature leaves 3--5 mm. from the margin, with an additional pair of marginal veins; secondary veins 1--1.5 mm. apart. Peduncles solitary in the axils, 3--6 cm. long, about twice the diameter of the subtending petioles. Bracts foliaceous, separate to the base, spreading, ovate or ovate-oblong, the outer about 3 cm. long and 2 cm. wide, the inner about two-thirds as large. Hypanthium cup-shaped, 6.5 mm. long to the torus. Calyx saucer-shaped, about 2 mm. wide to the broadly rounded sinuses, the six lobes depressed-triangular, about 1.5 mm. longer. Petals white, cuneate-obovate, 3 cm. long, very unsymmetrical. Anthers broadly oval, 6 mm. long; connective barely elevated at base into a minute protuberance.

Type, von Wedel 2219, collected at Fish Creek, vicinity of Chiriquí Lagoon, Bocas del Toro Province, Panama, in the herbarium of the New York Botanical Garden. Von Wedel 2277, from Fish Creek Mountains, and Allen 2312, from the vicinity of La Mesa, Coclé Province, altitude 1000 m., are the same. The plant has heretofore been referred to *B. gracilis* Hemsl. It resembles that species superficially, but differs in the features stated in the diagnosis above.

Blakea crinita sp. nov. *Arbuscula macrophylla crinita*; *Folia coriacea* late elliptica, utrinque rotundata, 5-nervia, supra fere glabra, subtus ad nervos hirsuta; flores 6-meri, subsessiles, solitarii vel bini in axillis foliorum. Bractee dense hirsutae; petala flabellato-obovata, magna; stamina isomorpha, late elliptica; connectivum minutissime calcaratum.

Stout spreading shrub 3--6 m. tall. Upper parts of the stem and petioles densely hirsute with crowded hairs up to 4 mm. long. Petioles 1.5--3 cm. long. Blades broadly elliptic, coriaceous, up to 14 cm. long and 11 cm. wide, round at both ends, 5-nerved with an extra pair of marginal veins, smooth and dull green above (at least when full grown), long-setose on the primary nerves beneath, slightly so on the secondary veins, and very sparsely pilose on the surface. Flowers 6-merous, solitary or paired, and essentially sessile in terminal and axillary clusters. Petals pink, flabellate-obovate 21 mm. long, 18 mm. wide. Stamens isomorphic; anthers flat, broadly elliptic, 6 mm. long, rounded at both ends, opening by two minute pores; connective bearing near the base a spur only 0.2 mm. long.

Type, Allen 3956, from the elfin forest, crest of Cerro Pajita, north of El Valle, Coclé Province, Panama, altitude 1200 m. The involucre and hypanthium are so densely hirsute that their structure could not be determined satisfactorily. There is no doubt of the close relationship of this species to B. brunnea, from which it differs in its longer petioles, shorter pedicels, longer pubescence of the stem, and densely hirsute veins of the leaves.

Blakea parvifolia sp. nov. Arbuscula parvifolia; folia cuneato-obovata, subito in apiculum rotundata basi longe cuneata; flores 4-meri, solitarii, breviter pedicellati in axillis foliorum; bracteae ad basin distinctae, hypanthio breviores; antherae semi-ovatae acutae, poris 2 dorso-terminalibus dehiscentes.

Stout spreading tree 10 m. tall with glabrous branches, the leafy twigs with internodes less than 1 cm. long. Leaves glabrous, essentially isomorphic. Petioles slender, about 7 mm. long. Blades cuneate-obovate, up to 35 mm. long, about half as wide, rounded above to a short obtuse apiculum, entire, long-cuneate at base, 3-nerved. Flowers solitary in the axils, 4-merous (at least as to the calyx), on glabrous pedicels about 1 cm. long. Bracts separate to the base, oblong-ovate, very blunt, shorter than the hypanthium. Hypanthium spherical, glabrous, 3 mm. long. Sepals depressed-triangular, somewhat spreading, acute, about 2 mm. long from the torus. Petals oblong-obovate, 8.4 mm. long, 5 mm. wide, obtuse. Stamens isomorphic, coherent in a ring, the filaments stout but flattened, 4 mm. long; anthers strongly flattened, semi-ovate, 3.2 mm. long, acute, emarginate at the tip, each pollen-sac opening by a separate dorso-terminal pore.

Type, Allen 3761, from crest of Cerro Pajita, El Valle de Antón, Coclé Province, Panama, altitude 1100 m. The one flower remaining had lost part of its petals and stamens but there was no evidence that there had been more than four of the one and eight of the other. The foliage reminds one of Blakea gracilis, except for its small size.

Blakea pauciflora sp. nov. Arbuscula; folia parva petiolata late elliptico-obovata apiculata; flores solitarii in axillis pedicellati 6-meri; bracteae distinctae late triangulares quam hypanthio paulo breviores; calycis tubus patulus hexagonus, lobis brevissimis tuberculiformibus.

Tree 6--7 m. tall, glabrous throughout. Younger stems slender, with 2 longitudinal furrows and appearing 4-angled. Petioles slender, 8--10 mm. long. Blades (excluding the tip) broadly elliptic-obovate, as much as 52 mm. long (including the tip) and 30 mm. wide, rounded above into an obtuse, narrowly triangular apiculum 6--10 mm. long, broadly cuneate at

base, 5-nerved, the lateral pair only 0.5 mm. from the margins, with an additional pair of obscure marginal veins, the secondary veins very fine, only 0.2 mm. apart; between the 3 central primaries at their base a pair of oblong formicaria 3--4 mm. long. Pedicels solitary, slender, about 2 cm. long. Flowers 6-merous. Bracts separate to the base, broadly triangular, each series 2.5 mm. long. Hypanthium broadly cup-shaped, 3 mm. long, 4.5 mm. wide across the top. Calyx widely flaring, 1.1 mm. wide at the sinuses, 1.5 mm. wide at the lobes, the latter represented by minute tubercles. Petals white, broadly semi-obovate, 9 mm. long. Filaments 3.8 mm. long; anthers oval, 2.7 mm. long; connective neither spurred nor elevated.

Type, Maurice 744, collected at the base of Sierra del Boquete, Panama, in the herbarium of the New York Botanical Garden. This is another of the numerous species of the genus whose relationship can not be profitably discussed until the classification of all of the species is greatly improved. It may be recognized easily by its foliar formicaria.

Blakea sphaerica sp. nov. Frutex glabra; folia oblonga, coriacea, breviter apiculata; flores 6-meri, pedicellati in axillis, solitarii vel bini; bracteae distinctae, exteriores coriaceae, late ellipticae, apiculatae, interiores breviores obovatae; calyx patulus vix lobatus, lobis minutis triangularibus; antherae horizontales, connectivo valde dilatato in calcar conicum.

Shrub 3 m. tall, glabrous throughout. Petioles about 1 cm. long. Leaf-blades coriaceous, oblong or elliptic-oblong, up to 12.5 cm. long by about half as wide, abruptly tapering to both ends or somewhat apiculate, 3-nerved, densely brown-punctulate beneath; secondaries 1.5-2 mm. apart, diverging at about 75°; basal sinus between the primaries concealed by tissue, forming a small cavity from which bristles protrude. Flowers 6-merous, solitary or paired in the upper axils, the pedicels 2--3 cm. long. Bracts separate to the base, coriaceous, the outer broadly elliptic, 32 mm. long, 28 mm. wide, apiculate, the inner obovate, acute, 24 mm. long. Hypanthium hemispheric, 8 mm. long. Calyx spreading, 1.5--3 mm. wide, the minute lobes triangular. Petals flabellate-obovate, 27 mm. long, pink. Filaments flat, 9 mm. long; anthers coherent, horizontal, about 4 mm. long, opening by 2 minute terminal pores; connective very much expanded into a conic spur 7 mm. high. Ovary wholly inferior, six-celled; style stout, 13 mm. long, tapering to a punctiform stigma.

Type, Johnson & Barkley 180838, collected in the mountains east of Sonson, Antioquia, Colombia, altitude 2800 m., in the herbarium of the New York Botanical Garden. It may be distinguished from other Colombian species by its large di-

morphic bracts and enormously expanded connectives. Another interesting feature is the development of small cavities at the base of the leaves which may serve as formicaria.

Conostegia Haughtii Gl. is combined with Conostegia micromeris Standley under the latter name.

Conostegia sororia Standley is combined with Conostegia puberula Cogn. under the latter name.

Conostegia excelsa Pittier, described originally from a flowerless specimen, has since been collected in flower, and proves to be Meriania macrophylla (Benth.) Triana.

Conostegia hirsuta nom. nov. (Cryptophysa setosa Standley & Macbride.) The original description is excellent and needs no emendation. Unfortunately the appropriate specific epithet can not be transferred, since it is already used for Conostegia setosa Triana. The two species are indeed closely related and differ most conspicuously in foliage characters. In C. setosa, of Colombia, the leaves are cuneate to a sessile base, while in C. hirsuta, of Panama, they are long-petioled and rounded at base.

Clidemia spectabilis Gl. (1931) and Clidemia reflexa Gl. (1939) are poorly known species of Costa Rica with the general habit of the well known C. setosa (Tr.) Gl., but belonging in a different section of the genus. I now have before me five other collections representing three closely related species. All have strongly reflexed hairs on the stem, as in C. reflexa; all have formicaria, as in C. spectabilis; all have slender exterior teeth much surpassing the ovate obtuse calyx-lobes, as in both of my original species. The leaves of all three are strongly long-setose beneath, but lack the underlying indument of villous hairs. These features will distinguish them from the two earlier species. I am reluctant to describe species from such scanty material, and do so only because two of them will be included in the forthcoming discussion of the melastomes of Panama.

Clidemia collina sp. nov. Frutex caulibus reflexo-setosis; paniculae congestae axillares setosissimae; flores 5-meri; formicaria tumida ad apicem petioli; laminae oblongo-ovatae, 7-nervi, supra sparse setosae, subtus setosae ad venas venulasque, inter venulas fere glabrae, paniculae congestae setosissimae; hypanthium campanulatum, 3.2 mm. longum, longe (usque 10 mm.) paucisetosum; dentes exteriores subulati, calycis lobis oblongis rotundatis multo longiores; corolla staminaque non visa.

Type (and only specimen examined), Allen 1820, collected at El Valle, Coclé Province, Panama, in the herbarium of the Missouri Botanical Garden.

Clidemia taurina sp. nov. *C. collinae* similis sed setae caulis formicarii et hypanthii multo breviores, et foliorum pagina inferior toto hirsuta; formicaria ovoidea didyma.

Type, H. von Wedel 1917, collected on Old Bank Island, Province of Bocas del Toro, Panama, in the herbarium of the Missouri Botanical Garden. Von Wedel's 703 and 925 are the same and come from the same vicinity.

Clidemia myrmecina sp. nov. Caulis reflexo-strigosus; petiolus ultra medium formicario lineari ornatus; folia magna, ovato-oblonga, 5--7-nervia, supra sparse setosa, subtus ad venas venulasque setosa; hypanthium poculiforme, 2.8 mm. longum, dense setosum; dentes exteriores subulati, calycis lobis longiores; petala alba, oblongo-obovata; stamina bene evoluta non visa.

Type, Metcalf and Cuatrecasas 30182, collected north of Dabeiba, Dept. Antioquia, Colombia, altitude 300-350 meters, in the herbarium of the University of California.

Heterocentron hondurensis sp. nov. Flores 4-meri, breviter pedicellati in cymulis paniculatis; hypanthium sparse hirsutum, pilis basi verrucosis; sepala glabra triangulari-lanceolata; petala ciliolata rosea; antherae exteriores lineares, connectivo longe producto ad apicem filamenti, infra filamentum in calcaria 2 longa; ovarium glabrum summo breviter 4-lobum.

Stem 4-angled, very thinly strigose, especially on the angles, more densely so distally. Petioles densely strigose, about 5 mm. long. Blades lance-oblong, up to 35 mm. long and 10 mm. wide, minutely pilose above, thinly strigose beneath, about 11-ply-nerved. Flowers 4-merous, short-pedicel, in terminal cymes forming a large panicle. Hypanthium 3 mm. long, sparsely covered with reddish warts each tipped with a slender hair 0.3 mm. long. Sepals triangular-lanceolate, 4.9 mm. long, acuminate to a carinate tip, glabrous. Petals obovate, pink, 5 mm. long, minutely glandular-ciliate. Stamens dimorphic; filaments 4.2 or 5 mm. long; anthers linear, 3.5 or 3.7 mm. long, the connective of the smaller not prolonged but minutely 2-lobed at base, that of the larger prolonged straight back 2 mm. to the summit of the filament and below the filament 1.9 mm. farther into two straight slender spurs. Ovary glabrous, prolonged at the summit into 5 short oblong lobes.

Type, Allen 3899, from clearing in pine and oak forests on Cerro Uyuca, Dept. Morazan, Honduras, alt. about 1500 m., in the herbarium of the Missouri Botanical Garden. It seems to be nearest to H. floribunda Gl., of Durango, Mexico, differing in its simple pubescence, and H. axillaris Naud., of southern Mexico and Guatemala, in which the ovary is setose.

NOTES ON POLYGONUM. V

J. F. Brenckle

Polygonum Exsiccatum (Avicularia) Fascicle II.

- No. 26. Polygonum aviculare L. var. ascendens Montand
 No. 27. Polygonum aviculare L. var. neglectum Rchb.
 No. 28. Polygonum aviculare L. var. rurivagum Gentil.
 No. 29. Polygonum aviculare L.
 No. 30. Polygonum aviculare L. var. procumbens Hayne
 No. 31. Polygonum aviculare L. form caespitosum A. & G.
 No. 32. Polygonum heterophyllum Lindm. form rubescens (Small)
 Brenckle, new status
 No. 33. Polygonum heterophyllum Lindm. form rubescens (Small)
 Brenckle, new status
 No. 34. Polygonum calcatum Lindm.
 No. 35. Polygonum calcatum Lindm.
 No. 36. Polygonum buxiforme Small
 No. 37. Polygonum buxiforme Small form montanum Brenckle, new
 form
 No. 38. Polygonum buxiforme Small form montanum Brenckle, new
 form
 No. 39. Polygonum leptocarpum Robins.
 No. 40. Polygonum patulum M. Bieb.
 No. 41. Polygonum Kelloggii Greene
 No. 42. Polygonum Watsonii Small
 No. 43. Polygonum Watsonii Small
 No. 44. Polygonum Watsonii Small
 No. 45. Polygonum Watsonii Small var. alpinum Brenckle, new
 variety
 No. 46. Polygonum polygaloides Meisn. form montanum Brenckle,
 new form
 No. 47. Polygonum confertiflorum Nutt.
 No. 48. Polygonum consimile Greene
 No. 49. Polygonum Austinae Greene
 No. 50. Polygonum Parryi Greene

- Nos. 26 to 33. Polygonum aviculare L. no doubt originated in Europe and has developed there into many races and forms. An attempt is made to fit names used and applied by Ascherson & Graebner to the varieties described in Europe.
- No. 26. Polygonum aviculare L. var. ascendens Montand
The stems are spreading, reclining, the ends ascending; the leaves are round at the ends. The specimen is a late summer form.
- No. 27. Polygonum aviculare L. var. neglectum Rchb.
Stems thin, mostly flat on the ground; leaves very narrow, linear, sharply pointed. Most American specimens so named are not the above, but late summer forms with reduced leaves of P. aviculare.
- No. 28. Polygonum aviculare L. var. rurivagum Gentil.
Plants mostly erect, stems thin, leaves narrow and sharply pointed; achenes usually smaller than in var. neglectum, 1.5 mm. long.
- No. 29. Polygonum aviculare L.
Plants are erect, or, where scattered or trampled upon, the stems are spreading and ascending or are flat on the ground.
- No. 30. Polygonum aviculare L. var. procumbens Hayne
Plants robust, flat on the ground, very common on trampled ground, roads, paths, in schoolyards, etc.
- No. 31. Polygonum aviculare L. form caespitosum A. & G.
The plant has many slender stems arising from the rootstock. It is a form common about sidewalks and is due to the destruction of the early stems.
- Nos. 32 & 33. Polygonum heterophyllum Lindm. form rubescens
(Small) Brenckle, new status
Small's description of Polygonum rubescens in Bull. Torrey Bot. Club 33: 56 (1906), for which this is a new status, gives no reference as to why the epithet 'rubescens' was applied to this plant nor does the type specimen show any particular coloration. Specimens collected in Alberta by Dr. George Turner do show a red tint on parts of the plant body and the flowers. These specimens, as well as the type, are stout forms of P. heterophyllum Lindm., a common species in Canada. There is nothing in Small's description nor in Rydberg's manuals to distinguish it from P. heterophyllum.

Nos. 34 & 35. Polygonum calcatum Lindm.

Ascherson & Graebner give the following description: "Stems flat on the ground; leaves small, elliptic, ovate, or obovate, nerved beneath, pale or gray-green, the upper similar to the lower; pedicels articulated above; perianths slit to the middle, constricted, the sections light-green with white edges; stamens 5; achenes 2--2.5 mm. long, broadly ovate to lanceolate, compressed near the top, smooth or rarely punctate or striate, black."

No. 36. Polygonum buxiforme Small

Annual or perennial; stem usually prostrate, 3--12 dm. long; leaves oblong, elliptic, or oblanceolate, 0.5--2.5 cm. long, usually obtuse, often crisped on the margin; perianth 2--2.5 mm. long; achene 2--2.5 mm. long, dark brown, usually dull, granular or smooth.

Nos. 37 & 38. Polygonum buxiforme Small form montanum Brenckle, new form

Plantae montanae lucidae simplices erectae 1--10 cm. altae, saepe ramosae reclinatae.

Plants from high elevations, 6000 to 10,000 feet altitude, are lighter in color, simple, erect, from 1 to 10 cm. high, sometimes branched and reclining at somewhat lower altitudes.

No. 39. Polygonum leptocarpum Robins.

Plants similar to P. prolificum, but more slender and the achenes 3 mm. long.

No. 40. Polygonum patulum M. Bieb.

Stems single or few, erect, branched with slender elongated twigs, the stem-sections elongated; leaves elongate, pointed at each end; ocreae translucent, 6--8-nerved; inflorescence elongate, at the upper ends of the stems; perigonium red or rose-colored, 2--2.5 mm. long, persistent; achenes pointed, finely punctulate-striate, black, 2 mm. long.

Nos. 41 to 45. Polygonum Kelloggii Greene & P. Watsonii Small

Two closely related species and sometimes difficult to distinguish. They are small mountain to alpine forms, usually slender and short. In both the mature achene is a pale brown, dull, punctate or very finely striate, 1.5 mm. long, or longer in the form rostratum. The difference between the two is that P. Kelloggii has 3 anthers while P. Watsonii has 8. P. Watsonii also sometimes has white-margined bracts.

No. 45. Polygonum Watsonii Small var. alpinum Brenckle, new

variety

Plantae pumilae graciles 1--3 cm. altae; foliis in bracteas mergentibus, eorum paucis albo-marginatis; inflorescentiis racemiformibus, racemis terminalibus 1--3 compactis; fructibus striatis fuscis 1.5 mm. longis; vel forma rostratum fructibus longioris ad apicem attenuatis.

Dwarf slender plants 1--3 cm. high; leaves merging into the bracts, a few of which have white margins; inflorescence in the form of 1 to 3 terminal compact racemes; achenes striate, dark, 1.5 mm. long -- or longer when the "form rostratum", with attenuated apex, has developed.

No. 46. Polygonum polygaloides Meisn. var. montanum Brenckle, new variety

Haec varietas a forma typica speciei recedit planta compactiora, caulis 4--8 cm. longis gracilibus simplicibus vel ramosis.

Stems 4--8 cm. long, slender, simple or branched; the plant more compact than in the species itself, but otherwise the same. The type was collected by Prof. Ray J. Davis (no. 3283) at White Bird Summit, Idaho County, Idaho.

No. 47. Polygonum confertiflorum Nutt.

Stems slender, wiry, 3--20 cm. long; inflorescence in dense spikes, with white-margined bracts; achene pyramidal, with a somewhat acuminate apex, black, sharply striate, 2 mm. long.

No. 48. Polygonum consimile Greene

"Allied to P. Engelmannii, like it in habit, but larger, less compactly branching, rather more erect, the larger plants a foot high; stems subterete, only the floriferous branches angular, herbage destitute of scurfiness; leaves spatulate-linear, the largest 1 1/4 inches long, veinless, acute, the hardy scabrous margins revolute; stipules when young and untorn bearing 2 or 3 setiform teeth; perianths mostly solitary at the nodes, much more elongated and narrow than P. Engelmannii, and tightly closed over the achene, this with narrowly rhomboid faces and the whole scarcely shining, impressed-punctulate under a strong lens" (Greene in Pittonia 5: 202). The specimens here distributed are from the same general region as those described by Greene, but are somewhat larger and could be referred to P. Douglassii, to which the species is also related. The dull finely punctate achene, however, of P. consimile, closely surrounded by the perianth, serves to distinguish it from P. Douglassii (which has a smooth shining achene) and from P. emaciatum Nelson (which has a striated achene). Some of these specimens have one or more branches with a much con-

densed inflorescence which I consider to be merely a pathological condition. (See P. commixtum).

No. 49. Polygonum Austinae Greene

No. 50. Polygonum Parryi Greene

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Polygonum durum Brenckle, sp. nov.

Planta perennis; caulibus confertis erectis herbaceis; ocreis hyalinis ovalibus, ad apicem dentatis; foliis linearibus sessilibus ut videtur subsucculentis 1.5 cm. longis, 3 mm. latis; perianthis in nodis infimis 3--5 confertis duris persistentibus, ad apicem 5-partitis, limbo brevi patente 0.5--1 mm. longo pallido-viridi rubello-tincto; fructu rotundato-elongato nigro 3 mm. longo, ad apicem triangulari.

Perennial by a slender rootstock, with a crown from which crowded erect herbaceous stems spring; ocreae hyaline, oval, half the length of the leaves, with several teeth at the tip; leaves linear, sessile, appearing to be somewhat fleshy, 1.5 cm. long, 3 mm. wide; perianths crowded about the crown, on the lower nodes of the stems, 3--5 per node; each perianth composed of a hard, tough, enduring membrane closely enveloping and firmly attached to the achene, 5-parted at the tip only, 3 mm. long, with a short spreading limb 0.5--1 mm. long, pale green and reddish-tinted; achene roughened by the attached perianth, round-elongated, triangular at the tip only, black, 3 mm. long.

The type was collected by Gauba at Pic Kuh, near Keredj, in the province of Kazvin, Iran, in 1948, and is K. H. & F. Rechinger, Iter Iranicum II, no. 2034 K. The specimen is small and the tops of the herbaceous stems have been eaten off, which makes it rather unfit for description as the type of a new species. However, the outstanding characteristics of its fruiting parts are nowhere matched in the descriptions of the many known Asiatic polygonums. These characters are unique, cannot be mistaken, and should be recorded. The perianth of P. polycnemoides Jarb. & Spach also closely envelops its achene, but is not firmly attached, the species is an annual, the achene is scarcely 2 mm. long, and the leaves are 1 cm. long and mucronate.

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On Persicaria Oneillii Brenckle

Since publication of this species additional robust material

has been collected by Reverend Ernest Lapage on the sandy shore of a lake and on sand-dunes near Naknek on the Alaska Peninsula. Plants of various sizes were found by him, varying from the large plant described below to the small ones measured and described in the original description.

The stems branch in radial fashion from the top of the taproot, creeping on the sand, 10 to 30 cm. long, composed of 4 to 6 robust sections, thickened and tapering toward the distal end and 3 to 6 cm. long; ocreae cup-shaped, hyaline or opaque, sometimes with green veins, or smooth, inconspicuously edged with fine bristles, evanescent; leaves lanceolate with a brown spot in the center, tapering to the petiole, 3 to 7 cm. long, 5 to 20 mm. wide.

This description is based on Lepage no. 24111, collected August 28, 1948.

THE FRUIT CHARACTER OF STROPHANTHUS, SECTION SYNCLINOCARPUS

Joseph V. Monachino

The fruit of Strophanthus Bullenianus was described and figured by M. T. Masters in the Gardeners' Chronicle in 1870. It is present on the Kew sheet of Mann 2247, which I consider the type collection of the species.

While no one has hesitated to accept the flowers of S. Bullenianus as genuine Strophanthus, the fruit of the type material of this species, which is detached, has been hitherto adjudged a mixture and rejected altogether from the genus by all outstanding taxonomists who have studied it. This is no wonder, for the long, slender mericarps of S. Bullenianus are clearly convergent, subparallel in drying, whereas those intimately associated with Strophanthus as a whole are strongly divaricate. The seeds of S. Bullenianus are likewise extremely unusual. The seed-coat is closely pubescent with short appressed hairs, as is common in other members of the genus, but is also invested by matted long hairs of the coma. The coma has the appearance of a wad of wool, rather than of distinct and straightish silky bristles. The awn is embedded in the coma. Botanists have with justice, indeed, thought it incredible that such fruit and seeds should actually belong to a Strophanthus.

Otto Stapf (Fl. Trop. Afr. 4 (1): 175. 1902) wrote: "The fruit figured by Masters belongs to a species of Pleioceras." Gilg (in Engler, Monogr. Afr. Pfl.-Fam. 1903: 38) wrote that the seed sent to him by Masters was not of Strophanthus.

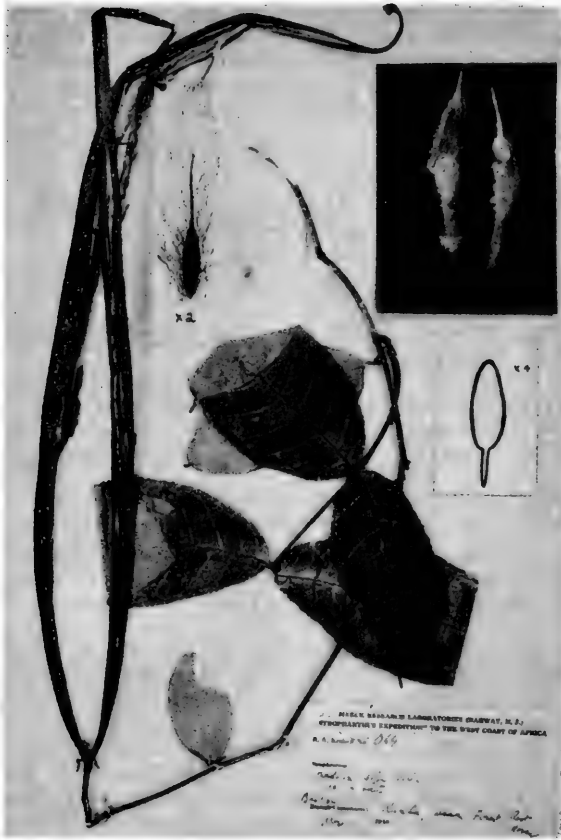


Plate 1

Strophanthus Bullenianus Mast.

R. D. Meikle, at the Herbarium of the Royal Botanic Gardens at Kew, has recently (August, 1950) examined the type sheet of S. Bullenianus and has communicated to me: "...the fruit and seeds of other African Strophanthus spp. are, as a whole, so uniform and distinctive, that one hesitates to accept those of 'S. Bullenianus' as genuine." The seeds, he writes, "...certainly resemble those of Pleioceras or Wrightia more than true Strophanthus. In size, indumentum, etc., they are curiously unlike other Strophanthus seeds, and I find it difficult to believe that they really 'belong' to the flowering specimens."

Not satisfied with the evidence for excluding the type fruit, I enquired of Kew: Has the fruit of S. Bullenianus been definitely matched with that of any other plant? Are there, for the purpose of drawing comparisons, any fruiting specimens of S. erythroleucus, S. Wildemanianus, and S. parviflorus, species which I believe to bear close affinity with S. Bullenianus? Are the cotyledons of S. Bullenianus convolute, as they are in Pleioceras?

All or nearly all of the African Apocynaceae fruits and seeds preserved at Kew were examined by Meikle and he found nothing to match that of S. Bullenianus. There are no fruits of S. erythroleucus, S. Wildemanianus, and S. parviflorus at Kew.

Regarding the character of the cotyledons Meikle wrote: "I have examined one of the two preserved seeds. The results are not very helpful, for the cotyledons are neither plane as in Strophanthus nor convolute as in Pleioceras, but somewhere intermediate between the two, i.e. plane above and convolute below."

The question of the authenticity of the S. Bullenianus fruit would still be controversial, with the preponderance of evidence apparently against authenticity, were it not for a fruiting specimen of S. erythroleucus collected by L. J. Brass and E. F. Woodward on the Upjohn-Penick Expedition of 1949-1950. The specimen was obtained from the same vine which had provided the flowering material collected by B. A. Krukoff and C. W. Chew (thanks are due to Messrs. Brass and Woodward for this information, as well as for the excellent and copious field data, often accompanied by photographs, presented with their interesting collection). I have examined the fruiting and flowering plants and am sure that they belong to the same species. This is therefore the first instance where fruit and flower are positively associated in a species of the S. Bullenianus affinity. The fruit and seeds of S. erythroleucus resemble unmistakably those of S. Bullenianus. They thus clearly indicate the genuineness of the original fruit collection of the latter species.

As additional evidence, new fruiting material of S. Bullen-

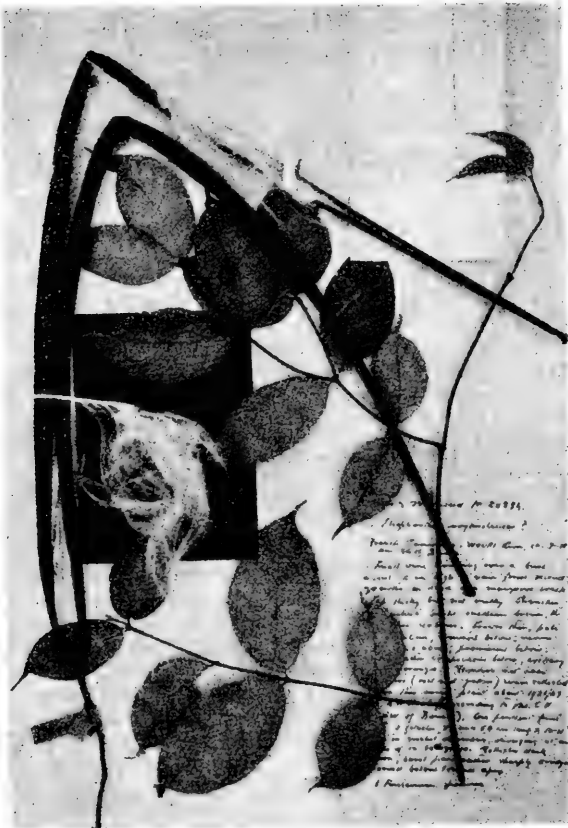


Plate 2

Strophanthus erythroleucis Gilg

ianus has been discovered by me amongst the unidentified specimens collected by Mr. B. A. Krukoff. This specimen is perhaps the basis for the reference to the species made by Krukoff and Letouzey (Rev. Inst. Bot. Appl. 329--350: 125, 132. 1950). It may, however, be argued as follows that these authors' concept of S. Bullenianus was founded on material other than that examined by me. In their "Clef de determination d'apres les fruits" S. Bullenianus is distinguished from S. hispidus on vegetative characters and "follicules atteignent 60 cm de long, termines en une extrémite ligneuse epaissie." Their description notes merely that the follicles reach up to 60 cm. in length. No collection is cited, and nothing is said by Krukoff and Letouzey regarding the very remarkable fruit and seed character of S. Bullenianus. In their citation of the original publication of the species they exclude the fruit: "sauf fruits." The plant is associated by them with others such as S. hispidus and S. sarmentosus which bear no affinity with S. Bullenianus. Mr. Krukoff has, in his own hand, crossed out the name Strophanthus printed on the label of his specimen of S. Bullenianus examined by me.

On the basis of the striking fruit and seed character of S. Bullenianus and S. erythroleucus, supported by their floral structure, I propose a new section in the genus Strophanthus. The generic concept regarding fruit and seed morphology must therefore be amplified to embrace the following:

STROPHANTHUS, Sect. SYNCLINOCARPUS Monachino, sect. nov.

Frutices scandentes; lobis corollae caudatis; antheris prope apicem tubi corollae insertis, summitatibus sterilibus obtusis; mericarpis gracilibus convergentibus non divaricatis; coma tunicam seminis circumdata.

Vines; corolla-lobes tailed; anthers inserted near the summit of the corolla-tube, their sterile tips short, the basal lobes obtuse; mericarps slender, convergent, not divaricate; coma investing the seed-coat.

The type species of the section is Strophanthus Bullenianus Mast., Gard. Chron. (1870) 1471, fig. 257.

The section Synclinocarpus comprises four species. S. Bullenianus was the first described and is the best known in the section. It has been collected in southern Nigeria, the Cameroons, and Gabon. Thomas Christy (New Commercial Plants and Drugs, No. 9, p. 61) referred to the fruits and seeds of this species in 1886. He received material in the form of a mass of a fragmented follicle and woolly seed tufts, with very few seeds. S. Wildemianus Gilg differs from S. erythroleucus Gilg, described at the same time, merely in the slightly longer tails of its corolla-lobes and in the slightly longer petioles. It is presumably known only from the type collection consisting



Plate 3

Strophanthus erythroleucus Gilg

of flowering material obtained in 1901 by Gillet in Kimuenza, lower Congo. The cotypes of S. erythroleucus were collected at Gross-Batanga, Cameroons. C. W. Chew has seen living plants of the species at Port Harcourt, Nigeria, and in the vicinity of Douala, Cameroons. It is desirable to know more about variation in S. Wildemanianus to properly evaluate its distinction from S. erythroleucus. S. parviflorus Franchet, described in 1893, the fourth member of the section Synclinocarpus, is less closely allied with S. Bullenianus. I have examined eighteen collections of this, but not one was in fruit. It grows in the lower Belgian Congo, Gabon, and Angola. When its fruits and seeds eventually become known, it will be interesting to see whether the flower character has afforded a reliable criterion for prediction of the sectional position of the species.

Further study is needed in the morphology of the cotyledons in the species of section Synclinocarpus. Mention has already been made that R. D. Meikle found the cotyledons of the type of S. Bullenianus plane above and convolute below. I have examined the cotyledons of all Strophanthus species which provided adequate seeds and found them clearly plane. Very rarely abnormal seeds showed warped cotyledons, but not truly convolute. I dissected four mature seeds of the Krukoff collection of S. Bullenianus and observed these also to have completely plane cotyledons. The seeds of S. erythroleucus available to me are too immature to permit proper study of their cotyledons.

The individual mericarps of the two species whose fruits are known in the section Synclinocarpus resemble somewhat those of S. Barteri, but are longer. The seed coma of S. erythroleucus is less woolly in appearance than that of S. Bullenianus. What greater divergence from the type of the section S. parviflorus will present remains to be seen.

S. Bullenianus and S. Ledieni have been placed in section Eustrophanthus Pax, subsection Acuminati Pax (in Engler, Bot. Jahrb. 15: 367. 1892). The two species are incongruous. The latter must be associated with S. Emini, from which it differs rather strikingly in its fruit and little in its habit. The flowers of S. Ledieni and S. Emini are practically identical, and one may wonder whether it would be better to draw varietal, rather than specific, distinction between the two.

One may also wonder what importance is to be attached in general to the fruit in evaluating rank in Strophanthus. Follicular differences in this genus are sometimes not supported by floral distinctions. For instance, S. sarmentosus is represented in its eastern and southern range, the Ubangi, Belgian Congo, and Angola, by a variety with follicles very densely lenticellate. Conversely, it appears, judging from the few fruiting specimens thus far examined, that S. gardeniiflorus is merely an eastern variety of S. Tholloni with non-lenticellate

or but sparsely lenticellate follicles, the flowers being the same. I have observed rare instances where specimens of S. Emini that are alike even in fruit show upon dissection of the seeds puzzling differences in the cotyledons. As a rule, the base of the cotyledons in S. Emini is wedge-shaped and merges into the short peg-like conic radicle. In rare cases the cotyledons are rounded at the base and the radicle is longer, cylindrical, and distinct.

It is seen that the fruits are quite variable in Strophanthus and even marked differences in them sometimes define merely varieties, and thus fruit characters as principal bases for establishing sections should be selected with great caution.

F. Pax in his treatment of Strophanthus (in Engler, Bot. Jahrb. 15: 362--386. 1892) recognized three sections and eight subsections in the genus. One of the sections had been proposed by Baillon (Bull. Mens. Soc. Linn. Paris 1 (95): 757. 1888). Franchet (Nouv. Arch. Mus. Paris, ser. 3, 5: 249, 250. 1893) recognized only two of these sections and altogether disregarded subsections. Gilg (in Engler, Monogr. Afr. Pfl.-Fam. 1903) accepted the same two sections, none of Pax's subsections, and erected three subsections of his own. He proposed the subsection Roupellia (which Stapf, in 1902, Fl. Trop. Afr. 4 (1): 168 had treated as a section, and Wallich and Hooker, in 1849, Bot. Mag. pl. 4466, as a genus) to accommodate S. gratus, S. Tholloni, and S. gardeniiflorus. He submerged the subsection Christya, a group that is among the most worthy of sectional rank. Recently M. Pichon (Mem. Inst. Sc. Madagas., ser. B, 2 (1): 62. 1949) re-instated Christya in the generic category and elevated the section Roupellina to the rank of a genus.

It is thus seen that there has been no uniformity in the evaluation of the various elements of Strophanthus. The section Synclinocarpus described in the present paper is the first section in the genus to be proposed since 1902, and the first in the group ever to be based primarily on fruit character.

Explanation of plates

- 1 -- S. Bullenianus Mast. B. A. Krukoff 064, British Cameroons, Kumba, near Forest Rest House, November, 1949.
- 2 -- S. erythroleucus Gilg. J. L. Brass & E. F. Woodward 20834, French Cameroons, Wouri River, about 9 or 10 km. southeast of Douala, December, 1949.
- 3 -- S. erythroleucus Gilg. B. A. Krukoff & C. W. Chew 200, French Cameroons, Douala, Bois des Singes, November 25, 1949.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND
ERIOCAULACEAE. SUPPLEMENT 4

Harold N. Moldenke

Since the publication of my previous supplement to this list in April of this year several thousand additional specimens of these groups have passed through my hands. These have brought to light 19 new county records, 106 new state and province records, and 140 new country and island records. In accordance with the new recommendation adopted at the Seventh International Botanical Congress at Stockholm this past summer, all scientific epithets below the rank of genus are hereinafter written with a lower-case initial letter.

Dr. G. H. Kostermans has recently very kindly sent me a copy of a monographic study of the genus Teijsmanniodendron on which he has been working for some years and which is now in press. Unfortunately, permission to quote the several new names and combinations which he proposes in this work has not reached me as this supplement goes to press, so I cannot yet report on the changes which his studies necessitate in regard to our records from Burma, French Indochina, Thailand, Federated Malay States, Straits Settlements, Sumatra, Anambas Islands, British North Borneo, Sarawak, Borneo, Celebes, Lesser Sunda Islands, Molucca Islands, New Guinea, and cultivation.

CANADA:

Quebec:

Eriocaulon septangulare With. [Lévis, Maskinongé, Papineau, Saint Jean, & Saint Maurice Counties]

Ontario:

Verbena hastata L. [Essex County]

UNITED STATES OF AMERICA:

Virginia:

Eriocaulon decangulare L. [Norfolk County]

South Carolina:

Eriocaulon decangulare L. [Kershaw County]

Florida:

Lantana montevidensis (Spreng.) Briq. [Lee County]

Verbena canadensis (L.) Britton [Lee County]

Indiana:

Phyla lanceolata (Michx.) Greene [Hancock County]

Verbena bipinnatifida Nutt. [Orange County]

Verbena bracteata Lag. & Rodr. [Marion County]

xVerbena engelmannii Moldenke [Fulton & Greene Counties]

Verbena simplex Lehm. [Warren County]
Verbena stricta Vent. [Orange County]
Verbena urticifolia L. [Fulton County]

Minnesota:

Eriocaulon septangulare With. [Ottertail County]

MEXICO:

Bouchea prismatica var. brevirostra Grenz. [Tamaulipas]
Citharexylum fulgidum Moldenke [Hidalgo]
Citharexylum oleinum (Benth.) Moldenke [Hidalgo]
Phyla nodiflora var. rosea (D. Don) Moldenke [Federal District]
Syngonanthus caulescens (Poir.) Ruhl. [Veracruz]
Verbena neomexicana var. xylopoda Perry [Tamaulipas]

HONDURAS:

Avicennia nitida Jacq. is to be deleted
Callicarpa acuminata H.B.K. -- delete "Bay Islands" because
 these islands are better placed as a separate heading
Citharexylum caudatum L. -- delete "Bay Islands"

BAY ISLANDS:

Avicennia nitida Jacq. [Holbox]
Callicarpa acuminata H.B.K. [Roatan]
Citharexylum caudatum L.
Lantana involucrata L. [Holbox]
Lippia graveolens H.B.K. [Mugeres]
Phyla nodiflora var. longifolia Moldenke [Holbox]
Stachytarpheta jamaicensis (L.) Vahl [Mugeres]

PEARL ISLANDS:

Avicennia bicolor Standl. [San José]
Avicennia nitida Jacq. [San José]

HISPANIOLA:

Holmskioldia sanguinea Retz. [Dominican Republic]

COLOMBIA:

Lantana rugulosa H.B.K. [Nariffo]
Lippia origanoides H.B.K. [Santander]
Paepalanthus dendroides (H.B.K.) Kunth is to be deleted
Paepalanthus pilosus (H.B.K.) Kunth [Boyacá & Santander]
Paepalanthus schultesii Moldenke [Cundinamarca]*
Syngonanthus caulescens (Poir.) Ruhl. [Cundinamarca]
Syngonanthus vaupesanus Moldenke -- delete the asterisk
Verbena glabrata H.B.K. [Nariffo]
Vitex stahelii Moldenke [Méta]

VENEZUELA:

Paepalanthus dendroides (H.B.K.) Kunth is to be deleted
Phyla nodiflora (L.) Greene [Zulia]

Syngonanthus tenuis (H.B.K.) Ruhl -- delete the asterisk

PERU:

- Aloysia scorodonioides var. detonsa (Briq.) Moldenke [Lima]
Lantana canescens H.B.K. [Cuzco]
Lantana ferreyrae Moldenke [Amazonas]*
Lantana haughtii Moldenke [Amazonas]
Lantana reptans Hayek [Ancachs]
Lantana scabiosaeflora H.B.K. [Amazonas]
Lantana svenssonii Moldenke [Cajamarca]
Verbena occulta f. alba Moldenke [Ancachs]

BRAZIL:

- Aegiphila fluminensis Vell. [Federal District]
Aegiphila lhotzkiana Cham. [Maranhão]
Aegiphila obducta Vell. [Federal District]
Aegiphila sellowiana Cham. [Federal District]
Aegiphila vitelliniflora Klotzsch [Federal District]
Aloysia brasiliensis Moldenke [Rio Grande do Sul]
Aloysia lycioides Cham. [Rio Grande do Sul]
Aloysia virgata var. platyphylla (Briq.) Moldenke [Rio Grande do Sul]
Clerodendrum calamitosum L. [Amazonas]
Lantana armata Schau. [Pará]
Lantana camara L. [Pará]
Lantana camara var. aculeata (L.) Moldenke [Santa Catharina]
Lantana undulata Schrank [Santa Catharina]
Lippia angustifolia Cham. [Rio Grande do Sul]
Lippia arechavaletae var. microphylla Moldenke [Rio Grande do Sul]*
Lippia ekmani Moldenke [Rio Grande do Sul]
Lippia morongii Kuntze [Rio Grande do Sul]
Lippia ramboi Moldenke [Rio Grande do Sul]*
Lippia turnerifolia var. sessilifolia Moldenke [Rio Grande do Sul]*
Lippia villafloredana Kuntze [Rio Grande do Sul]
Paepalanthus claussenianus Körn. [Maranhão]
Paepalanthus cururensis Moldenke [Amazonas]
Paepalanthus decorus Abbiatti [Rio Grande do Sul]*
Paepalanthus hatschbachi Moldenke [Paraná & Rio Grande do Sul]*
Paepalanthus jahnii Ruhl. is to be deleted
Paepalanthus myocephalus var. minor Körn. [Pernambuco]
Paepalanthus supimus Körn. [Amapá]
Petrea riparia Moldenke [Amazonas]

- Stachytarpheta maximiliani var. glabrata Schau. [Paraná]
Stachytarpheta polyura Schau. [Rio de Janeiro]
Syngonanthus glandulosus Gleason [Amapá]
Syngonanthus reclinatus (Körn.) Ruhl. [Maranhão]
Syngonanthus tenuis (H.B.K.) Ruhl. [Pará]
Syngonanthus tricostatus Gleason [Goyaz]
Syngonanthus umbellatus (Lam.) Ruhl. [Amapá]
Syngonanthus vaupesanus Moldenke [Pará]
Verbena dissecta Willd. [Rio Grande do Sul]
Verbena gracilescens (Cham.) Herter [Rio Grande do Sul]
Verbena hatschbachi Moldenke [Paraná]*
Verbena herteri Moldenke [Rio Grande do Sul]
Verbena ovata Cham. [Rio Grande do Sul]
Verbena sessilis (Cham.) Kuntze [Rio Grande do Sul]
Vitex polygama var. bakeri Moldenke [Espírito Santo]
Vitex polygama var. hirsuta Schau. [Espírito Santo]
Vitex triflora Vahl -- delete "Rio de Janeiro"
Vitex triflora var. angustiloba Huber -- delete the asterisk
Vitex triflora var. kraatzii Huber -- delete the asterisk

MARAJO ISLAND:

- Avicennia nitida Jacq.
Vitex triflora var. angustiloba Huber
Vitex triflora var. kraatzii Huber

BOLIVIA:

- Priva boliviana Moldenke -- delete the asterisk

PARAGUAY:

- Priva boliviana Moldenke

URUGUAY:

- Verbena herteri Moldenke -- delete the asterisk

CHILE:

- Junellia digitata (R. A. Phil.) Moldenke [Antofagasta]
Phyla nodiflora var. reptans (H.B.K.) Moldenke [Atacama]
Verbena berterii (Meisn.) Schau. [Talca]
Verbena hispida Ruiz & Pav. [Concepcion]

ARGENTINA:

- Aloysia castellanosi Moldenke [La Rioja]
Aloysia catamarcensis Moldenke [La Rioja]
Aloysia ovatifolia Moldenke [San Luis]
Junellia asparagoides (Gill. & Hook.) Moldenke [Jujuy]
Junellia glauca var. cisandina (Niederlein) Moldenke [Neuquen]
Lantana montevidensis (Spreng.) Briq. [Santa Fé]
Lippia ekmani Moldenke -- delete the asterisk

Verbena bonariensis L. [San Luis]
Verbena peruviana (L.) Britton [Entre Ríos]
Verbena platensis var. stenodes Briq. [Jujuy]
Verbena stellarioides Cham. [Chaco]

FRANCE:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

SPAIN:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

AUSTRIA:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

IONIAN ISLANDS:

Vitex agnus-castus L. [Cephalonia]

RHODES:

Vitex agnus-castus L.

ITALY:

Phyla lanceolata (Michx.) Greene

Vitex agnus-castus var. caerulea Rehd.

Vitex agnus-castus f. latifolia (Mill.) Rehd.

Vitex agnus-castus f. rosea Rehd.

TRIESTE:

Verbena officinalis L.

Vitex agnus-castus L.

SICILY:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

CORSICA:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

MALTA:

Vitex agnus-castus L.

JUGOSLAVIA:

Vitex agnus-castus L. [Istria]

Vitex agnus-castus f. alba (West.) Rehd.

MOROCCO:

Vitex agnus-castus f. latifolia (Mill.) Rehd.

ERITREA:

Lippia adoensis Hochst.

BELGIAN CONGO:

Lippia callensi Moldenke*

NORTHERN RHODESIA:

Lantana kisi A. Rich.

SOUTHERN RHODESIA:

Priva cordifolia var. flabelliformis Moldenke

COMORO ISLANDS:

Clerodendrum putre Schau. [Comoro]

Clerodendrum speciosissimum Van Geert [Anjouan]

MADAGASCAR:

- Clerodendrum lastellei Moldenke*
Clerodendrum leandrii Moldenke*
Clerodendrum loniceroides Moldenke*
Clerodendrum mananjariense Moldenke*
Clerodendrum mandrareense Moldenke*
Clerodendrum manombense Moldenke*
Clerodendrum moremangense Moldenke*
Clerodendrum myricoides (Hochst.) R. Br.
Clerodendrum myrtifolium Moldenke*
Clerodendrum paucidentatum Moldenke*
Clerodendrum pauciflorum Moldenke*
Clerodendrum peregrinum Moldenke*
Clerodendrum perrieri Moldenke*
Clerodendrum perrieri var. laxicyosum Moldenke*
Clerodendrum perrieri var. macrophyllum Moldenke*
Clerodendrum premnoides Moldenke*
Clerodendrum putre var. subglabratum Moldenke*
Clerodendrum roseiflorum Moldenke*
Clerodendrum rubellum var. anomalum Moldenke*
Clerodendrum sakaleonense Moldenke*
Clerodendrum subtruncatum Moldenke*
Clerodendrum subtruncatum f. magnifolium Moldenke*
Clerodendrum sylvestre Moldenke*
Clerodendrum tubulosum Moldenke*
Clerodendrum villosicalyx Moldenke*
Clerodendrum vinosum Moldenke*

REUNION:

- Clerodendrum nutans Wall.
Clerodendrum serratum var. glabrescens Moldenke*

TURKEY:

- Vitex agnus-castus f. latifolia (Mill.) Rehd.
Vitex agnus-castus var. pseudo-negundo (Hauskn.) Bormm.

AFGHANISTAN:

- Vitex agnus-castus var. pseudo-negundo (Hauskn.) Bormm.

INDIA:

- Eriocaulon brownianum Mart. [Mysore]
Eriocaulon dalzellii Körn. [Mysore]
Eriocaulon edwardii Fyson is the correct orthography of this
 binomial
Eriocaulon fluitans Griff. is to be deleted
Eriocaulon gracile Mart. [Bombay]
Eriocaulon hamiltonianum var. minimum Fyson [Madras]*
Eriocaulon hamiltonianum var. minor Fyson [Assam]*

Eriocaulon quinquangulare L. [Bombay]

Eriocaulon robustum Steud. [Bombay]

Holmskioldia sanguinea Retz. [Mysore]

BURMA:

Eriocaulon gracile var. kurzii Fyson*

Eriocaulon quinquangulare var. martianum Wall.*

ANDAMAN ISLANDS:

Eriocaulon wightianum var. helferi Hook. f.*

CEYLON:

Eriocaulon quinquangulare var. walkeri Hook. f.*

CHINA:

Caryopteris incana (Thunb.) Miq. [Hunan]

Clerodendrum bungei Steud. [Hunan]

Clerodendrum cyrtophyllum Turcz. [Hunan]

KOREA:

Callicarpa shirasawana Mak.

Caryopteris divaricata (Sieb. & Zucc.) Maxim.

Caryopteris incana (Thunb.) Miq.

Verbena officinalis L.

Vitex trifolia var. simplicifolia Cham.

QUELPART ISLAND:

Callicarpa dichotoma (Lour.) K. Koch

Callicarpa japonica Thunb.

Callicarpa japonica var. luxurians Rehd.

Callicarpa japonica var. taquetii (Léveillé) Nakai

Callicarpa mollis Sieb. & Zucc.

Clerodendrum trichotomum Thunb.

Verbena officinalis L.

Vitex trifolia var. simplicifolia Cham.

JAPAN:

Vitex trifolia var. heterophylla (Mak.) Moldenke -- delete
the asterisk

FRENCH INDOCHINA:

Callicarpa baviensis Moldenke [Tonkin]*

Callicarpa longifolia Lam. [Tonkin]

Callicarpa poilanei Dop [Tonkin]

Clerodendrum serratum (L.) Moon [Tonkin]

Teijsmanniodendron peteloti Moldenke [Tonkin]*

FEDERATED MALAY STATES:

Teijsmanniodendron pteropodum (Miq.) Bakh. [Johore, Kedah, &
Pahang]

STRAITS SETTLEMENTS:

Teijsmanniodendron pteropodum (Miq.) Bakh. [Singapore]

PHILIPPINE ISLANDS:

Callicarpa erioclona Schau. [Bohol, Culi6n, & Panay]

Geunsia farinosa Blume [Balabac]

SIMALUR ISLAND:

Teijsmanniodendron pteropodum (Miq.) Bakh.

SUMATRA:

Eriocaulon thwaitesii Körn.Teijsmanniodendron simplicifolium Merr.Vitex koordersii H. J. Lam is to be deletedVitex venosa H. J. Lam is to be deleted

JAVA:

Eriocaulon thwaitesii Körn.

BRITISH NORTH BORNEO:

Teijsmanniodendron bogoriense Koord.Teijsmanniodendron glabrum Merr. is to be deleted

SARAWAK:

Teijsmanniodendron bogoriense Koord.

BORNEO:

Teijsmanniodendron glabrum Merr. is to be deletedVitex flabelliflora H. Hallier is to be deletedVitex koordersii H. J. Lam is to be deletedVitex tetragona H. Hallier is to be deleted

LESSER SUNDA ISLANDS:

Teijsmanniodendron ahernianum (Merr.) Bakh. [Banka]Vitex bankae H. J. Lam is to be deletedVitex bogoriensis H. J. Lam is to be deleted

MOLUCCA ISLANDS:

Teijsmanniodendron ahernianum (Merr.) Bakh [Obi]Teijsmanniodendron bogoriense Koord. [Amboina & Ceram]

NEW GUINEA:

Teijsmanniodendron ahernianum (Merr.) Bakh. [Northwestern
New Guinea & Schouten Island]Teijsmanniodendron bogoriense Koord. [Japen Island, Papua, &
Schouten Island]Xerocarpa avicenniaefoliola H. J. Lam is to be deleted

HAWAIIAN ISLANDS:

Lantana camara var. flava (Medic.) Moldenke [Kauai]

NEW CALEDONIA:

Vitex trifolia var. bicolor (Willd.) MoldenkeVitex trifolia var. heterophylla (Mak.) Moldenke

AUSTRALIA:

Lippia alba (Mill.) N. E. Br. [Queensland]

LOW ISLAND:

Avicennia eucalyptifolia Zipp.Avicennia marina var. anomala Moldenke*Avicennia marina var. resinifera (Forst.) Bakh.

TASMANIA:

Avicennia eucalyptifolia Zipp. is to be deleted

Avicennia marina var. anomala Moldenke is to be deleted

Avicennia marina var. resinifera (Forst.) Bakh. is to be deleted

CULTIVATED:

Aloysia virgata var. elliptica (Briq.) Moldenke [Argentina]

Clerodendrum nutans Wall. [Réunion]

Clerodendrum pyriformium J. G. Baker [Réunion]

Clerodendrum speciosissimum Van Geert [Comoro Islands]

Clerodendrum thomsonae Balf. f. [Chile & Madagascar]

Clerodendrum trichotomum Thunb. [Chile]

Clerodendrum trichotomum var. ferrugineum Nakai [Chile]

Clerodendrum umbellatum var. speciosum (Dombroin) Moldenke [Chile]

Duranta repens L. [Chile]

Laetana tiliaefolia Cham. [Chile]

Teijsmanniodendron ahernianum (Merr.) Bakh. [Java]

Verbena canadensis (L.) Britton [Georgia]

Vitex agnus-castus L. [Brazil]

Vitex bogoriensis H. J. Lam is to be deleted

Vitex triflora Vahl [Brazil & France]

ADDITIONAL NOTES ON THE ERIOCAULACEAE. V

Harold N. Moldenke

Explanation of the abbreviations used for the names of herbaria in which material hereinafter cited is deposited will be found in the previous installments of this series of notes in *Phytologia* 1: 309--336 (1939), 1: 343--364 (1939), 3: 178--192 (1949), and 3: 321--344 (1950). Additional abbreviations used in the present installment are Cn = University of Cincinnati, Cincinnati, Ohio; Cr = J. Carabia Herbarium, Havana, Cuba; Fn = Facultad Nacional de Agronomía, Universidad Nacional, Medellín, Colombia; Ll = Lloyd Library, Cincinnati, Ohio; and Wl = William Lucian Herbarium, Waterbury, Connecticut.

ERIOCAULON Gronov.

J. T. Mackay in his "Flora Hibernica", p. 288 (1836) places this genus in the Restiaceae (Restionaceae) and gives the etymology of the generic name as ερίον, wool, and καυλος, stem, in

allusion to the "downy stems of the species first known."

ERIOCAULON DECANGULARE L.

Literature references: Fernald, Rhodora 23: 92. 1921; Rouleau, Contrib. Inst. Bot. Univ. Montreal 54: 161 & 313. 1944.

The species is reported from Nova Scotia by A. W. H. Lindsay in Proc. & Trans. N. S. Inst. Nat. Sci. 4 (2): 184-222 (1877), but perhaps in error. Some two dozen Coastal Plain species are recorded by Lindsay from Nova Scotia. Some of these are backed by herbarium specimen vouchers, others have been collected there more recently, so it is a possibility that Eriocaulon decangulare may actually have been there in his time, too.

Additional citations: SOUTH CAROLINA: Greenville Co.: J. D. Smith s.n. [July 21, 1881] (Al). Sumter Co.: Holdaway 15 (H-42661). Williamsburg Co.: Godfrey & Tryon 509 (N). County undetermined: Herb. Butler Univ. 29923 (Bt). GEORGIA: Bacon Co.: W. H. Duncan 3987 (N). Brantley Co.: Pyron & McVaugh 307 (Gu-11083). Brooks Co.: McKellar s.n. [July 3, 1937] (Gu-15665). Bryan Co.: McKay s.n. [14 Aug. 1930] (N). Candler Co.: Pyron & McVaugh 728 (Gu-13144). Colquitt Co.: Kirkpatrick s.n. [Doe Run, 8-14-30] (Ga, Ga). Douglas Co.: Cronquist 5425 (Gu-30630). Early Co.: W. H. Duncan 4034 (N). Glynn Co.: W. H. Duncan 3721 (N). Johnson Co.: Pyron & McVaugh 3078 (Gu-18834). Lanier Co.: McKellar plant. no. 28 (Gu-15444). Lee Co.: W. F. Turner 65 (Mg). Liberty Co.: Grimm s.n. [7-20-43] (Cm). Lowndes Co.: Quarterman 1284 (Va). Miller Co.: W. H. Duncan 6758 (N). Richmond Co.: Cuthbert s.n. [May 1904] (Fl-5408). Screven Co.: W. H. Duncan 5545 (Gu). Spalding Co.: Bissell s.n. [Griffin, 9-9-40] (Ga, Ga); Riegel 203 (Ga, Ga, Ka). Turner Co.: W. H. Welch 1431 (Dp-2932). Ware Co.: J. S. Harper 66 (H-25564); McKellar plant. no. 38 (Gu-15477). Wilcox Co.: W. H. Rhoades s.n. [Abbeville, August 1925] (Or-23885, Ur), s.n. [Abbeville, August 1927] (N). County undetermined: Feay & Pond s.n. [Georgia] (Pa); B. B. Harris s.n. [South Georgia, 9-5-30] (Nt, Nt). FLORIDA: Alachua Co.: Arnold s.n. [Gainesville, 7/18/31] (Fl-5415). Brevard Co.: H. N. Moldenke 233 (Go, H-3036, Ur). Collier Co.: C. C. Deam 65414 (Dm, N), 66061 (N). Columbia Co.: Rolfs 893 (Fl-5412). De Soto Co.: E. West s.n. [Lacy, 23 Sept. 1938] (Fl-494). Duval Co.: Curtiss 3016 (Cm, Pa), 5060 (Es), 5690 [June 24, 1896] (Al, Fl-5416, Ka, Po-185871, Ur), 5690 [Aug. 21, 1896] (Al, Fl-5416, Ka, Po-185871, Ur); Rolfs 877 (Fl-5414); C. Skottsberg s.n. [12/5/1935] (Go). Escambia Co.: M. Morgan s.n. [Pensacola, August 8, 1941] (I). Franklin Co.:

Saurman s.n. [Apalachicola, 1867] (Pa). Hendry Co.: C. C. Deam 60694 (Dm, Dm, N). Lake Co.: A. S. Hitchcock s.n. [Eustis, June & July 1894] (Fl--5413, Ka); Nash 535 (Es), 847 (Es), 1722 (Es). Lee Co.: C. C. Deam 65699 (Dm); A. S. Hitchcock s.n. [Myers, July--Aug. 1900] (Ka). Liberty Co.: West & Arnold s.n. [Bristol, 22 July 1940] (N). Manatee Co.: Tracy 7587 (Cm, Es). Marion Co.: O'Neill s.n. [Ocala National Forest, Sept. 12, 1929] (Fl--5405). Okeechobee Co.: Fennell & Jones 933 (H--68628); W. S. Phillips s.n. [July 7, 1940] (Bu). Osceola Co.: Singletary 162 (H--46213). Palm Beach Co.: Muenschler & Muenschler 14031 (N). Pinellas Co.: S. M. Deam 2846 (Dm); B. H. Patterson s.n. [Jan. 8, 1918] (Cm); M. H. Williams s.n. [St. Petersburg, Feb. 24, 1926] (H--25660). Polk Co.: McFarlin 3311 (Gg--242791), 5652 (Du--254112), 6216 (Au); P. O. Schallert s.n. [7/27/40] (Bt--53894, Gg--316195, Or--43095). County undetermined: Burger & West 76 [Richloam] (Fl--5410, Fl--5411); A. W. Chapman s.n. [S. Fla.] (Du--91848). ALABAMA: Baldwin Co.: Tracy 8043 (Au). Mobile Co.: C. F. Baker s.n. [Mobile, 7/20/1897] (Ka); Mackenzie 4051 (Dm). Washington Co.: Munz 1481 (Po--121650). MISSISSIPPI: Hancock Co.: Correll & Correll 9111 (H--71756); Degener & Park 5190 (Ms). Harrison Co.: Tracy 3428 (Dm). Jackson Co.: A. B. Seymour 16 (H--65761), 9199 [Seymour & Earle 16] (Gg--188743, Ur); Skehan 22467 (Ur). LOUISIANA: Natchitoches Par.: Correll & Correll 9788 (H--71736), 9960 (H--71752); E. J. Palmer 7981 (Gg--183014, Mg). Saint Tammany Par.: Langlois s.n. [near Covington, April 1879] (Ba). Tangipahoa Par.: Correll & Correll 9316 (H--71757). TEXAS: Anderson Co.: LeSueur & Smith s.n. [7/7/35] (Au, N), s.n. [7/7/38] (Au). Austin Co.: Tharp 44347 (N), 44348a (N), s.n. [6/28/42] (Al, Au, Gg--316994, N, N, Va). Freestone Co.: G. W. Goldsmith s.n. [6/15/41] (Au, Au). Hardin Co.: Parks & Cory 19720 (Tr); Tharp s.n. [Sourlake, July 20, 1929] (Au, Au), s.n. [Kountze, 7-21-42] (Au, N). Henderson Co.: B. B. Harris s.n. [8-6-27] (Nt, Nt); Tharp 2880 (Au). Houston Co.: Warner s.n. [Grapeland] (Hu). Jasper Co.: G. L. Fisher 32101 (Au, Au). Jefferson Co.: Mrs. Smith s.n. [Beaumont, July '15] (Au). Newton Co.: Tharp 44342 (Au, N). Robertson Co.: F. A. Barkley 13034 (Al, N, N). Rusk Co.: Vinzent 47 (Br). Smith Co.: J. Reverchon 2766 (Po--186009), 4359a (Po--186010). Tyler Co.: Tharp 44345 (Au, N). Waller Co.: E. Hall 675 (Pa, Po--119240, Pr, Ur). County undetermined: Warner s.n. (Hu). LOCALITY OF COLLECTION UNDETERMINED: A. W. Chapman s.n. [Southern Flora] (Pr); Herb. Chapman s.n. [Southern Flora] (Ms); Oyster s.n. [North Am., July

19, 1881] (Gg--105478); J. Torrey s.n. (Br).

ERIOCAULON SCLEROCEPHALUM Ruhl.

The species is mentioned by Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47 & 114 (1946) and described as being endemic to Pinar del Río and Isla de Pinos. A cheironymous synonym is Eriocaulon scleriocephalum Ruhl. The plant grows in white siliceous sand of savannas, blooming in February.

Additional citations: ISLA DE PINOS: Carabia 1152 (Cr, N); León 17485 (N); León & Seifriz 17485 (Ha).

ERIOCAULON SEEMANNII Moldenke

This rare species has been found recently in a marsh in the vicinity of Juan Franco racetrack near Panamá, where it is described as being scarce. It ascends to 1500 m. altitude in Honduras. It blooms in November and December, and has been confused with E. schiedeanum Körn.

Additional citations: HONDURAS: Morazán: Molina R. 1740 (H). PANAMA: Panamá: P. C. Standley 27821 (H--1153947); Woodson, Allen, & Seibert 1650 (H).

ERIOCAULON SELLOWIANUM Kunth

Literature references: Ruhl. in Engler, Das Pflanzenr. 4 (30): 51. 1902; Chodat & Hassler, Bull. Herb. Boiss., ser. 2, 3: 1033--1034 [Plant. Parag. 2: 256]. 1903; Malme, Arkiv Bot. 26A (9): 7. 1935; Castellanos in Descole, Gen. & Sp. Pl. Argent. 3: 85--86. 1945.

Illustration: Descole, Gen. & Sp. Pl. Argent. 3: pl. 16. 1945.

Additional citations: PARAGUAY: Fiebrig 5696 (W--1312946).

ERIOCAULON SEPTANGULARE With.

Additional literature references: J. T. Mackay, Fl. Hibernica 288. 1836; Robinson & Fernald, Rhodora 11: 40, 41, & 240. 1909; Eames, Rhodora 11: 91. 1909; Collins, Rhodora 11: 129. 1909; Fernald, Rhodora 13: 117, 135, & 260. 1911; Fernald, Rhodora 23: 102. 1921; Peattie, Rhodora 24: 61 & 248. 1922; Fernald, Rhodora 24: 186. 1922; Louis-Arsene, Rhodora 29: 209 & 259. 1927; Svenson, Rhodora 29: 113. 1927; Taylor & Fogg, Rhodora 29: 163. 1927; Arsene, Rhodora 29: 131. 1927; Fogg, Rhodora 32: 149, 150, 172, 213, 242, & 289. 1930; H. S. Peppoon, Chicago Acad. Sci. Bull. 8: 1--554. 1927; Perry, Rhodora 33: 113, 118, & 251. 1931; Fernald, Rhodora 33: 39. 1931; Fassett, Rhodora 33: 73. 1931; Fassett, Rhodora 35: 387 & 414. 1933; Fernald, Rhodora 35: 5. 1933; Fassett, Rhodora 36: 350. 1934; Fassett, Man. Aquat. Pl. 13, 16, 17, 169, & 170. 1940; J. O. Swift, New York World Telegram Sept. 27, 1941; Fernald, Rho-

dora 43: 209 & 211. 1941; Fernald, *Rhodora* 44: 244, 245, & 496. 1942; E. V. Wulff [trans. Brissendero], *Introd. Hist. Pl. Geog.* 82, 84, & 211. 1943; Potzger, *Trans. Wisc. Acad. Sci.* 35: 142. 1943; Rouleau, *Contrib. Inst. Bot. Univ. Montréal* 54: 129, 135, 148, 161, 178, 182, 191, 196, 207, 222, 233, 235, 265, & 313. 1944; G. N. Jones, *Fl. Illinois* 88. 1945; A. C. Martin, *Am. Midl. Nat.* 36: 533, pl. 4. 1946; Tatnall, *Fl. Del.* 75. 1947; Ogden, Steinmetz, & Hyland, *Bull. Josselyn Bot. Soc.* 8: 20. 1948; E. J. Alexander, *Journ. N. Y. Bot. Gard.* 50: 56. 1949.

Additional synonyms: *Eriocaulon articulatum* var. *submersum* Haberer, *E. decangulare* Lightf., *E. septangulare* Amer. auct., *E. septangulare* (Huds.) Morong, *E. septangulare* Kunth, *E. septangulare* Wiss., and *E. 7-angulare* With.

Illustrations: N. C. Fassett, *Man. Aquat. Pl.* 13, 17, & 170, fig. 24. 1940; A. C. Martin, *Am. Midl. Nat.* 36: 533, pl. 4. 1946.

The common name "seven-angled pipewort" is recorded by J. Torrey and "jointed pipewort" by Mackay, while "pipewort" is recorded by Alexander, G. B. Grant, B. H. Patterson, and J. Dwyer on herbarium labels. Some Minnesota and New York specimens of this plant have been mis-identified in herbaria as *E. decangulare* L., some New Jersey specimens as *E. compressum* Lam., some New York and New Jersey specimens as *E. gnaphalodes* Michx., and a New Hampshire specimen as *Lachnocaulon* sp. It has been collected at 830 feet altitude in New Hampshire and at 2016 feet in Guilder Pond in the Mount Everett Reservation, Berkshire County, Massachusetts. The specimens cited below were collected in anthesis in May and from July to October, inclusive. The collectors describe the habitat of the plant as follows: shallow water, in mud at edge of pond, ponds, boggy shores, bogs, peaty shores, in soft muck along shore, sandy swamps and sloughs, shallow water in sand, lakelet, shallow ponds, sandy borders of lakes, deadwaters of streams, dry ditch, sandy swamp, wet sandy ground, moist shore, shallow pools, lake shores, in muddy soil associated with buttonbush and swamp milkweed, on cement blocks jutting out of water, in sphagnum beds, river borders, mud flats of rivers, damp mud of wet shores, water holes in open peatbogs, and pond shores.

Swift, in the reference cited above, describes the plant very quaintly "under the pickerelweed and Labrador tea, fly honeysuckle and pitcher plants, grows the delicate, queer little water-bog dweller, pipewort, *Eriocaulon articulatum*, like tiny lead-white golf balls on the ends of sticks. They look like little war clubs, three inches to a foot tall." Ogden, Steinmetz, and Hyland, in the reference also cited above, record the species from Androscoggin, Aroostock, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscata-

quis, Somerset, Waldo, Washington, and York Counties, Maine.

Lakela 3092 at New York is very immature; Jansson s.n. [July 5, 1930] at the Bailey Hortorium is also very immature and resembles E. parkeri, but its heads appear as if they were going to become more white-hairy. Blake 10964 in the Dudley Herbarium was identified as E. parkeri, but seems to be far too white-pubescent to be that species; Long & Bartram 1387 at the Philadelphia Academy seems almost like an especially hairy form of E. parkeri. For a discussion of many other specimens intermediate between this species and E. parkeri see my discussion of the latter species in Phytologia 3: 337--338 (1950). Additional intermediate specimens annotated as E. septangulare by me are W. M. Canby s.n. [near Holly Oak, Sept. 1862] in the New York College of Pharmacy herbarium, Haught 1088 at Morgantown, H. L. Stewart s.n. [Sylvan Beach, Aug. 16, 1888] at Pomona College, and F. M. Hexamer s.n. [17 Aug. 1855] at Brussels. It is worth noting that in almost all cases these intermediate specimens have been collected with or in close proximity to typical material of E. septangulare and of E. parkeri and therefore a hybrid origin is not precluded.

I am indebted to the late Brother Marie-Victorin and his associates for the following additional list of Quebec specimens of E. septangulare, presumably deposited in his own herbarium: Brome Co.: Cléonique-Joseph s.n. [Lac Brome], s.n. [Lac St. Louis]. Labelle Co.: Adrien 3308 [Lac Montjoie, août 1930]; M. Raymond s.n. [Lac Tibériade, août 1932]. Lévis Co.: Rouleau 1294 [Nouveau-Liverpool, 9 août 1936]. Portneuf Co.: Marie-Victorin, Rolland-Germain, & Meilieur s.n. [Lac Upica, 27 juillet 1935]. Maskinonge Co.: M. Raymond s.n. [Lac Long, août 1941], s.n. [Lac Traverse], s.n. [Lac Sassisinagog]. Missisquoi Co.: M. Raymond s.n. [Philipsburg on Lake Champlain, July 1941]. Papineau Co.: Cléonique-Joseph s.n. [Lac St. Pierre], s.n. [Lac des Deux Montagnes], s.n. [Lac Pike], s.n. [Lac Bigelow], s.n. [Lac Riopel], s.n. [Lac Clay]. Saint Jean Co.: M. Raymond s.n. [St.-Blaise on Richelieu River, July 1934]. Saint Maurice Co.: Cléonique-Joseph s.n. [Lac des Îles], s.n. [Lac Chrétien], s.n. [Lac Perchaude].

Wulff, in the reference cited above, lists 13 chief types of discontinuous areas of plant distribution, and in his second or "North Atlantic" type he places plants distributed in North America and Europe (including the British Isles) and divided into two sections by the northern part of the Atlantic Ocean. Some of the species in this group, he says, are found also in isolated spots in Asia, including eastern Asia. Exceptionally inter-

esting examples of this type, he says, are the areas of species found only in Ireland and North America, such as E. septangulare and Spiranthes romanzoffiana. On page 84 he gives a line map of the distribution of our species. He cites Troll who in 1920, in his study of the 6 types of oceanic elements in the European flora (groups of species adapted to conditions of a humid maritime climate), places our species in his first or "Eu-oceanic Atlantic" or "hyper-oceanic" type along with Asplenium marinum and Spiranthes romanzoffiana. Wulff, of course, is not quite correct in saying that our species is limited to Ireland and North America, for it occurs also in Scotland and on the Isle of Skye.

Potzger, in the reference cited above, records the species from the primeval forest around Trout Lake, Vilas County, Wisconsin (Potzger 9112). The Brewer & Chickering s.n. from Island Pond, Vermont, at Pomona College, has a specimen of Syngonanthus flavidulus (Michx.) Ruhl. mounted with it, but this apparent belongs on the previous sheet (no. 186011), collected by Ellis at Alexander, Georgia, on which there is mounted a piece of the E. septangulare collection of Brewer & Chickering.

The illustration cited at the end of the list of herbarium specimens below, made by Mrs. Chase, consists of 14 figures in drawing, excellently done, and bears this note "I doubted (do yet) that our 'septangulare' is the same as that of Brit. Isles, but I never got around to working it out." There is also a drawing by Mrs. Chase attached to Praeger s.n. [near Roundstone, W. Galway, 17.7.95] at Oregon State College.

E. J. Hill reports for his no. 146.1875 and s.n. [Laporte, July 22, 1875] that the scapes are 6- to 8-striate, while Dwyer on his no. 2443 says they are apparently 7-angled; Leggett s.n. [Ridgefield, July 31, 1880] has a note on its label stating "scape six-striate". W. S. Moffatt placed an interesting comment on his no. 162.1899 from Schoolcraft County, Michigan, taken from his collector's notebook: "Fits description of E. compressum Lam. much better than E. septangulare, but range of former is given as Southern N. J. to Fla. and Tex."

M. McKee reports on the label of her no. 1792 that E. septangulare is a "local pest" in Lake Chargoggagoggamanchauggagoggchaubunagungamaugg at Webster, Worcester County, Massachusetts. It would seem to me that no plant could be a greater nuisance at this locality than the name of the lake! Mackay in the reference cited above states that it grows abundantly in lakes at Cunnamara, Ireland, "where it was first observed by Doctor Wade", flowering in August, the "roots creeping and throwing out innumerable, white curiously articulated fibres, which penetrate deep into the mud."

Bassler 3017 and H. L. Stewart s.n. [Sylvan Beach, Aug. 16, 1888] have specimens of this species mixed with E. compressum, and S. F. Blake 10964 with E. parkeri, while Adrien 3308 and B. H. Patterson s.n. [N. E. Harbor, July 28, 1894] has it mixed with Lobelia dortmanna. L. F. C. Gates 11119a is the deep-water form.

G. N. Jones, in the reference cited above, lists the species as a member of the Illinois flora on the basis of the statement by Pepoon, who says "....from East Chicago eastward". Jones, however, admits that he has seen no Illinois specimens to substantiate this. Fassett, in his Manual of Aquatic Plants, page 169, says that it grows on "sandy shores of soft water lakes with stems erect and seldom more than 10 cm. tall, or in water up to 2 m., the rosettes forming green patches on the bottom and the stalks elongating so that the heads are at the surface."

The Nichols s.n. [Sept. 14, 1911] at Montreal has a very anomalous detached head which is not compressed and only very slightly villous. Carson s.n. [Quaker Bridge, 183-] at the Lloyd Library is also anomalous, being a rather large, gray-headed, rather thick form. Muenschler & Curtis 6809 looks much like E. compressum, as does also W. Stone s.n. [Aug. 7, 1901] at Stillwater. Grout s.n. [Hollis, Aug. 4, 1892] has peduncles 78 cm. long.

The specific part of the binomial is sometimes written with a capital initial letter, for no good reason. Canby s.n. at the Dudley Herbarium is mixed with E. parkeri, as is also A. P. Garber s.n. [Mogothy River, Aug. '67] at Philadelphia, which is only a bit more hairy. The endosperm morphology of E. septangulare is described by Martin in the reference cited above. Tatnall, also in the reference given above, lists the species from New Castle Co., Delaware. The Anselm 435 cited previously by me as from an undetermined county in Quebec is actually from Brome County.

Additional citations: NEWFOUNDLAND: B. W. Brooks s.n. [Whitbourne, 8/9/37] (Cm); Fernald, Wiegand, & Kittredge 2971 (Du--80986); Jansson s.n. [July 5, 1930] (Ba), s.n. [July 15, 1930] (Mg); C. S. Williamson 461 (Cm, D--824257, in part). PRINCE EDWARD ISLAND: Fernald, Long, & Saint John 7128 (Pl--57783, Vi). NOVA SCOTIA: Cape Breton Co.: Macoun 20763 (Po--185878); Rousseau 35599 (Mg). Guysboro Co.: Faribault 1908 (Mg). Halifax Co.: Prince & Atwood 510 (Du--222529); Rousseau 35295 (Mg), 35296 (Mg). Pictou Co.: H. Saint John 1403 [Herb. Marie-Victorin 12956] (Du--121125, Gg--105738, Vi). Richmond Co.: Rousseau 35579 (Mg). Saint Paul Islands: Perry & Roscoe

127 (Mg). Shelburne Co.: Macoun 22639 (Cm, Ob--23881). Victoria Co.: Senn 1550 (N). NEW BRUNSWICK: Kent Co.: J. Fowler s.n. [Aug. 12, 1869] (Pa). Saint John Co.: J. Fowler s.n. [St. John, Aug. 4, 1877] (Cm). Westmoreland Co.: Marie-Victorin, Rolland-Germain, & Jacques 44821 (Mg). QUEBEC: Bellchasse Co.: Rousseau 22073 (Mg, Mg, Vi). Gaspé Co.: Marie-Victorin, Rolland-Germain, & Jacques 44547 (Mg, Ob--89434), 44903 (Mg); Proulx 68 (N). Gatineau Co.: G. H. M. Lawrence 572 (Ba); Rolland-Germain 15737 (Mg, Mg, Pl--91625); Senn 1860 (N). Iberville Co.: Marie-Victorin & Rolland-Germain 45679 (Mg). Joliette Co.: Gauthier 544 (Mg). Labelle Co.: Adrien 3308 (Mg); Marie-Victorin, Rolland-Germain, & Brunel 45601 (Mg). Lac Saint-Jean Co.: Marie-Victorin 15736 (Po--127329). Megantic Co.: Fernald & Jackson 12048 (Vi); Marie-Victorin 11324 (Mg, Vi). Mistassini Region: Dutilly & Lepage 11341 (I). Montcalm Co.: Marie-Jean-Eudes 645 (Mg), 646 (Mg); F. W. Pennell 16704 (Mg); Roy 123 (Mg), 521 (Mg). Montmorency Co.: Marie-Victorin, Rolland-Germain, & Meilleur 43069 (Mg). Pontiac Co.: Dansereau & Desmarais 4,408010261 (Al). Portneuf Co.: Marie-Victorin 615 [Herb. Marie-Victorin 6516] (Vi), 11259 [Herb. Univ. Montréal 429; Herb. Marie-Victorin 25207] (Al, Mg, Pl--91897, Ur, Vi). Quebec Co.: Marie-Victorin 15735 (Vi), 15746 (Mg). Rimouski Co.: C. S. Williamson 1106 [1] (D--824257, in part). Roberval Co.: Marie-Victorin 15736 (Mg, Mg). Saguenay Co.: H. Saint John s.n. [Herb. Geol. Surv. Canada 90285; Herb. Marie-Victorin 55543] (Vi). Terrebonne Co.: Boardman 36 (Cm), 281 (Cm), 321 (Cm); Marie-Victorin 707 (Vi), s.n. [août 1907] (Go), s.n. [Lacs de Laurentides, Août 1912] (Mg). Yamaska Co.: Marie-Victorin, Rolland-Germain, & Meilleur 45208 (Mg). ONTARIO: Algoma Co.: Fassett 44699 (Mg); Taylor, Hosie, Fitzpatrick, Losee, & Leslie 1339 (Mg). Hastings Co.: Macoun s.n. [Belleville, July 14th, 1865] (Pa), s.n. [Belleville, July 12th, 1865] (Ms). Muskoka Co.: P. Cook s.n. [Arma Is., Lake Joseph, 8/2/31] (Cm); G. L. Fisher s.n. [Dorset & St. Thomas, Aug. 5th, 1898] (Ob--23911); W. R. Hamilton s.n. [Sparrow Lake, Aug. 1900] (Cm); B. H. Patterson s.n. [Lake Muskoka, Aug. 24, 1902] (Cm), s.n. [Lake Muskoka, Aug. 28, '02] (Cm); Topping s.n. [Mortimer's Point, Lake Muskoka, August 1899] (Mg). Sunbury Co.: Grassl 2082 (N). County undetermined: R. F. Cain 539 [Spawning Lake, L. Temagami] (Bt--16687). ISLE ST. IGNACE [Thunder Bay Co., Ontario]: O. B. Wheeler s.n. [August 1866] (Pr). MAINE: Androscoggin Co.: Carpenter s.n. [Turner, 12 July 1938] (Vt). Franklin Co.: L. O. Eaton s.n. [South

Chesterville, Aug. 1899] (Ur), s.n. [S. Ches., Aug. 1901] (Ur). Hancock Co.: Friesner 3399 (Bt--7502, Du--291759, Ka--84715); B. H. Patterson s.n. [N. E. Harbor, July 28, 1894] (Cm, Cm). Lincoln Co.: Grover s.n. [July 20, 1921] (Ob--82553). Oxford Co.: F. W. Johnson 125 (Ur); Parlin s.n. [Hartford, Aug. 1893] (Ob--23906), s.n. [Hartford, Sep. 1, 1893] (Ob--23903); J. F. Reed 488 (H--29054); L. A. Wheeler s.n. [8/5/29] (St--3290). Penobscot Co.: Briggs s.n. [Chemo Pond, Aug. 1891] (Ur). Somerset Co.: G. B. Grant 753 [899; 2630] (Po--267397). Waldo Co.: Fernald & Long 13162 [Herb. Marie-Victorin 31996] (Ur, Vi); Friesner 4840 (Bt--9752), 9094 (Bt--28844), 10224 (Bt--32896, Cm, Gg--276703, Gu--14860, H--41002, Pl--83509, St--3291, Ur, We), 14054 (Fn--318, Gg--276707). Washington Co.: C. H. Knowlton s.n. [Aug. 6, 1936] (Bt--33725). County undetermined: R. Campbell 5035 (H--9656); Towle s.n. [Maine] (Pa). NEW HAMPSHIRE: Belknap Co.: L. A. Carter 181 (Ur, Ur), s.n. [East Lilton, July 20, 1899] (Ur, Ur), s.n. [Gilford, July 17, 1902] (Ur); F. C. Seymour 3617 (H--65749). Carroll Co.: W. V. Brown s.n. [Lake Ossipee, July 21, 1938] (H--64214), s.n. [Lake Ossipee, July 22, 1938] (H--63357); Bumstead s.n. [North Conway, Aug. 18/15] (Ms), s.n. [Aug. 1865] (Gg); Grover s.n. [Ossipee, July 8, 1891] (H--9660, Ob--23904), s.n. [Aug. 1891] (Ob--23905); Keneth Wagner 1072 (Dp--38203). Cheshire Co.: Deane s.n. [Frost Pond, East Jaffrey, July 18, 1889] (Ur), s.n. [border of Jaffrey Pond, July 2, 1891] (Ur), s.n. [Jaffrey, Aug. 7, 1891] (Ur), s.n. [muddy border of brook, Jaffrey, July 28, 1898] (Ur); C. S. Plumb s.n. [Chesterfield, August 10, 1880] (Ms). Grafton Co.: H. S. Adams s.n. [edge of Squam Lake, Aug. 14, 1896] (Ur); J. F. Reed s.n. [Oct. 2, 1931] (H--27443). Hillsboro Co.: F. S. Beattie s.n. [Pelham, July 14, 1927] (Or--21032); Grout s.n. [Hollis, Aug. 4, 1892] (Vt). Merrimack Co.: Cowie s.n. [H. N. Moldenke 19505] (N); Day s.n. [Aug. 15, 1903] (Gg--105739). Rockingham Co.: Sanborn 1729 [East Epping] (Ur). County undetermined: H. C. Beardslee s.n. [New Hampshire] (Ob--77962). VERMONT: Addison Co.: Boyce 3018 (H--65748); C. N. Brainerd s.n. [Aug. 16, 1878] (Vt), s.n. [Sept. 26, 1895] (Vt), s.n. [Sept. 19, 1896] (Vt); Dutton s.n. [Salisbury, 8/21/06] (Vt), s.n. [Sept. 5, 1927] (Va, Vt, Vt, Vt); E. J. Hill s.n. [Salisbury, 8-12-1880] (Se--4194); M. Hitchcock s.n. [Salisbury, August 15, '79] (Cm). Chittenden Co.: Hinsdale s.n. [28 July 1893] (Cb--23917). Essex Co.: Brewer & Chickering s.n. [Island Pond, Aug. 1859] (Po--186012). Grand Isle Co.: Dike s.n. [shore of Grand

Isle, August 28] (Vt); Flynn s.n. [So. Hero, Aug. 6, 1919] (Vt). Rutland Co.: Kent s.n. [Wallingford, 1895] (Vt). Windham Co.: Dobbin 1304 (Al); Dole s.n. [Marlboro, June 28, 1939] (Vt); Grout s.n. [Marlboro Pond, July 14, 1894] (Vt); Miss Steward s. n. [Londonderry] (Vt). Windsor Co.: Miss Steward s.n. [Tyson, 8/6/16] (Vt). County undetermined: C. C. Frost s.n. (Ms); Oyster 3018 (Gg--105733, in part). MASSACHUSETTS: Barnstable Co.: Bacigalupi 2113 (Du--208975, Po--267596); C. N. Brainerd s.n. [July 16, 1878] (Cm, Vt); Churchill s.n. [Tyannis, July 4, 1896] (Ur); M. T. Cook s.n. [Falmouth, 7-15-99] (Dp--2935, in part); Degener 463 (N), 464 (N, N); T. W. Edmondson 2216 (N); Laird 24.1.3 (Ms); Mye s.n. [Sandwich, July 1876] (Ms); E. J. Wheeler s.n. [Falmouth, Aug. 1907] (Al); Wiggins 8842 (Du--283032). Berkshire Co.: Ericson s.n. [Moldenke & Moldenke 11708] (Go, N); H. N. Moldenke 13510 (Ec); W. A. Weber 1529 (Bl--48770). Bristol Co.: W. R. Dudley s.n. [New Bedford, 1874] (Du--71433). Dukes Co.: F. C. Seymour 1139 (Gg--105736, H--65753, Se--4004). Essex Co.: Collector undesignated s.n. [Salem] (D--824261, in part). Franklin Co.: H. C. Beardslee, Jr., 21117, in part [Leverett] (Ob--94490), 21117, in part [Shutesbury] (Ob--94490); Ewer s.n. [July 4, 1928] (Ms, Ms); Goodale, Markert, & Piper 55835 (H--65755); F. C. Seymour 2468 (H--65752); R. E. Torrey s.n. [Leverett Pond] (Ms), s.n. [Leverett, Sept. 1920] (Ms); L. S. Woodworth s.n. [July 18, 1921] (Ms). Hampden Co.: Bliss & Seymour G.832 (H--65756, in part), G.832a (H--65756, in part); F. C. Seymour 268 (H--65757, Ms), G.1042a (H--65756, in part); R. E. Torrey s.n. [7-8-1911] (Ms). Middlesex Co.: W. E. Andrews s.n. [Melrose, 7/11/91] (Ur, Ur), s.n. [Spot Pond, 7/8/92] (Ur); Beattie s.n. [Tyngsboro, July 25, 1927] (Nt), s.n. [Tyngsboro, 1927] (Nt), s.n. [Willowdale, Tyngsboro] (Po--146337); Morong s.n. [Ashland, Aug. 13, 1878] (Ur); H. Saint John 812 (Pl--63975); F. C. Seymour s.n. [Waltham, June 25, 1908] (H--65751, in part), s.n. [Pepperell, July 11, 1908] (H--65751, in part); E. S. Steele s.n. [Concord, Aug. '83] (Ob--23913); Underwood & Seymour s.n. [Oct. 4, 1890] (H--65750). Nantucket Co.: Deane s.n. [Washing Pond, Sept. 7, 1885] (Ur), s.n. [Reed Pond, Sept. 7, 1885] (Ur); Jennison s.n. [Nantucket, 8/16/09] (Ms); F. W. Pennell 11153 (Mg). Norfolk Co.: Churchill s.n. [S. Weymouth, July 4, 1899] (Ba); Dascomb s.n. [W. Brooklyn, Aug.] (Ob--23916); Herb. Mass. Agr. Coll. s.n. [Milton, Aug. 10, 1909] (Ms). Plymouth Co.: S. F. Blake 10964, in part (Du--193859, Po--196391, in part); F. C. Seymour 1134

(H--65754, in part), 4341 (H--65754, in part). Suffolk Co.: L. H. Bailey s.n. [near Boston, Aug. 1, 1883] (Ba, Ur); Collector undesignated s.n. [Boston, 1830] (Du); F. F. Forbes s.n. [West Roxbury, Sept. 2, 1900] (Ur). Worcester Co.: M. McKee 1792 (Dp); Stephens s.n. [July 1888] (Ob--23915). County undetermined: Morong s.n. [eastern Mass., July 1879] (Du--90823); Plumb s.n. (Vt); Ravenel s.n. [Mass.] (Pr); R. E. Torrey s.n. [Locks Pond, Jul. 16, 1910] (Ms), s.n. [Lake Wyola, Sept. 13, 1916] (Ms). RHODE ISLAND: Washington Co.: Carpenter s.n. [Hope Valley, Aug. '06] (Vt). County undetermined: W. W. Bailey 25 [1878, 3018] (Cm); Calber s.n. [1846] (Du--54391). CONNECTICUT: Litchfield Co.: Dwyer 2443 (N), 2663 (N, N); L. S. Slater s.n. [Sept. 15, 1923] (Al). New London Co.: Enequist 306 (N); Jansson s.n. [July 12, 1929] (Au); Lumsden s.n. [July 29, 1883] (Ob--23907); Nichols s.n. [Sept. 14, '91] (Mg); W. A. Setchell s.n. [Norwich, July 11, 1885] (Ka), s.n. [Preston, July 11, 1885] (Pr). Tolland Co.: G. S. Torrey 1018 (Bt--30781). Windham Co.: Enequist 222 (N). NEW YORK: Albany Co.: H. D. House 21977 (Al). Cayuga Co.: E. Cannon s.n. [Aug. 10, 1888] (Gg--105753). Chautauqua Co.: McVaugh & Curtis 7236 (Al); W. V. Metcalf s.n. [Aug. 16, 1887] (Ob--23914, We); B. H. Patterson s.n. [Chautauqua, Aug. 11, 1887] (Cm, Cm), s.n. [Chautauqua, Sept. 6, 1910] (Cm). Chenango Co.: H. L. Stewart s.n. [Sylvan Beach, Aug. 16, 1888] (Po--186013). Clinton Co.: Redfield s.n. [Upper Au Sable, July 19, 1870] (Pr). Columbia Co.: McVaugh 1324 (Al), 2011 (Al), 2063 (Al). Dutchess Co.: McVaugh 3875 (Al); F. W. Pennell 8400 (D--732386), 8431 (D--732361). Essex Co.: C. N. Brainerd s.n. [Bulwaga Bay, Sept. 19, 1899] (Vt); J. S. Harper 107 (Al, Mg); H. D. House 7249 (Al), 14921 (Al), 15170 (Al), 15192 (Al, Mg, Vi), 26854 (Al), 26913 (Gg--276706), s.n. [Sept. 7, 1917] (Al); C. H. Peck s.n. [Lake Placid] (Al); Whitney 2198 (Al). Franklin Co.: Rowlee, Wiegand, & Hastings s.n. [July 11, 1899] (N); Volz s.n. [July 19, 1936] (Al). Fulton Co.: Banker 1382 (N); Haight 1088 (We). Hamilton Co.: Haberer s.n. [July 1879] (Al); H. D. House s.n. [October 4, 1926] (Al); B. B. Lambert 2 (Mg). Herkimer Co.: Haberer 1011b (Al), s.n. [North Lake, July 1902] (Al); H. D. House 6708 (Al), 17998 (Al); Killip 958 (Cm), s.n. [Mountain Pond, Aug. 11, 1916] (Po--186032); Woolcott s.n. [North Lake, Aug. 1891] (Al). Nassau Co.: E. P. Bicknell 230 (D--735447); Muenschler & Curtis 6809 (Al); P. Wilson s.n. [Merri-
 rick, Sept. 11, 1915] (Al). Oneida Co.: Haberer 1011 (Al), 2739 (Al), s.n. [Forestport, 7-25-1904] (Al); H. D. House s.n. [Aug.

9, 1917] (Al). Onondaga Co.: W. R. Dudley s.n. [1885] (Du—71425); K. M. Wiegand 6130 (Au). Orange Co.: J. H. Barnhart 1176 (N); Muenschler & Curtis 5607 (Al); J. Torrey s.n. [West Point] (Br). Oswego Co.: Clausen & Hinkey 4382 (Al, Ba, N), 4383 (Al, N); W. R. Dudley s.n. [Aug. 4, 1891] (Du—75270); Hotchkiss 3397 (Al); H. D. House 5822 (Al); W. W. Rowlee s.n. [Aug. 4, 1891] (Pl—86408); C. S. Sheldon s.n. [Aug. 27, 1877] (Al), s.n. [4 Sept. 1882] (Ob—23910). Rensselaer Co.: W. E. A. Aiken s.n. [Troy] (D—781693); H. D. House 21951 (Al), 24239 (Al); C. H. Peck s.n. [Sand Lake] (Al); Puissant s.n. [Poestenkill] (Br); Rousseau s.n. [Troy] (Ob—23912). Rockland Co.: Muenschler & Curtis 5608 (Al). Saint Lawrence Co.: M. C. Carter s.n. [Aug. 22, 1891] (Al); H. D. House 20701 (Al); W. A. Matthews 2964 (Gg—276704). Saratoga Co.: H. D. House 26043 (Al); McCombs 12a (Cm); O. P. Phelps s.n. [July 17, 1927] (Al). Schenectady Co.: H. D. House 5280 (Al). Schuyler Co.: Barbour 385 (Ka); McVaugh & Curtis 7465 (Al). Steuben Co.: Lucy 1159 (Al). Suffolk Co.: L. H. Bailey s.n. [Lake Ronkonkoma, Aug. 5, 1919] (Ba); S. A. Cain 325-4 (Bt—22754); Clute 116 (Bt—3854); Gershoy s.n. [July 13, 1919] (Ob—61421); H. W. Graham s.n. [Deer Pond, July 1926] (Cm); L. K. Henry s.n. [Deer Pond, July 1929] (Cm), s.n. [Lily Pond, July 1929] (Cm), s.n. [Long Pond, July 1929] (Cm); H. D. House 9665 (Al); Kirch s.n. [July 30, 1915] (Cm); Latham 1601 (Al), s.n. [July 29, 1929] (Al); Moldenke & Moldenke 11583 (N); Muenschler & Curtis 6815 (Al), 6817 (Ba), 6818 (Al); Muenschler, Winne, & Isely 20695 (Pl—131989); D. Parker 18 (N); C. H. Peck s.n. [Smithtown] (Al); H. Saint John 2622 (Al); Schrenk & Stewart s.n. [August 7, 1895] (Al); Whitney 3292 (Al). Sullivan Co.: Muenschler & Curtis 5025 (Ba); Whitney 5214 (Al). Ulster Co.: Elting 2870 (Al). Warren Co.: H. D. House 20643 (Al), 28148 (Al). Washington Co.: S. H. Burnham s.n. [Aug. 16, 1899] (Al). Westchester Co.: H. T. Clark 94 (Br); Muenschler & Curtis 5611 (Al); Puissant s.n. [Peekskill] (Br). County undetermined: Adduci 637 [Black Rock State Park] (Wl); Collector undesignated s.n. (Al); Leggett s.n. [Ridgefield, L. I., July 31, 1880] (Tc); J. Torrey 1166 (Al), s.n. [1833] (Br), s.n. [N. Y.] (D—824261, Pa.). NEW JERSEY: Atlantic Co.: Bartram s.n. [Sept. 9, 1906] (Mg); Heritage s.n. [Egg Harbor City, 9-15-1895] (Ur). Burlington Co.: Carson s.n. [Quaker Bridge, 183-] (Ll); W. Stone s.n. [Parkdale, Aug. 1906] (Cm). Camden Co.: O'Neill 8190 (Ms). Cumberland Co.: Dreisbach

1722 (Cm); Treat s.n. [Vineland, July 1871] (Al). Middlesex Co.: C. S. Williamson 2 (D--824258, in part). Monmouth Co.: T. W. Edmondson 5062 (N); B. H. Patterson s.n. [Ocean Grove, Aug. 1894] (Cm); C. S. Williamson 3, in part (D--824258, in part). Morris Co.: Clausen & Clausen 1819 (Ba); Herb. Brakeley s.n. [Greenpond] (Cc); U. C. Smith s.n. [Budd's Lake, Sept. 1, 1899] (Mg). Ocean Co.: E. J. Alexander s.n. [Oct. 5, 1941] (N); Gleason, Smith, & Alexander 173 (Go, Mg, Ur); G. B. Grant 6065 (Po-267595); K. K. Mackenzie 4850 (N); W. Stone s.n. [Aug. 7, 1901] (St--3293). Sussex Co.: Clausen & Edwards 2289 (Ba); J. K. Small 162 (Ob--23918), s.n. [Budd's Lake, August 12--14, 1890] (Au, Cm, Cn). County undetermined: H. R. Bassler 3017, in part (Ka); W. M. Canby s.n. [Spring Garden, Aug. 1858] (Pa); Collector undesigned s.n. [Spring Garden, 8/4/1858] (Cc); F. M. Hexamer s.n. [Nesochaque River, 17 Aug. 1855] (Br); Scheidweiler s.n. (Br); Treat s.n. [July 1875] (Du--71445). PENNSYLVANIA: Bradford Co.: Westerfeld 811 (Cm). Carbon Co.: T. C. Porter s.n. [Aug. 7, 1867] (Pr). Crawford Co.: Van Dersal s.n. [Oct. 22, 1933] (Cm). Lackawanna Co.: Glowenke s.n. [July 30, 1936] (Cm); O. E. Jennings s.n. [8/26/20] (Cm). Luzerne Co.: Heller & Halbach 691 (Ur); J. K. Small s.n. [August 15--16, 1889] (Se--4175). Pike Co.: S. W. Knipe s.n. [12 Mile Pond, 1875] (Cm). Sullivan Co.: C. S. Williamson 1 (D--824258, in part), 3, in part (D--824258, in part). Susquehanna Co.: Fretz 199 (Cm). Wayne Co.: Clausen, Hinkey, & al. 4003 (Ba). County undetermined: C. F. Austin s.n. [Cobb Mt. Pond] (Pr); Schweinitz s.n. [1829] (Br). DELAWARE: New Castle Co.: W. M. Canby s.n. [near Holly Oak, Sept. 1862] (Pa). Sussex Co.: Long & Bartram 1387 (D--648775); McVaugh 6535 (N). MARYLAND: Wicomico Co.: W. M. Canby s.n. [Salisbury, Sept. 1863] (Pa). County undetermined: A. P. Garber s.n. [Mogothy River, Aug. '67] (D--568220). VIRGINIA: Augusta Co.: Killip 32582 (N). County undetermined: Canby s.n. (Du--11077, in part). OHIO: Portage Co.: Ashcraft 10869 (Ur); R. J. Webb s.n. [July 23, 1915] (Cm). Summit Co.: Sterck s.n. [Sept. 26, 1913] (Cm). INDIANA: Laporte Co.: E. J. Hill 146.1875 (Ur), s.n. [Laportè, July 22, 1875] (Dp--2935, in part). Porter Co.: M. A. Chase 557 (Ur, Ur), 616 (Ur), 903 (Ur, Ur), 1255 (Ur); E. J. Hill 170.1897 [Aug. 30] (Ur, Ur), 170.1897 [Sep. 6] (Ur, Ur, Ur), 170.1897 [Oct. 20] (Ur), 135.1898 [May 9] (Ur), 135.1898 [July 26] (Ur, Ur), 155.1898 [Aug. 4] (Ur, Ur), 228.1899 (Ur), 155.1906 (Ur). Steuben Co.: Friesner

14635 (Bt--50661). Wells Co.: C. C. Deam s.n. [9-2-1897] (Ur).
 County undetermined: C. C. Deam 7214 (Gg--276705). MICHIGAN:
 Alcona Co.: Potzger 4617 (Bt--24610). Allegan Co.: Gamon s.n.
 [Saugatuck, July 19, 1898] (Ur). Baraga Co.: Dreisbach 6926
 (Gg). Cass Co.: F. C. Gates s.n. [Cabel Lake, August 4, 1906]
 (Ur). Cheboygan Co.: Beardslee & Kofoid s.n. [Aug. 1, 1890]
 (Cm, Mg, Ob--23901, Ob--23902, Se--4014); M. Campbell 8230 (Bt
 --20808); J. H. Ehlers 6286 (Go); F. C. Gates 11119 (Du--
 166342, Ka--65022, Ob--23880, Se--4058), 11119a (Ka--65023),
11123 (Du--170631, Vt), 14899 (Au, St--21186), 16605 (Ka--
 80897); Gates & Gates 9435 (Ur); Gleason & Gleason 202 (Go, We),
2020 (Bt--30905); M. McKee 618 (Dp--2931); Miner 5153 (Du--
 266812); Potzger s.n. [8/7/31] (Bt--6768); Yuncker 7063 (Dp--
 2934, H--1377). Delta Co.: E. J. Hill 32.1883 (Ur), s.n. [Es-
 canaba, July 10, 1883] (Ur). Isle Royale Co.: C. A. Brown 3626
 (Ob--23879). Manistee Co.: E. J. Hill 149.1880 (Ur, Ur), s.n.
 [Baer Lake, Aug. 19, 1880] (Ur). Menominee Co.: Manning s.n.
 [Lost Lake, 1923] (Cm). Presque Isle Co.: J. H. Ehlers 6150
 (Du--266811). Schoolcraft Co.: W. S. Moffatt 162.1899 (Ur). Van
 Buren Co.: Nieuwland s.n. [Bankson Lake, Sept. 2, 1914; Herb.
 Marie-Victorin 42109] (Vi). WISCONSIN: Ashland Co.: Fassett &
 Wilson 7712 (H--65758). Douglas Co.: J. H. Steenis 1205 (Ob--
 69580). Oconto Co.: Hotchkiss & Koehler 4327 (Bl--43810). Onei-
 da Co.: C. Gross s.n. [Lake Hasbrook, 8/15/37] (Dp--2929);
Throne 2675 (Ka), 2677 (Ka). Polk Co.: Hotchkiss & Martin 4489
 (Po--209289). Vilas Co.: Fassett 8901 (Mg); Potzger 9112 (Bt--
 61162), 9119 (Bt--61239, Bt--61241); L. R. Wilson 3082 (Fl--
 5417, Fl--5418). Washburn Co.: Fassett 7714 (Mg). MINNESOTA:
 Cass Co.: Rosendahl & Butters 6836 (N). Chisago Co.: B. C. Tay-
 lor s.n. [Aug. 1892] (Fl--5388). Crow Wing Co.: F. H. Burtle-
 haus s.n. [Aug. 1891] (Po--185873, Se--4080). Dakota Co.: L. H.
 Bailey B.459e (Ba). Lake Co.: Lakela 3092 (N). Morrison Co.:
Sandberg 887 (Ka). Ottertail Co.: F. F. Wood s.n. [Basswood
 Lake, July 27, 1891] (Du--54393). Saint Louis Co.: Moyle 2388
 (N). ISLE OF SKYE: J. H. Balfour s.n. (Pa); Greville s.n.
 [1829] (Br); Herb. Boettcher 2024 (Gg--105737); Herb. Prager
195 (Gg--106733, in part); Herb. Princeton Univ. s.n. (Pr);
J. D. Hooker s.n. (Br); Lemann s.n. (D--752354). IRELAND: J. H.
 Balfour s.n. [Aug. 8, 1838] (Br); J. P. Brace s.n. (D--752353);
Colgan 3200 (Ob--1268); Farre s.n. [37.7.29] (Br); Groves &
 Groves s.n. [Galway, 8.VIII.1892] (Gg--207024); Lomax s.n. [3

Augusti 1886] (Gg--105734); Mackay s.n. [Aug. 1838] (Br); Praeger s.n. [NW. end of L. Corrib, W. Galway, 16.7.95] (Ur, Ur), s. n. [near Roundstone, W. Galway, 17.7.95] (Ur, Ur, Ur); S. A. Stewart 5965 (Pr); Walker-Arnott s.n. [1837] (Br); W. West s.n. [T. W. Edmondson 2086] (N), s.n. [July 1901] (N); W. Wilson s. n. [Aug. 1825] (D--782364). SCOTLAND: Herb. Boettcher s.n. [Herb. Marie-Victorin 28003] (Vi); Herb. Winterbottom s.n. [west of Scotland, 1837--1842] (Ur, Ur); Macvicar s.n. [Island of Coll, July 1879] (Ur, Ur). LOCALITY OF COLLECTION UNDETERMINED: Abrams 13546 [Alford Lake] (Du--225910); H. C. Cowles s.n. [Wahob Lake, "Fla.", 1906] (Ur); Herb. Jard. Bot. Brux. s.n. (Br); Herb. Kansas State Agr. Coll. s.n. [Europe] (Ka); Jesup s.n. (Ka); H. L. Jones s.n. [Lake Minnipsseopie, July 31, '87] (Ob--23900); Moll s.n. (Br); Oakes s.n. (Ms). ILLUSTRATIONS: Agnes Chase drawing s.n. (Ur).

ERIOCAULON SETACEUM L.

The species is recorded from Mysore by B. A. Razi, Journ. Mysore Univ. 7 (4): 77 (1946), and is described as a hydrophyte and geophyte.

Additional citations: INDIA: Bombay: Stocks s.n. [Concan] (K); W. A. Talbot 633 (K). ANDAMAN ISLANDS: Helfer 5581 (C).

ERIOCAULON SEXANGULARE L.

Synonyms of this species are Eriocaulon quadrangulare Lour., E. quadriangulare Lour., E. wallichianum Mart.; it has been mis-identified in herbaria as E. wightianum Mart. and "E. 5-angular L." and even as Burmannia sp. The Kanehira specimen cited below is mixed with a species of Fimbristylis. The Tsang collection cited below was originally identified as E. truncatum Ham., while the Gressitt specimen was first called E. australe R. Br. and then E. wallichianum Mart. The species is recorded from Mysore by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946) and described as a geophyte. It is said to grow in fields and paddies and along small streams beside forests. Gressitt collected it as 60 m. altitude. Tsang describes the flowers as yellow, and it has been collected in anthesis in May and August. The vernacular name "shui suen" is recorded for it by McClure. An additional synonym is Eriocaulon wallichianum var. tenellum Wight, and E. sinicum Miq. probably also belongs here.

Additional citations: INDIA: Royle s.n. [Peninsula of India] (D--824284); Stocks s.n. (K); R. Wight 2364 [Quilon, 1129] (C, N), 2364b (M, N). BURMA: W. Griffith 5592 (C). CHINA: Fukien:

H. H. Chung 7659 (N), 7662 (N), 7668 (N), 8325 (N). Kwangtung: N. K. Chun 44407 (N); Hom 6 [Herb. Lingnan Univ. 19315] (N), 62 [Herb. Lingnan Univ. 18479] (N); W. T. Tsang 21110 (N); Tsiang 2458 (N), 2458b (N, N). HONGKONG: N. K. Chun 40009 (N); W. Y. Chun 7487 (N); C. Ford s.n. [3-5-93] (N); Milford s.n. (T); G. R. Tate s.n. [Hongkong, 1862-3] (Pr); Tsui 282 (N); C. Wright s.n. (T). HAINAN ISLAND: How & Chun 70286 (N); Ko 52137 (N); Lei 58 (N); F. A. McClure 30828 [Herb. Canton Chr. Coll. 9827] (Gg-105740); W. T. Tsang 424 [Herb. Lingnan Univ. 17173] (N). FRENCH INDOCHINA: Annam: Clemens & Clemens 3301 (D-656769, Gg-156648). Cochinchina: Squires 235 (Gg-159564). Tonkin: Pételot 5251 (N); Poilane 7536 (N), 8068 (N), 8079 (N), 8080 (N), 8082 (N), 8084 (N), 8091 (N), 8092 (N), 8094 (N), 8097 (N), 8098 (N). STRAITS SETTLEMENTS: Singapore: Wilkes s.n. [Singapore, Note B.6.57] (T). LIUKIU ISLANDS: Iriomote: Gressitt 550 (N). CAROLINE ISLANDS: Pelew Islands: Kanehira 418, in part (N). LOCALITY OF COLLECTION UNDESIGNATED: Blackburn s.n. (T); Herb. Wight 2858 (T).

ERIOCAULON SIERRALEONENSE Moldenke

A synonym of this species is Eriocaulon pumilum Afzel. ex Körn., Linnaea 27: 621 (1856), not E. pumilum Raf., Atl. Journ. 121 (1832).

ERIOCAULON SIGMOIDEUM C. Wright

Additional citations: CUBA: Pinar del Río: Moldenke & Moldenke 19879 (N); Moldenke, Moldenke, León, Alain, & Acuña 15265 (Es); C. Wright 3737 (Pa--isotype).

ERIOCAULON SIKOKIANUM Maxim.

The species has been mis-identified as "E. miquelianum Koeck.", and the specific epithet is sometimes written with a capital initial letter. It has been collected in anthesis from August to October.

Additional citations: JAPAN: Hitachi: Herb. Sci. Coll. Imp. Univ. s.n. [Aug. 1903] (Vt). Hokkaido: Tokubuchi s.n. [Sept. 22, 1894] (D-824279). Hondo: Ohwi s.n. [Takaraga-ike, 26.X. 1930] (Ms). Kiushiu: Herb. Sci. Coll. Imp. Univ. s.n. [Sept.] (Vt).

ERIOCAULON SOLLYANUM Royle

The species is said to form dense mats locally in rice fields in Bombay.

Additional citations: INDIA: Assam: Collector undesignated s.n. [Silhet, 5/12/50] (F--photo, K, N--photo, Sg--photo, Z--

photo); Hooker & Thomson s.n. [Khasia] (F--photo, K, N--photo, Sg--photo, Z--photo). Bombay: Blatter, Hallberg, & McCann 27983 (N, Xa), 28009 (N, Xa), 28068 (N, Xa); Santapau 767 (N, Xa), 2184 (N, Xa), 2925 (N, Xa), 3127 (N, Xa), 4817 (N, Xa), 4844 (N, Xa), 4845, in part (Xa); Santapau & McCann 1290, in part (N, Xa); Stocks s.n. (F--photo, K, N, N--photo, Sg--photo, Z--photo). State undetermined: Collector undesignated 1583 [Nuntlow] (F--photo, K, N--photo, Sg--photo, Z--photo).

ERIOCAULON SONDERIANUM Körn.

According to Arwidsson in Bot. Notiser 1934: 83 the original description of this species is accurate and excellent, and the species is a valid one. It has acute leaves, light involucre bractlets, elongate heads, and flowers that are 1.5--2.5 mm. long. He cites Wilms 1575 and Zeyher 1731.

ERIOCAULON SPRUCEANUM Körn.

This species was collected by Killip in water of a small stream in a forest, at an altitude of 500 m., blooming in March.

Additional citations: COLOMBIA: Méta: Killip 34260 (N).

ERIOCAULON SPRUCEANUM f. AMPHIBIUM Herzog

Additional citations: BRAZIL: Amazonas: Luetzelburg 22796 [Herb. Mus. Nac. Rio 47735] (Ja), 23007 [Herb. Mus. Nac. Rio 47686] (Ja, N), 23017 [Herb. Mus. Nac. Rio 47685] (Ja--cotype), 23267 [Herb. Mus. Nac. Rio 47722] (Ja), 23870 [Herb. Mus. Nac. Rio 47732] (F--photo of cotype, Ja--cotype, N--cotype, N--photo of cotype, Sg--photo of cotype, Z--photo of cotype), 23822 [Herb. Mus. Nac. Rio 47684] (Ja--cotype, N--cotype).

ERIOCAULON SPRUCEANUM f. FLUITANS Herzog

The specimens cited by Herzog from Cururu and from Uauapes are both from the state of Pará, Brazil, while that from Cachoeira is from Bahia.

ERIOCAULON STEINBACHII (Moldenke) Moldenke

A synonym is Paepalanthus steinbachii Moldenke. According to Steinbach, the species grows on the banks of a small lake at Campos de Terebinto, where he collected it on August 22, 1916. He states that the inflorescence is dark-violet with white dots.

Additional citations: BOLIVIA: Santa Cruz: Steinbach 2669 [Herb. Inst. Miguel Lillo 50111] (N--type).

ERIOCAULON STELLULATUM Körn.

This species is recorded from Mysore by B. A. Razi in Journ. Mysore Univ. 7 (4): 77 (1946), and is described by him as a therophyte.

Additional citations: INDIA: Bengal: Herb. Hooker s.n. (K).

ERIOCAULON STEYERMARKII Moldenke

The Hering specimen cited below has the collector's name mis-spelled "Hering" in the label and was identified by someone as Eriocaulon septangulare With.

Additional citations: VENEZUELA: Bolivar: Steyermark 58868 (N-type). SURINAM: Hering s.n. (D-824278).

ERIOCAULON STRICTUM Milne-Redhead

This species is known thus far only from the original collection, Fitzgerald 5213/3, from Kilindoni, on Mafia Island, Tanganyika Territory, where it was collected on August 6, 1936, in wet-season lagoons which were then drying up. It is described by the collector as growing in association with bladderworts, milkworts, sedges, and grasses, forming a growth 15 cm. tall. Milne-Redhead states that it is probably related to E. buchani Ruhl., "from which it differs, not only in size and in width of leaf, but in possessing only two sepals in the female flowers, the third sepal being represented by a minute tooth-like rudiment.....The petals of the male flowers.....are variable in size and are often unequal." He supplements his description with an excellent illustration (pl. 3388).

ERIOCAULON SUBULATUM N. E. Br.

Additional citations: SOUTHERN RHODESIA: F. Eyles 125 (F--photo, N--photo, Rh, Sg--photo, Z--photo); Herb. Queen Victoria Memorial 8120 (Rh); Keay 21406 (Rh).

ERIOCAULON TENUIFOLIUM Klotzsch

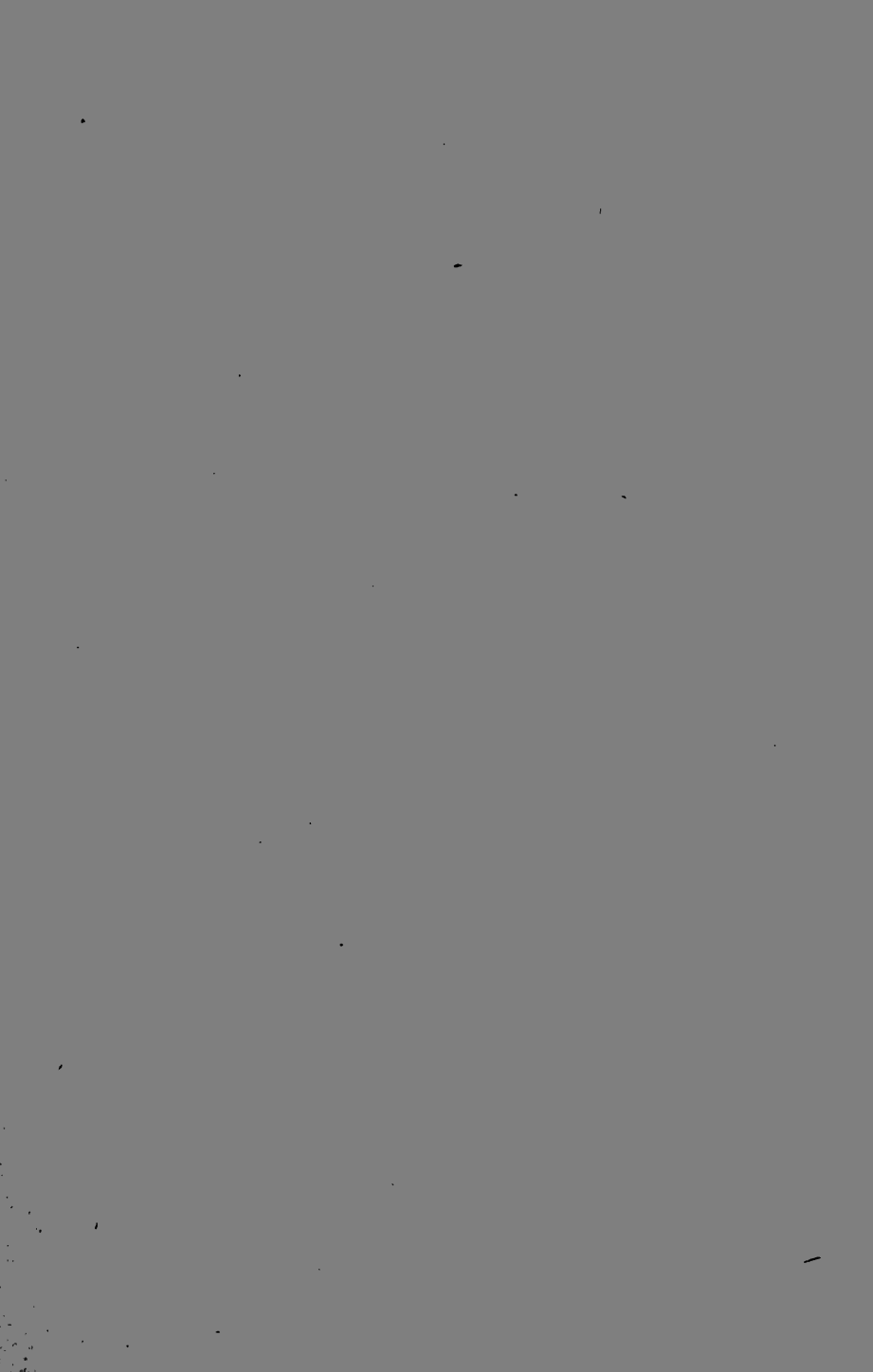
The A. C. Smith 2280, previously regarded as this species, has been found to represent E. atabapense Moldenke instead.

Additional citations: VENEZUELA: Amazonas: Ll. Williams 14084 (W--1878419).

ERIOCAULON TEXENSE Körn.

The species is found in bogs, and has been collected in anthesis from April to June and in August. Warner records the common name "pipewort". Warnock 224 is anomalous in appearance, looking more like E. septangulare With. (as it was identified) or a small example of E. compressum Lam.

Additional citations: TEXAS: Anderson Co.: Lundell & Lundell 8463 (Mi, N). Austin Co.: Tharp s.n. [5/4/40] (Au); Warnock 224 [30] (N, N). Robertson Co.: F. A. Barkley 13543 (N, N).



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CITATION OF SCIENTIFIC NAMES OF PLANTS

Elbert L. Little, Jr.

Greater uniformity and clarity in citation of scientific names of plants should be aims of plant taxonomists. Camp, Rickett, and Weatherby (3, p. 3) have noted that several types of citation were employed in the text and lists of the International Rules of Botanical Nomenclature (2) and suggested that standardization of botanical citations would be advantageous, especially to workers in taxonomy. The next edition of the International Rules, following Rickett's (4, p. 51) proposal, is to have uniform citations and a set of suggestions of rules for citation to serve as a model. As Rickett stated, the lack of a standardized method of citation causes inconvenience to readers and often leads to error. Suggestions for clearer and more uniform citations are offered below.

Of course, a standard system of citing botanical references in general is badly needed also, as discussed by Rickett (7) and Little (6). The Committee on Publication Problems of the American Institute of Biological Sciences is working on this subject. Naturally, plant taxonomists should try to conform to any system accepted by a majority of plant scientists but would need some special rules applying to scientific names instead of references. For example, in citation of scientific names the title of a periodical article is omitted and book titles are abbreviated. Taxonomists can conveniently insert their numerous brief citations in lists of synonymy or in parentheses in the text, without resorting to complicated footnotes or long bibliographies or lists of references.

Agreement on a system for citing scientific names should be relatively easy, because the citations are short and because fewer persons are involved, just the plant taxonomists and not botanists in general, editors, and librarians. Uniformity should be more important to taxonomists because they use so many more citations than other botanists.

The lack of uniformity is everywhere evident. For example, the two most important current taxonomic indexes for higher plants, the Supplementa of Index Kewensis and Gray Herbarium Card-index, have different ways of citing volume, page, and date. The former has conservative citations, such as "1940, xxvii. 188," while the latter has modern citations of different order for these three items, such as "27:188. 1940." The International Rules (2, 3) adopted a third order in its lists, for example, "LXXXIX. (1819) 105." Many additional combina-

tions are possible by variation of Arabic, small Roman, and capital Roman numerals and by placing the year in parentheses. My personal choice is the method of the Gray Herbarium Card-index, of volume in Arabic numerals followed by colon, page number, period, and date. It is hoped that Roman numerals, being less easily read, will be abandoned.

Section 7 of the International Rules (2, 3), Citation of authors' names and of literature for purposes of precision (Art. 46-49, Rec. XXX-XXXII), is concerned mainly with authors and lacks instructions for other parts of the citation. Likewise, the detailed citations to literature of the United States Department of Agriculture, compiled by Whitlock (10), devoted only one paragraph out of 15 pages to citations of scientific names and synonymy.

The four to seven essential parts of a citation following a Latin scientific name, which should be mentioned in rules for citation, are: author (usually abbreviated unless short), abbreviated title of book or periodical, series of periodical (if any), volume (if any), page, figure or illustration (if any), and date. Citations of scientific names differ chiefly from citations of books and periodicals as botanical references as follows: (1) author is usually abbreviated unless short, without forenames or with initials if needed to prevent confusion; (2) title of a book is abbreviated and title of a periodical article is omitted, though abbreviation of the periodical is retained; (3) a single page is cited, the one where the name was published; (4) a single figure is cited, the one illustrating the plant named, or illustration may be omitted; and (5) place of publication of a book is omitted. Other details of citing series, volume, page, and date are the same for scientific names as for references under a set of rules for citations.

A criticism of many citations of scientific names, especially in the older works, is that they are too brief. While the specialist already familiar with a particular work can identify it easily from a much shortened citation, a student or specialist in another branch of botany or a librarian might lose time in locating the desired reference. Of course, the taxonomist working in a large herbarium with its specialized library and with an experienced botanical librarian to bring him any needed reference has no problem. However, the investigator who has to look up the call numbers himself in the large library of a scientific institution or university appreciates the fuller citations.

Instructions for abbreviating authors' names are covered in Recommendation XXX of the International Rules. However, con-

fusion is reduced if names infrequently used and names not easily recognized from the shortened form are left unchanged. Boivin (1, p. 72) has made a good suggestion that abbreviations be fewer in number and be limited to those representing appreciable saving of time and space. He explained that abbreviations when too numerous become difficult to memorize and force botanists to waste time looking them up in indexes. In the 1908 edition of Gray's Manual he reported that abbreviating of authors' names saved only five pages, while three additional pages were required to explain the abbreviations. For consistency it is helpful to follow a list of abbreviations, such as found in that and some other manuals and floras. In a search for a work by an unfamiliar author in the card catalog of a large library, time is saved by first obtaining the author's full name from a list of this kind.

Rickett (1, p. 169) has suggested that Torrey and Gray might well be abbreviated "T. & G." instead of "Torr. et Gray," but the latter is much clearer and not too long. Names shortened to the first letter may be meaningless to those not acquainted with the original work. However, a few well known exceptions, such as L. for Linnaeus and DC. for De Candolle, both given as examples in the Rules, and H. B. K. for Humboldt, Bonpland, and Kunth, are already established. Both "Torr. & Gray" and "Torr. et Gray" are preferred to "Torr. and Gray," which includes an English conjunction in a Latin scientific name. If "and" were approved, then botanists writing in other languages might use the foreign equivalents, or the language of the original work might be retained for the conjunction in each case. (Likewise, in citations of scientific names, Latin "t." for tabula in plate numbers is more consistent than English "pl." for plate.)

A comma between abbreviation of author and the title is helpful, though some contend that the period is sufficient. The old practice of inserting a comma before the author's name should be discontinued.

For abbreviation of titles of current periodicals, one of several lists may be followed, according to the editorial policy of the publication. Examples are the abbreviations used by Biological Abstracts, Bibliography of Agriculture, and the Bulletin of the Torrey Botanical Club (8). Some bibliographies have their own special lists of abbreviations of periodicals.

Perhaps in time one list or system of abbreviations of titles will be adopted officially or otherwise accepted by a majority of publications or workers. At present taxonomists do not agree upon how to cite simple titles, such as North American Flora or Bulletin of the Torrey Botanical Club.

Where titles of books and old periodicals are to be abbreviated, the lists of abbreviations for single words by Jacobs (2, p. 331-349) and Whitlock (2, p. 258-278) are helpful. The first important word of a book title is needed because in a library card catalog the titles of a single author are listed alphabetically. Readers may lose time in searching for an old work cited too briefly or by subtitle.

For book titles two- to four-word abbreviations are not too long, but one-word abbreviations of long titles are to be discouraged. Unimportant words should be omitted, of course, and all those retained should be capitalized. The following title is an example: Browne, Patrick. The Civil and Natural History of Jamaica. 503 p., illus. London. 1756. In the International Rules (2, 3) it is cited as "P. Br., Hist. Jamaica," and some authors shorten the citation to "P. Br. Hist. Jam." In the good old days when there were fewer references, Linnaeus reduced the title to "jam." I urge that "Civ." for the first word in the title be retained and prefer "P. Br., Civ. Nat. Hist. Jamaica."

If the year is uniformly placed at the end, there is no need to enclose it in parentheses to prevent confusion with page or volume numbers. Ordinarily only the year is sufficient for the date, but month and day may be added in parentheses or brackets if important in priority. If the date on title page is incorrect, as determined from other sources, the proper date may be added in brackets.

Rickett (7, p. 169-171) has mentioned the lack of definition of what constitutes a volume, noting that a volume may be issued in parts paged continuously or separately and that two small volumes separately paged may be bound together. The safest guide is to include sufficient details in the citation for a reader to find the reference without difficulty. It should be optional to cite Linnaeus' Mantissa Plantarum Altera (1771) as "Mant. Pl. 2:" though paged continuously with his Mantissa Plantarum (1767). In references with dual systems, such as Das Pflanzenreich, noted by Rickett, citation of the second system in parentheses should be permitted, as some libraries may catalog books under it.

Forest Service,
United States Department of Agriculture,
Washington 25, D. C.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XII

Harold N. Moldenke

ALOYSIA SCORODONIOIDES var. *ORBICULARIS* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum orbicularibus 3—4.5 cm. longis latisque crasse dentatis.

This variety differs from the typical form of the species in having its leaf-blades orbicular, 3—4.5 cm. long and wide, with the margins coarsely dentate from base to apex.

The type was collected by Gustav Karl Wilhelm Hermann Karsten at Yuaco, near Pasto, Nariffo, Colombia, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna.

CALLICARPA BASITRUNCATA Merr., sp. nov.

Frutex; ramis ramulisque gracilibus medullosis obtuse tetragonis obscure furfuraceis vel stellato-puberulis deinde glabratibus; foliis oppositis subsessilibus; petiolis stellato-tomentellis; laminis membranceis oblongis vel suboblanceolatis acutis vel subacuminatis integris vel paucidentatis, ad basim truncatis, supra glabris, subtus in venis stellato-tomentellis, deinde glabrescentibus; inflorescentiis supra-axillaribus cymosis perabbreviatis paucifloris dense stellato-tomentellis.

Shrub, 1 m. tall; branches and branchlets slender, light-colored, medullose, obtusely tetragonal, obscurely furfuraceous or stellate-puberulent, becoming glabrate in age; twigs very slender, brown, rather sparsely stellate-tomentellous with short cinereous hair, densest toward the apex; nodes not annulate; principal internodes to 5.5 cm. long; leaves decussate-opposite, subsessile; petioles 1—2 mm. long, stellate-tomentellous; leaf-blades membranous, much lighter beneath, oblong or very slightly oblanceolate, 6—9 cm. long, 1—2 cm. wide, acute or subacuminate at apex, entire or with a few appressed teeth near the apex, the margins slightly revolute in drying, truncate at base, glabrous above, stellate-tomentellous on the midrib and larger venation beneath when young, glabrescent in age (sometimes a few stellate hairs on the upper surface, especially along the midrib, when immature); inflorescence supra-axillary, much abbreviated, cymose; cymes few-flowered; peduncles very slender, about 5 mm. long, densely stellate-tomentellous; inflorescence-branches usually only one pair, very short, densely stellate-tomentellous; bractlets and prophylla minute; calyx about 1 mm. long and wide, very minutely and sparsely stellate-puberulent or glabrate, its rim very shallowly and obscurely 4-toothed; corolla white, its tube about 2 mm. long, glabrous, its limb 4-lobed, glabrous; stamens exerted.

The type of this species was collected by J. Linsley Gress-

itt (no. 1168) at Liamui (Leng Mun), on a bank by a small grove, Hainan Island, alt. 420 m., in June or July, 1935, and is deposited in the Langlois Herbarium at the Catholic University of America.

CLERODENDRUM CAPITATUM var. *VANDERYSTI* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit tubo corollae glabro, calyce plerumque rubra, et petiolis sarmentisque ramulisque plerumque conspicue longeque hispidis.

This variety differs from the typical form of the species in having the corolla-tube glabrous, the calyx mostly red when mature, and the petioles, twigs, and branchlets mostly very conspicuously long-hispid with stiff brownish hairs 3—4 mm. long standing at right angles.

The type was collected by Hyacinthe Vanderyst (no. 9418) at Ipamu, Belgian Congo, in May, 1921, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM INCISUM var. *PARVIFOLIUM* Moldenke, var. nov.

Haec varietas a forma speciei typica foliis 1—3 cm. longis et 4—10 mm. latis recedit.

This variety differs from the typical form of the species in having its leaves only 1—3 cm. long and 4—10 mm. wide

The type of the variety was collected by Henri Humbert (no. 12741) on Mount Vohitrosy, in the lower valley of the Mandrare near Anadabolava, at an altitude of 800—850 m., Madagascar, in December, 1933, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CLERODENDRUM NUDIFLORUM Moldenke, sp. nov.

Frutex sarmentosus odoratus foetidus; ramulis glabris nitidisque vel interdum apicem versus minute puberulo-pilosulis, sub anthesin nudatis; foliis decussatis glabris nigrescentibus; laminis tenuiter membranaceis nigrescentibus ellipticis saepe conduplicatis acutis vel acuminatis integris vel serratis, ad basim acutis, utrinque glabris; inflorescentiis terminalibus paniculatis laxissime multifloris, cymis paucifloris 1—2-furcatis glabris; calyce campanulato glabro brevissime 5-dentato.

Shrub 5—6 m. tall, branched from the base, with a fetid terbinthine odor; bark gray, smooth; wood white; branchlets rather slender or medium-textured, obtusely tetragonal or sometimes sharply so and with margined angles and longitudinally wrinkled cortex, glabrous and shiny, very light-gray, sometimes minutely puberulous-pilosulous toward the apex, leafless at time of anthesis; twigs similar to the branchlets or the young leaf-producing ones nigrescent in drying, very minutely scattered-pilosulous or glabrous, very slender; nodes not annulate; principal internodes abbreviated, 0.4—6 cm. long; terminal buds & leaf-scars usually rather densely yellowish-puberulent; leaves

decussate-opposite, mostly appearing after the flowers (often a month later), rarely a few greatly undeveloped ones at the base of the inflorescences; petioles distinct, slender, 1--2 cm. long, glabrous, nigrescent in drying; blades thin-membranous, nigrescent in drying, elliptic, often more or less conduplicate, apparently to about 8 cm. long and 3--4 cm. wide, acute or acuminate at the apex, entire-margined when young, later shallowly serrate with broad blunt teeth, acute at the base, glabrous on both surfaces; midrib very slender, flat above, very slightly prominulous beneath; secondaries filiform, about 6 per side, arcuate-ascending, mostly very obscure and flat on both surfaces; veinlet reticulation mostly obscure or indiscernible on both surfaces; inflorescence terminal and terminating abbreviated lateral twigs, paniculate, appearing before the leaves (often a month earlier) or with a few very immature leaves at its base, 10--12 cm. long, 4--6 cm. wide at the base, very loosely many-flowered, composed of about 6--8 pairs of few-flowered cymes; rachis very slender, glabrous, mostly sharply tetragonal; peduncles very slender, exactly similar to the sympodia, about 1 cm. long or obsolete; bractlets linear, 1--3 mm. long, glabrous, a pair subtending each pair of cymes and each cyme-furcation; cymes once or twice furcate, 3--7-flowered, the branches elongate and widely divaricate, glabrous; calyx campanulate or cupuliform, 2--3 mm. long and wide, glabrous, nigrescent in drying, its rim very shortly 5-toothed, the teeth broadly ovate, blunt or acute, often minutely ciliolate, the posterior and two anterior ones slightly smaller and narrower than the lateral ones; corolla white, greenish-yellow, or violet, 2-lipped, puberulent or glabrous above the calyx outside, glabrous or puberulent within, the tube cylindric, about 5 mm. long, arched, the anterior lip bilobed, 7--8 mm. long, the lateral lobes oval, more or less concave, 6--7 mm. long, slightly concave, the posterior lobes slightly narrower and longer than the lateral ones, obtuse, slightly concave and spreading; stamens long-exserted, inserted near the apex of the corolla-tube in the middle of a tuft of hair; filaments glabrous, 10--12 mm. long; anthers bilocular, oblong, dehiscing by means of introrse slits; style terminal, arched, 10--12 mm. long, glabrous; stigma punctiform, sub-bilobed; ovary ovoid, slightly 4-lobed at the apex, 2- or 4-celled, glabrous, sitting on a small green glabrous disk; ovules suspended, anatropous, 2 or 4 per cell; fruiting-calyx patelliform, nigrescent in drying, about 4 mm. wide, subglabrescent, the rim shallowly lobed; fruit drupaceous, subglobose, 6--8 mm. long and wide, glabrous, deeply 2- or 4-lobed in drying.

The type of this distinct species was collected by Henri Perrier de la Bâthie (no. 10221) on hills at Tambirano, Madagascar, on June 8, 1908, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. Its leafless aspect at time of anthesis renders this species most distinctive.

CLERODENDRUM NUDIFLORUM var. PUBERULENTUM Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis rhachideque ramulisque inflorescentiae pedicellisque bracteolisque calyceque densissime puberulis recedit.

This variety differs from the typical form of the species in having the peduncles, rachis, inflorescence-branches, pedicels, bractlets, and calyx very densely puberulent.

The type of the variety was collected by André Seyrig (no. 91) in rocky places near Ampudandara, at 700--1000 m. altitude, Madagascar, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CLERODENDRUM SYLVESTRE var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei pilis pedunculorum pedicellorumque calycumque longioribus patentioribus recedit.

This variety differs from the typical form of the species in having the pubescence on the peduncles, cyme-branches, pedicels and calyxes longer and more spreading, plainly visible to the naked eye.

The type of this variety was collected by Henri Humbert and R. Capuron (no. 22143) in shady woods on gneiss laterite on the western slopes of the Massif de Marojejy (northeast), in the basin of the Lokoho, east of Ambalamansy, Andapa district, Madagascar, between November 28 and December 6, 1948, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

CLERODENDRUM TRIPLINERVE var. SULCATUM (Thomas) Moldenke, comb. nov.

Clerodendrum formicarum var. sulcatum Thomas in Engl., Bot. Jahrb. 68: 74. 1936.

CONGEA PETELOTI Moldenke, sp. nov.

Frutex scandens; ramis ramulisque densissime brunneo-pubescentibus velutinis; foliis decussatis; petiolis densissime brunneo- vel cinereo-pubescentibus, pilis antrorsis subappressis; laminis submembranaceis ellipticis acutis vel breviter acuminatis integris, ad basim plerumque rotundatis, supra densiuscule velutino-pubescentibus, subtus densissime velutinis; inflorescentiis laxe paniculatis dense velutinis; bracteis floralibus 3 ellipticis obtusis densissime albo-tomentellis.

Woody vine; branches and branchlets rather slender, obtusely tetragonal, very densely brownish-pubescent with short somewhat antrorse hairs, velutinous to touch; nodes annulate; principal internodes 2--5 cm. long; leaves decussate-opposite; petioles slender, abbreviated, 4--7 mm. long, very densely brownish- or cinereous-pubescent with antrorse subappressed hairs; leaf-blades submembranous, dark-green above, lighter beneath, elliptic, 5.5--14 cm. long, 3.5--8 cm. wide, acute or short-acumin-

ate at the apex, entire, mostly rounded or rarely subacute at the base, rather densely short-pubescent above, very densely velutinous-pubescent beneath with subappressed cinereous hairs, more densely pubescent on the larger venation above; midrib slender, plane above, prominent beneath; secondaries slender, 3--5 per side, arcuate-ascending, plane above, prominulous beneath, the lower ones not anastomosing at the margins, the upper ones joined in several prominulous loops near the margins; veinlet reticulation abundant, indiscernible above, prominulous beneath, the tertiaries conspicuous, parallel, uniform, issuing at right angles to the secondaries and midrib, mostly unbranched; inflorescence terminal, loosely paniculate, to about 25 cm. long and 21 cm. wide; peduncle short, slender, 3--4.5 cm. long, obtusely tetragonal, very densely velutinous-pubescent like the branchlets; sympodia 5 or 6, rather uniform, elongate, 4--5 cm. long, obtusely tetragonal, densely velutinous-pubescent like the branchlets; panicle-branches very slender, elongate, divaricately spreading at right angles, the lower ones to 13 cm. long, densely velutinous-pubescent, mostly with few widely-spaced cymes toward their apex, the cymes on white-pubescent stalks about 1 cm. long; cauline bracts a pair at the base of each panicle-branch, ovate or ovate-elliptic, 0.5--2 cm. long, 3--7 mm. wide, stipitate, acute at apex, entire, rounded at base, very densely white-velutinous or tomentellous on both surfaces; floral bracts 3, elliptic, 15--20 mm. long, 6--8 mm. wide, sessile, separate, obtuse or rounded at apex, entire, very densely white-tomentellous with matted hairs above, rather densely whitish-pubescent with subappressed hairs beneath, the venation mostly indiscernible above and quite prominent beneath; cymes about 6-flowered, the flowers sessile; calyx campanulate, about 5 mm. long and 4 mm. wide at anthesis, densely white-pubescent or -subtomentellous outside, the rim plainly 5-lobed, the lobes triangular-ovate, 1--1.5 mm. long, acute at the apex, erect; corolla slightly exserted, about 7 mm. long, brownish-pilose; stamens and pistil long-exserted, 12--17 mm. long.

The type of this very distinct species was collected by my good friend and colleague, Paul Alfred Pételot (no. 3852a) — in whose honor it is named — in thickets on sandy-calcareous soil at the village of Thom, province of Common, Tonkin, French Indo-china, in December, 1930, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON APICULATUM H. Lecomte & Moldenke, sp. nov.

Herba parva acaulescens; foliis caespitosis adscendentibus vel recurvatis 1--2 cm. longis obtusis glabris; vaginis laxiusculis glabris 1--2 cm. longis; pedunculis 4-costatis glabris 7--10 cm. longis; capitulis atro-griseis vel subnigris 3--4 mm. latis.

Small acaulescent herb; leaves cespitose, dark-green, ascending or recurved, 1--2 cm. long, 1--2 mm. wide at the mid-point, about 6-nerved, rather firm-textured and brunnescent in drying, not noticeably fenestrate, blunt or obtuse at apex, glabrous; sheath 1--2 cm. long, rather loose, not twisted, equalling or surpassing the leaves, glabrous, of the same color and texture as the leaves, obliquely split at the apex, the blades slightly scarious-margined; peduncles filiform, 2--8 per plant, 7--10 cm. long, 4-costate, slightly twisted, glabrous; heads hemispheric, blackish or dark-gray, 3--4 mm. wide; involueral bractlets pale-stramineous, obovate, about 2 mm. long and 1 mm. wide, rounded at the apex, glabrous; receptacle glabrous; receptacular bractlets black, broadly cucullate-obovate, about 2 mm. long and 1.5 mm. wide, rounded at apex, glabrous; staminate florets: sepals 2, black on the upper half, hyaline at base, spatulate, about 1.5 mm. long and 0.5 mm. wide, slightly navicular and falcate, rounded at apex, glabrous; petals 3, connate into a whitish tube about 0.8 mm. long, glabrous, the free terminal portion minute, black-glanduliferous at the apex; stamens 6; filaments about equaling the petal-lobes; anthers dark-brown; pistillate florets: sepals 3, separate, black, oblong-spatulate, navicular and somewhat falcate, about 1.5 mm. long and 0.5 mm. wide, obtuse at apex, glabrous; petals 3, separate, hyaline, linear-oblong, about 1.3 mm. long and 0.3 mm. wide, acute and black-glanduliferous at apex, sparsely pilose along the margins; style slender, about 0.4 mm. long, glabrous, not appendaged; stigmas 3, about 0.8 mm. long; ovary subglobose, about 0.6 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this species was collected by Bernier (no. 79) on constantly inundated rocks at the cascades of Semiang, Madagascar, in or about 1834, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ERIOCAULON BROWNIANUM var. *LATIFOLIUM* Moldenke, var. nov.

Haec varietas a forma typica speciei foliis usque ad 1 cm. latis recedit.

This variety differs from the typical form of the species in having its leaves to 1 cm. wide at the mid-point.

The type of the variety was collected by George Henry Kendrick Thwaites (C.P. 378) at an altitude of 7000 feet in Ceylon and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

ERIOCAULON FLUMINEUM Moldenke, sp. nov.

Herba aquatica acaulescens; foliis basalibus numerosis filiformibus vel graminoidis valde variabilibus 40--60 cm. longis nervosis pulverulis vel glabris non fenestratis; vaginis crassis laxis 12--14 cm. longis glabris; pedunculis solitariis

percrassis 35--65 cm. longis valde spiraliter tortuosis multicostratis sulcatisque glabris nitidis; capitulis 15 mm. diametro griseis crassis firmis.

Acaulescent aquatic herb; leaves basal, numerous, filiform or grass-like, very variable in width, 40--60 cm. long, 1--4 mm. wide at the mid-point, usually considerably ampliate at the base (sometimes to 12 mm.), with several or numerous parallel veins which are sometimes prominent beneath, pulverulent or glabrous on both surfaces, not fenestrate, often subulate-tipped, often wavy; sheath coarse, loose, 12--14 cm. long, 2.5--5 mm. wide, somewhat twisted, glabrous, deeply split at the apex, the lobes about 1.5 cm. long, ovate, erect, blunt-tipped; peduncles solitary, very coarse, 35--65 cm. long, to 4 mm. in diameter, very conspicuously spirally twisted, many-costate and -sulcate, the costae broad and flattened, glabrous, shiny; heads hemispheric, about 15 mm. in diameter, grayish, firm and hard; involucrel bractlets tough, firm, stramineous, ovate-elliptic, about 2.5 mm. long and 2 mm. wide, rounded (often irregularly split) at the apex, glabrous and shiny on both surfaces; receptacle glabrous; receptacular bractlets blackish, elliptic, concave, about 4.5 mm. long and 2 mm. wide, triangular-acute at the apex, truncate at base, often with a small tooth on each margin near the middle, glabrous; staminate florets: sepals 3, separate, spatulate, blackish, about 3 mm. long and 1 mm. wide, rounded at the apex and densely barbellate there, attenuate-cuneate to the base; petals 3, united into an infundibular tube about 2.8 mm. long, the free portions 1 mm. long, lingulate, rounded at apex, with a small black gland near the apex within; stamens 6, unequal, not surpassing the petallobes; pistillate florets: sepals 3, separate, blackish, spatulate, about 3 mm. long and 1 mm. wide, slightly concave, glabrous, acute at the apex, broadly cuneate or cuneate-oblong at the base; petals 3, separate, hyaline, spatulate, about 3 mm. long and 1.3 mm. wide, rounded to a very short mucronate apex, glabrous on the back, pilose within, with a small black gland near the apex within, cuneate-oblong at the base; style about 0.5--1.4 mm. long; stigmas 3, about 0.7--1 mm. long; ovary oblong, about 0.8 mm. long and 0.5 mm. wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this very distinctive species was collected by Raymond Decary (no. 5423) in the rapids of the upper Manambia, in the vicinity of Vondrozo, province of Farafangana, Madagascar, on September 5, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ERIOCAULON HETEROCHITON var. *ACUMINATUM* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit bracteolis involucri lanceolatis-elongatis, 2.5--3 mm. longis attenuato-acutis vel acuminatis, capitulis fructiferis ovato-cylindricis

usque ad 6 mm. longis brunneis, bracteolis receptaculi valde perspicuis peracuminatis.

This variety differs from the typical form of the species in having the involucrel bractlets lanceolate-elongate, 2.5--3 mm. long, surpassing the disk, attenuate-acute or acuminate at the apex, and the heads in fruit ovate-cylindric, to 6 mm. long, brown, with the receptacular bractlets very conspicuous, as large as the reflexed involucrel ones, conspicuously acuminate.

The type of this variety was collected by Henri Perrier de la Bâthie (no. 7241) in brackish marshes near Cape St. André, Madagascar, in June, 1904, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ERIOCAULON INUNDATUM Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis graminoides tenuiter membranaceis valde fenestratis 3--5 cm. longis glabris; vaginis late cylindricis 2--3 cm. longis glabris non tortis; pedunculis gracillimis 2--12.5 cm. longis 4- vel 5-costatis glabris; capitulis griseis ca. 4 mm. latis.

Acaulescent herb; leaves rosulate, grass-like, thin-membranous, conspicuously fenestrate, 3--5 cm. long, about 2.5 mm. wide at the mid-point, gradually narrowed from base to apex, glabrous and shiny on both surfaces; sheaths broadly cylindric, 2--3 cm. long, striate, glabrous, not twisted, obliquely split near the apex, the blade about 4 mm. long; peduncles 5--7 per plant, very slender, 2--12.5 cm. long, 4- or 5-costate, glabrous, hardly twisted; heads about 4 mm. wide, grayish; involucrel bractlets pale-stramineous, obovate-spatulate, about 2.5 mm. long and 1.5 mm. wide, rounded or subtruncate at the apex, slightly concave-cucullate toward the apex, broadly cuneate at the base, glabrous, shiny; receptacle glabrous; receptacular bractlets pale-stramineous, obovate, about 1.5 mm. long and 1.3 mm. wide, broadly rounded and short-mucronate at the apex and somewhat cucullate there, white-pilous toward and at the apex on the back, otherwise glabrous; staminate florets: sepals 3, separate, pale-stramineous, obovate, navicular, about 1.3 mm. long and 0.6 mm. wide, rounded and slightly cucullate and fimbriate at the apex, attenuate at base, glabrous, not glanduliferous; petal-tube white, about 1.3 mm. long, clavate, glabrous, free portion of the petals very minute, triangular-attenuate; free filaments 6, filiform, white, about 0.2 mm. long; anthers with 2 thecae, 4 cells; pistillate florets: sepals 3, hyaline, separate, oblong, about 1 mm. long and 0.2 mm. wide, emarginate at the apex, glabrous; petals 3, hyaline, separate, oblanceolate, about 1.3 mm. long and 0.4 mm. wide, broadly acute at the apex, attenuate to the base, white-pilose and barbellate at the apex, otherwise glabrous, non-glanduliferous; style about 0.4 mm. long; stigmas about 0.4 mm. long; ovary subglobose, about 0.4 mm. long and wide, 3-sulcate, 3-celled, 3-ovulate.

The type of this species was collected by Théodore Modod on inundated ground at Palmarin, Senegal, on October 28, 1943, and is deposited in the herbarium of the Institut François d'Afrique Noire at Dakar. The type specimen was examined by R. D. Meikle at Kew, who reports that it represents a new species related to *E. hanningtonii* N. E. Br.

ERIOCAULON MADAGASCARIENSE Moldenke, sp. nov.

Herba aquatica; caulis elongatis 30--40 cm. longis submersis dense uniformeque foliosis; foliis capillaceis 3--4 cm. longis glabris; vaginis membranaceis 6--7 cm. longis laxis fenestratis glabris; pedunculis solitariis stramineis 30--50 cm. longis 5-costatis glabris; capitulis hemisphaericis albo-villosis.

Aquatic herb in flowing water; stems very slender, elongated, 30--40 cm. long, submerged, densely and uniformly leafy throughout; leaves hair-like, 3--4 cm. long, pale-green, glabrous, becoming matted when removed from the water; sheath membranous, 6--7 cm. long, loose, rather uniformly 3 mm. wide, several-nerved, fenestrate, glabrous, deeply split at the apex, the lobes erect, acute; peduncles solitary, apparently issuing some distance below the apex of each stem, erect, stramineous, 30--50 cm. long, 5-ribbed, flattened, glabrous, not noticeably twisted; heads hemispheric, white-villous, 7--9 mm. wide; involuclral bractlets broadly elliptic-lingulate, black toward the apex, about 3 mm. long and 2 mm. wide, rounded at the apex, glabrous, shiny; receptacle white-villous; receptacular bractlets elliptic, concave, black, 2--3 mm. long, 1--1.5 mm. wide, cucullate-acute at the apex, glabrous; staminate florets: sepals 3, separate, spatulate, about 2 mm. long and 0.5 mm. wide, hyaline, obtuse at the apex, densely white-barbellate on the back above the middle; petals 3, connate up to the stamens, the free portion linear, hyaline, minute, glabrous except for the erecto-pilous apex, one often larger than the other two; stamens 6, unequal; anthers large, oblong, brown, about 0.7 mm. long; pistillate florets: not seen.

The type of this very distinct species was collected by Henri Perrier de la Bâthie (no. 17905) near Antrirabe, Madagascar, in February, 1927, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. Only staminate florets were in the head dissected. It was thought best not to injure the remaining heads on the type specimen in search of female florets, but to await further collections of this species, which is easily identified by its habitual characters.

ERIOCAULON MOKALENSE Moldenke, sp. nov.

Herba humilis acaulescens; foliis rosulatis graminoidis plusminusve adpressis 1--3 cm. longis glabris; vaginis laxis ca. 8 mm. longis membranaceis glabris cyathiformibus; pedunculis gracillimis 1.5--3 cm. longis tortis glabris; capitulis at-

ro-griseis vel nigrescentibus 4--5 mm. latis.

Low acaulescent herb; leaves rosulate, grass-like, more or less appressed to the ground, 1--3 cm. long, 0.8--2 mm. wide at the mid-point, gradually ampliate to the base, green, mostly obscurely many-nerved and fenestrate only at the base, opaque when mature, glabrous, subulate- or somewhat blunt-tipped; sheath loose, about 8 mm. long, membranous, glabrous, the lower 3 mm. narrow-cylindric, the upper 5 mm. abruptly ampliate in cyathiform fashion, scarious, erect, obliquely split or 2-lobed, the lobes ovate, triangular-acute; peduncles very slender, 3--10 per plant, surpassing the leaves, 1.5--3 cm. long, minutely several-costate, twisted, glabrous; heads hemispheric, dark-gray or blackish, 4--5 mm. wide; involucrel bractlets broadly oblong-elliptic, stramineous or blackish-tipped, about 2.5 mm. long and 1.5 mm. wide, rounded and very minutely denticulate at apex, glabrous, shiny; receptacle glabrous; receptacular bractlets hyaline on the lower half, black above the middle, obovate-spatulate, about 2 mm. long and 1 mm. wide, rounded and minutely denticulate at the apex with a very minute apiculation at the center, glabrous; staminate florets: sepals 2, blackish, navicular, slightly falcate, obovate, 1.3--1.5 mm. long, about 0.6 mm. wide, rounded and irregularly denticulate at the apex, glabrous; petals 3, united into a solid white tube about 1.5 mm. long, the free terminal portions hyaline, minute; stamens 6; anthers dark-brown; pistillate florets: sepals 3, separate, blackish, oblanceolate, about 1.3 mm. long and 0.4 mm. wide, navicular, acute at the apex, glabrous; petals 3, separate, hyaline, oblong-spatulate, about 1.3 mm. long and 0.2 mm. wide, pilose along the margins, black-glanduliferous at the apex; style slender, about 0.2 mm. long, glabrous, unappendaged; stigmas 3, erect, very slender, about 0.8 mm. long; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this species was collected by Raymond Decary (no. 10229) among wet rocks in full sunlight at Mokala, district of Fort Dauphin, Madagascar, on August 7, 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ERIOCAULON PARVICAPITULATUM Moldenke, sp. nov.

Herba parva acaulescens; foliis caespitosis linearibus numerosis adscendentibus 1--7 cm. longis subulatis fenestratis glabris; vaginis membranaceis 5--7 mm. longis laxis glabris; pedunculis valde numerosis filiformibus 1--4 cm. longis glabris non tortis; capitulis obconicis stramineis paucifloris 2--3 mm. latis.

Small acaulescent herb; leaves cespitose, green, linear, numerous, ascending, 1--7 cm. long, about 0.5 mm. wide, subulate-tipped, fenestrate, glabrous; sheath membranous, 5--7 mm.

long, loose, glabrous, about 0.7 mm. wide, deeply split at the apex, the lobes erect, scarious-hyaline, acute; peduncles very numerous, 30--100 per plant, filiform, 1--4 cm. long, 3-costate, not twisted, glabrous; heads obconic, stramineous, 2--3 mm. wide, few-flowered; involucrel bractlets stramineous, elliptic, concave, about 2.5 mm. long and 1.5 mm. wide, blunt at the apex, glabrous, shiny; receptacle glabrous; receptacular bractlets elliptic-lanceolate, about 2.5 mm. long and 1 mm. wide, acute at the apex, concave, glabrous; staminate florets: sepals 3, separate, hyaline, oblanceolate, about 1.5 mm. long and 0.3 mm. wide, attenuate-acute at apex, narrowed to the base, glabrous; petals 3, connate into a hyaline tube about 0.8 mm. long, the free terminal portions minute, oblong, black-glanduliferous; stamens 6, very small; anthers globose, white; pistillate florets: sepals 3, separate, hyaline, narrowly elliptic, about 1.7 mm. long and 0.4 mm. wide, acute at the apex, narrowed and involute at the base, glabrous; petals 3, separate, linear, hyaline, about 0.6 mm. long and 0.09 mm. wide, glabrous; style about 0.6 mm. long, very slender; stigmas 3, erect, about 0.6 mm. long; ovary subglobose, brownish, about 0.4 mm. long and wide, 3-sulcate, 3-celled, 3-ovulate.

The type of this distinct species was collected by Henri Perrier de la Bâthie (no. 7250) in marshes at Antrirabe, altitude 1500 m., Madagascar, in May, 1914, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

ERIOCAULON SCHWEICKERDTI Moldenke, sp. nov.

Herba parva acaulescens; foliis rosulatis graminoides membranaceis multinervis ca. 1 cm. longis obtusis glabris; vaginis pallide stramineis membranaceis laxis 8--10 mm. longis glabris; pedunculis ca. 15 crassiusculis pallide stramineis ca. 3 cm. longis 5-costatis glabris non tortis; capitulis hemisphaerico-ovatis lapido-caeruleis nigrescentibus 5 mm. latis.

Small acaulescent herb, described as 10--15 cm. tall by the collectors; leaves rosulate, grass-like, membranous, many-nerved, minutely fenestrate under a hand-lens, about 1 cm. long and to 3.5 mm. wide, blunt at the apex, glabrous on both surfaces, much shorter than the mature peduncles; sheath pale-stramineous, membranous, loose, 8--10 mm. long, deeply split at the apex, glabrous throughout, the lobes lanceolate-ovate, erect, about 3 mm. long, attenuate-acute at the apex; peduncles about 15 per plant, comparatively stout, pale-stramineous, about 3 cm. long when mature, surpassing the leaves, 5-costate, glabrous, not twisted; heads hemispheric-ovate, slate-blue when fresh, black in drying, about 5 mm. wide when mature; involucrel bractlets broadly obovate, blackish, concave, closely imbricate, about 2 mm. long and 1.8 mm. wide, rounded at the apex, subcuneate at the base, glabrous; receptacle glabrous; receptacular bractlets obovate-spatulate, blackish, about 2 mm. long and 1

mm. wide, acute or obtuse at the apex, often slightly denticulate above the middle, long-cuneate at the base, glabrous; staminate florets: sepals 3, connate only at the base, narrowly elliptic, about 1 mm. long and 0.3 mm. wide, obtuse and often slightly denticulate at the apex, glabrous; petal-tube hyaline, about 1.3 mm. long, glabrous, the free terminal portions 3, ovate-triangular, about 0.4 mm. long; stamens 4; anthers black; pistillate florets: sepals 3, blackish, oblanceolate, about 1.3 mm. long and 0.6 mm. wide, triangular-acute and denticulate at the apex, glabrous; petals 3, linear, hyaline, about 1.3 mm. long and 0.1 mm. wide, erect, glabrous, very sparsely pilose at the very apex; style about 0.4 mm. long; stigmas 3, about 0.4 mm. long; ovary subglobose, about 0.4 mm. long and wide, deeply 3-sulcate, 3-celled, 3-ovulate.

The type of this species was found as occasional specimens in water in a sandy streambed along the Nyamshatu River, in the Umtali district, Natal, Union of South Africa, in July, 1948, by Fisher and Schweickerdt (no. 234) and is no. 22324 in the Government Herbarium at Salisbury, Southern Rhodesia.

ERIOCAULON SELLOWIANUM var. *LONGIFOLIUM* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis plerumque pollice longioribus (usque ad 6 cm. longis) tenuioribus et pellucidis.

This variety differs from the typical form of the species in having its leaves usually more than an inch long (up to 6 cm. long), thin-membranous, and pellucid.

The type of the variety was collected in the neighborhood of Salinas, Goyaz, Brazil, by Hugh Algernon Weddell (no. 2138) and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

ERIOCAULON TRILOBATUM var. *GLABRESCENS* Moldenke, var. nov.

Haec varietas a forma typica speciei foliis vaginisque omnino glabris recedit.

This variety differs from the typical form of the species in having its leaves and sheaths completely glabrous throughout at all times.

The type of the variety was collected by my good friend and colleague, Dr. Henri Humbert (no. 18055), in depressions in gneiss laterite in the forest of Analavory between Mandritsara and Andilamena, altitude 800 m., Madagascar, at the beginning of November, 1937, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

GMELINA PALAWENSIS var. *CELEBICA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum coriaceis vel subcoriaceis plerumque distincte obovatis, ad basim attenuato-cuneatis, usque ad 21 cm. longis.

This variety differs from the typical form of the species in having its leaf-blades coriaceous or subcoriaceous when mature, mostly distinctly obovate, and attenuate-cuneate at the base, to 21 cm. long and 8.7 cm. wide.

The type of the variety was collected by G. Kjellberg (no. 2001) at sea-level at Malili, Celebes, on August 2, 1929, and is no. 21308 in the Herbarium Bogoriense at Buitenzorg.

GMELINA PALAWENSIS var. *DINAGATENSIS* Moldenke, var. nov.

Haec varietas a forma typica speciei foliis subcoriaceis ellipticis 7--15 cm. longis, 3.5--7.5 cm. latis, acuminatis recedit.

This variety differs from the typical form of the species in having subcoriaceous elliptic leaf-blades, 7--15 cm. long, 3.5--7.5 cm. wide, acuminate at the base.

The type of this variety was collected by Captain George Patrick Ahern (no. 461Q) on the island of Dinagat, Philippine Islands, in 1901 or 1902, and is no. 21305 in the Herbarium Bogoriense at Buitenzorg.

KALAHARIA SPINESCENS var. *HIRSUTA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit caulibus ramisque ramulisque spinisque foliisque pedunculisque calicibusque dense patenteque hirsutis.

This variety differs from the typical form of the species in having the stems, branches, branchlets, spines, leaves, peduncles, and calyxes densely spreading-hirsute.

The type of the variety was collected by Bernard Dearman Burt (no. 3806) at Kazikazi, altitude 4200 feet, Tanganyika Territory, on July 14, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

LANTANA PUNCTULATA Moldenke, sp. nov.

Frutex multiramulus; ramis ramulisque gracillimis sarmentosis tetragonis inermibus glabratibus; sarmentis obscure substrigillosis glabrescentibus; foliis decussatis; petiolis brevissimis minute strigillosis; laminis submembranaceis brunnescentibus ovatis acutis crenatis, ad basim acutis, supra densiuscule strigillosis et resinoso-punctulatis, subtus densissime resinoso-punctulatis glabrescentibus.

Much-branched shrub; branches and branchlets very slender, light-gray, twiggy, tetragonal, unarmed, glabrate; twigs very slender, often brunnescent in drying, unarmed, very obscurely scattered-strigillose, glabrescent in age; nodes not annulate; principal internodes abbreviated, 0.4--3.5 cm. long, mostly quite regular; leaves decussate-opposite; petioles very slender, very short, 1--4 mm. long, minutely strigillose; blades submembranous, brunnescent in drying, ovate, 1--3 cm. long, 0.5--1.7 cm. wide, acute at the apex, regularly crenate along the

margins, apparently acute at the base, rather densely strigillose and resinous-punctulate above, very densely resinous-punctate beneath but much more sparsely strigillose or glabrescent; midrib very slender, flat above, slightly subprominulous beneath; secondaries very slender, 2 or 3 per side, flat and inconspicuous above, subprominulous or almost flat beneath; veinlet reticulation sparse, obscure or indiscernible above, only the larger tertiaries plainly visible beneath; inflorescence axillary, in opposite pairs at and near the tips of the twigs; peduncles filiform, 9--12 mm. long, very minutely scattered-strigillose and more or less resinous-punctate; heads capitate, about 1 cm. long and wide during anthesis, rather few-flowered, dense; bractlets large and foliaceous, conspicuous, broadly elliptic, membranous, about 5 mm. long and 3 mm. wide, acute at the apex, very sparsely scattered-strigillose on the back and rather densely resinous-punctate; corolla-tube very narrow-cylindric, about 5 mm. long, densely strigose on the outside, the limb about 3--5 mm. wide.

The type of this species was collected in woods at Colares, along the Amazon, Pará, Brazil, in June, 1832, probably by Eduard Friedrich Poeppig, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna.

LIPPIA CALLENSI var. VILLOSA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis saepe verticillatis obovato-ellipticis usque ad 6 cm. latis, capitulis parvioribus densioribusque, et ramis fulvo-villosis (apicem versus densissimis velutinosisque).

This variety differs from the typical form of the species in having its leaves often whorled, obovate-elliptic, to 6 cm. wide, its heads smaller and denser, less than 1 cm. wide, and the pubescence on the stems fulvous-villous, very dense and velutinous toward the apex.

The type of the variety was collected by W. Mullenders (no. 2093) in a herbaceous savanna, altitude 870 m., at Kasendjim, Haut Lomami, Belgian Congo, on February 27, 1948, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

LIPPIA GRANDIFOLIA var. ANGUSTISPICATA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit spicis 2--3 cm. longis, ca. 7 mm. latis, regulariter quadrangulari-cylindricis densissime multifloris, bracteolis artissime imbricatis, pedunculis valde abbreviatis, bracteolis ovatis carinatis.

This variety differs from the typical form of the species in having the spikes 2--3 cm. long and about 7 mm. wide throughout, regularly quadrangular-cylindric, very densely many-flowered, with very closely imbricate bractlets, the peduncles much abbreviated, 5 mm. long or less, the bractlets ovate, 4--5 mm.

long, keeled on the back, shortly attenuate-subacuminate or acute at the apex, canescent-strigillose on the back.

The type of the variety was collected by Van der Gucht (no. 364) in the Belgian Congo in 1912, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. It is described as a shrub 1--1.5 m. tall, with cream-yellow flowers.

MERTENSIA VIRGINICA f. **BERDI** Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by H. N. Moldenke (no. 21164) in a meadow along the banks of the Brandywine Creek, about 3 miles north of Wilmington, New Castle County, Delaware, on April 29, 1951, and is deposited in the Britton Herbarium at the New York Botanical Garden. The form is named in honor of my good friend and colleague, Morris Berd, whose unquenchable enthusiasm for all forms of Nature study led to the discovery of this hitherto unnamed albino form in the most spectacularly beautiful stand of "Brandywine bluebells" (the typical form) ever seen by myself.

PADUS VIRGINIANA var. **MELANOCARPA** (A. Nels.) Moldenke, comb. nov.

Cerasus demissa var. *melanocarpa* A. Nels., Bot. Gaz. 34: 25. 1902.

PADUS VIRGINIANA f. **XANTHOCARPA** (Sarg.) Moldenke, comb. nov.

Prunus virginiana f. *xanthocarpa* Sarg., Journ. Arnold Arb. 2: 117. 1920.

PAEPALANTHUS MINASENSIS Moldenke, sp. nov.

Herba caulescens; caulibus 4--5 cm. longis omnino dense foliosis densissime longi-villosis, pilis cinnamomeis tomentosiss; foliis linearibus 5--13 cm. longis, 0.6 mm. latis, subulate-apiculatis glabris nitidis; vaginis anguste cylindricis ca. 2 cm. longis glabris; pedunculis solitariis paucis filiformibus 11 cm. longis 3-costatis tortis glabris stramineis nitidis; capitulis globosis griseo-brunneis ca. 4 mm. latis.

Caulescent herb; stems to 4 or 5 cm. long, densely leafy throughout, very densely long-villous with cinnamon-brown hairs making a conspicuous mat among the leaf-bases and completely hiding them; leaves linear, practically uniform in width throughout, 5--13 cm. long, about 0.6 mm. wide throughout, subulate-apiculate at the apex, glabrous and shiny on both surfaces; sheaths narrowly cylindric, about 2 cm. long, glabrous, obliquely split at the apex, the blade thin-membranous, subhyaline, about 3 mm. long; peduncles solitary, few per plant, filiform, about 11 cm. long, 3-costate, twisted, glabrous,

stramineous, shiny; heads globose, about 4 mm. wide, grayish-brown; involucrel bractlets in several series, oblong, 1.3—1.9 mm. long, 0.8—1 mm. wide, brown or blackish along the middle and toward the apex, abruptly acute at the apex, glabrous; receptacular bractlets brownish, very thin-textured, oblong-elliptic, about 1.5 mm. long and 0.8 mm. wide, acute at the apex, densely barbellate on the back at the apex; staminate florets: sepals 3, separate, very thin-textured, brownish toward the apex, oblong-elliptic, about 1 mm. long and 0.3 mm. wide, densely white-barbellate at the apex on the back; petals 3, united into a hyaline tube about 1.5 mm. long, the free portions very small, glabrous; stamens 3, adnate to the petal-tube except at the apex; pistillate florets: sepals 3, separate, brownish, oblanceolate-spatulate, about 1.3 mm. long and 0.6 mm. wide, obtuse at the apex and densely white-barbellate there; petals 3, narrowly oblong, hyaline, about 1.3 mm. long and 0.2 mm. wide, long-pilose at the apex; style almost obsolete, about 0.09 mm. long, stout; stigmas 3, about 0.2 mm. long; style-appendages 3, about 0.4 mm. long; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-lobed, 3-celled, 3-ovulate.

The type of this species was collected in Minas Geraes, Brazil, by Martin Martens, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels, presented by Pierre Martens in 1932.

PETRAEOVITEX SUMATRANA var. SALOMONENSIS (Bakh.) Moldenke, comb. nov.

Petraeovitex multiflora var. *salomonensis* Bakh., Journ. Arnold Arb. 16: 73. 1935.

PREMNA BEQUAERTI Moldenke, sp. nov.

Frutex vel arbor; ramis ramulisque gracilibus dense cinereo-pubescentibus; foliis decussatis; petiolis densissime cinereo-pubescentibus; laminis membranaceis brunnescentibus late ellipticis abrupte acutis vel breviter acuminatis integris, ad basim rotundatis, supra plusminusve pulverulento-lepidellis, subtus dense resinoso-punctatis vel lepidellis, in venis albido-puberulis; inflorescentiis terminalibus paniculatis multifloris.

Shrub or tree; branches and branchlets slender, obtusely tetragonal, densely cinereous-pubescent on the younger parts, the twigs more densely so; nodes not annulate; principal internodes 0.5—2.5 cm. long, mostly abbreviated; leaves decussate-opposite; petioles slender, 10—18 mm. long, very densely cinereous-pubescent; blades membranous, brunnescent or almost nigrescent in drying, lighter beneath, broadly elliptic, 3—8 cm. long, 2.3—6 cm. wide, abruptly acute or short-acuminate at the apex, entire, rounded at the base, more or less pulverulent-lepidellous on the lamina above, densely albidous-puberulent on

the midrib and lower parts of the secondaries, more densely and persistently white-puberulent on the midrib and secondaries beneath, densely resinous-punctate or lepidellous on the lamina beneath; midrib slender, flat above, somewhat prominulous beneath; secondaries filiform, about 4 per side, ascending and slightly arcuate, flat above, only very slightly prominulous beneath; veinlet reticulation abundant, but mostly indiscernible above and obscure beneath; inflorescence terminal, paniculate, many-flowered, 4--6 cm. long, about 4 cm. wide; peduncles rather slender, tetragonal, 1.5--2 cm. long, densely cinereous-pubescent, often with a pair of large foliaceous bracts at its apex which are to 2.6 cm. long and 10 mm. wide and are stipitate like the leaves and resemble them in shape and texture and pubescence; bractlets ovate, 2--3 mm. long, a pair subtending each cyme-furcation, conduplicate-sessile at the base, attenuate at the apex, densely cinereous-pubescent; pedicels filiform, 0.5 mm. long, pubescent; calyx campanulate, 1.5--2 mm. long and wide, densely puberulent, its rim shortly toothed; corolla-tube about 3 mm. long, subglabrous, the limb densely puberulent on the outside, the lobes about 1 mm. long, obtuse.

The type of this species was collected by Joseph Charles Corneille Bequaert (no. 5592) in the Belgian Congo on September 8, 1914, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

PREMNA CORYMBOSA var. *MADAGASCARIENSIS* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis majoribus, laminis 7--13 cm. longis et 6--7 cm. latis, late ellipticis vel ovato-ellipticis, ad basim truncatis vel subcordatis, nitidulis, reticulo nervorum utrinque perspicue prominulo.

This variety differs from the typical form of the species in having more regularly larger leaves, the blades 7--13 cm. long and 6--7 cm. wide, broadly elliptic or ovate-elliptic, truncate or subcordate at the base, rather shiny, the vein and veinlet reticulation conspicuous and mostly prominulous on both surfaces.

The type of the variety was collected by Richard Baron (no. 2574) in central Madagascar in or before 1883, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

PREMNA MATADIENSIS Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus minute puberulis deinde glabrescentibus lenticellatis; foliis decussatis; petiolis 1--4 cm. longis sparsissime minuteque pilosulis; laminis membranaceis late ellipticis acuminatis dentatis utrinque glabratibus, ad basim rotundatis; inflorescentiis terminalibus cymosis multifloris 6plo furcatis puberulis.

Shrub; branches and branchlets slender, minutely puberulent on the younger parts and on the twigs, glabrescent in age, ob-

scurely tetragonal, the older parts gray, the younger parts brunnescent, lenticellate; nodes not annulate; principal internodes 0.5--3.5 cm. long; leaf-scars large, divaricately prominent; leaves decussate-opposite; petioles slender, 1--4 cm. long, flattened-sulcate above, very sparsely and minutely pilosulous; blades membranous, dark-green above, lighter beneath, broadly elliptic, 4--11 cm. long, 3.5--7.5 cm. wide, acuminate at the apex, coarsely and irregularly dentate above the middle, rounded at the base, practically glabrate on both surfaces; midrib slender, flat above, somewhat prominent beneath; secondaries very slender, 2--5 per side, arcuate-ascending, flat but quite distinct above, prominulous beneath, not plainly anastomosing; veinlet reticulation abundant, only the larger parts distinct above, flat but distinct beneath; inflorescence terminal, cymose, about 9.5 cm. long and 5 cm. wide, many-flowered, 6 or more times furcate; peduncles slender, about 3.5 cm. long, rather densely puberulent; cyme-branches rather densely puberulent; bractlets linear, 2--5 mm. long, minutely puberulous; pedicels about 1 mm. long, very slender, puberulous; fruiting-calyx shallowly cupuliform, about 3 mm. long, 5--6 mm. wide, puberulent, its rim shallowly 5-toothed or -scalloped; fruit drupaceous, subglobose, about 5 mm. long and wide, nigrescent in drying.

The type of this species was collected by Emile and Marcel Désiré Joseph Laurent at Matadi, Belgian Congo, in February, 1904, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

PRIVA HUMBERTI Moldenke, sp. nov.

Herba; caulibus ramisque gracilibus tetragonis densiuscule breviterque pubescentibus, pilis arcte divergentibus glanduloso-capitatis brevibus et aliis albidis multo longioribus non-capitatis; foliis decussatis; petioliis filiformibus dense glanduloso- et non-glanduloso-pubescentibus; laminis tenuiter membranaceis ovatis acutis irregulariter dentatis, ad basim subtruncatis et paulo subcuneatis, utrinque parce pilosis.

Herb; stems and branches slender, tetragonal, rather densely short-pubescent with widely divergent gland-tipped hairs and with scattered much longer whitish non-capitate hairs interspersed, more dense on the younger parts; nodes annulate; principal internodes 1.5--6 cm. long; leaves decussate-opposite; petioles filiform, 1.7--3.8 cm. long, densely glandulose-pubescent and non-glandulose-pilose like the branches; blades thin-membranous, bright green, lighter beneath, ovate, 2.5--5.5 cm. long, 1.5--4 cm. wide, acute at the apex, rather coarsely and irregularly dentate except at the very base, subtruncate at the base and slightly cuneately prolonged into the petiole at the center, scattered pilose on both surfaces, the hairs somewhat shorter beneath; midrib filiform, flat above, prominulous be-

neath; secondaries filiform, 4 or 5 per side, ascending, very slightly arcuate, flat and often obscure above, subprominulous beneath, not anastomosing; veinlet reticulation indiscernible above, obscure or almost indiscernible beneath; inflorescence terminal, racemiform, 6.5--8 cm. long; rachis filiform, rather densely glandulose-pubescent and non-glandulose-pilose like the branches; pedicels filiform, 1--2 mm. long, rather densely short-pubescent; calyx cylindric, about 3 mm. long and 1 mm. wide, plainly 5-costate, antrorsely pilose-ciliate on the ribs, otherwise densely glandular-puberulent, the rim r-apiculate; bractlets setaceous, 1--2 mm. long; corolla small, its tube narrow-cylindric, about 4 mm. long, its limb 2 mm. wide; cocci stramineous, glabrous, completely unarmed, without ridges or wrinkles.

The type of this species was collected by that most enthusiastic student of the Madagascar flora, Dr. Henri Humbert (no. 19942), in a trophophilous forest and xerophilous bush on calcareous rocks in the gorges of Fiherenana between Beantsy and Anjamala, altitude 30--300 m., Madagascar, between January 16 and 19, 1947, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

SABINA HORIZONTALIS f. PLUMOSA (Rehd.) Moldenke, comb. nov.

Juniperus horizontalis f. *plumosa* Rehd., Journ. Arnold Arb. 6: 204. 1925.

SYNGONANTHUS HUMBERTI Moldenke, sp. nov.

Herba parva acaulescens; foliis rosulatis numerosis adscendentibus vel patentibus lineari-filiformibus firmis 1--1.5 cm. longis glabris subulatis non fenestratis, ad basim a tomento albo pulviniformi circumdatis; vaginis gracillimis stramineis 1.5--2 cm. longis arcte adpressis parce patenteque capitato-pilosis; pedunculis numerosis gracilibus 4--23 cm. longis aureo-stramineis 3-costatis paulo tortis glabris (praeter apicem versus) nitidis; capitulis hemisphaericis vel deinde subglobosis brunneo-stramineis 4--5 mm. latis.

Small acaulescent herb; leaves rosulate, numerous, ascending or spreading, linear-filiform, firm, 1--1.5 cm. long, less than 0.5 mm. wide, glabrous but usually very densely surrounded with white tomentum at the base, subulate-tipped, not fenestrate; sheaths very slender, stramineous, 1.5--2 cm. long, conspicuously surpassing the leaves, closely appressed to the peduncle, more or less sparsely spreading-pilose with scattered capitate hairs standing at right angles to the sheath; peduncles mostly numerous, to 30 per plant, slender, 4--23 cm. long, golden-stramineous, 3-costate, slightly twisted, glabrous and shiny except at the more or less obscurely pilosulous apex; heads hemispheric or eventually subglobose, brownish-stramineous, 4--5 mm. wide; involucrel bractlets stramineous, numerous, conspic-

uous, elliptic-lanceolate, about 2 mm. long and 1 mm. wide, acute at the apex, glabrous; receptacle long-pilose; staminate florets: sepals 3, separate, ovate, stramineous, somewhat navicular, about 1.5 mm. long and 0.5 mm. wide, acute at the apex, minutely scattered-pilose on the margins and back; petals 3, connate into a hyaline tube about 0.8 mm. long, the free terminal portions minute, black-glanduliferous at the apex within; stamens 3, included; anthers white; pistillate florets: sepals 3, separate, navicular, narrow-elliptic or oblanceolate, about 1.5 mm. long and 0.4 mm. wide, subacute or obtuse at the apex, pilose on the margins and back with short ascending hairs; petals 3, connate into a hyaline pilose tube about 1 mm. long, separate at the base and apex; style short and relatively stoutish, stramineous, about 0.4 mm. long, glabrous; the 3 stigmas and 3 style-appendages filiform-setaceous, hyaline, erect, about 0.4 mm. long; ovary subglobose, about 0.5 mm. long and wide, glabrous, stramineous, 3-sulcate, 3-celled, 3-ovulate.

The type of this very distinct species was collected by Dr. Henri Humbert (no. 3487) in sandy rocky soil in clearings of the forest in the upper valley of the Rienana (basin of the Matitanana), altitude 1000--1400 m., Madagascar, between November 18 and 22, 1924, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

SYNGONANTHUS NIVEUS var. ROSULATUS (Körn.) Moldenke, comb. nov.

Paepalanthus niveus var. rosulatus Körn. In Mart., Fl. Bras. 3 (1): 435. 1863.

SYNGONANTHUS WEDDELLII Moldenke, sp. nov.

Herba caulescens; caulibus usque ad 15 cm. longis densiuscule albido-lanulosis omnino dense uniformiterque foliosis simplicibus; foliis graminoides adscendenti-subappressis, supremis paulo divergentibus, infimis reflexis, ca 2 cm. longis glabris non fenestratis; vaginis anguste cylindricis 3--4 cm. longis pilosis; pedunculis terminalibus 20--25 erectis gracillimis stramineis 22--36 cm. longis pilosis; capitulis hemisphaericis albis 5--9 mm. latis.

Caulescent herb; stems to 15 cm. long, rather densely white-lanulate among the leaf-bases, unbranched, densely and uniformly foliose throughout, the lowest leaves drying up and becoming reflexed in age; leaves grass-like, ascending-subappressed or the uppermost ones somewhat divergent, rather shiny, about 2 cm. long, about 1 mm. wide at the base, gradually narrowed to the obtuse apex, several-ribbed, glabrous on both surfaces, not fenestrate, rather firm except where reflexed; sheaths narrowly cylindrical, 3--4 cm. long, rather abundantly pilose with very thin, weak, divergent hairs, obliquely split at the apex, the blade erect, firm, lanceolate-ovate, 5--6 mm. long, more or less pilosulous, especially on the margins; peduncles 20--25 in

a cluster at the apex of the stem, erect, very slender, stramineous, 22--36 cm. long, scattered-pilose with very slender, weak, subappressed hairs except at the apex beneath the heads where they are spreading-erect and often clavate-tipped; heads hemispheric, white, 5--9 mm. wide; involucrel bractlets white, elliptic, about 2.5 mm. long and 1 mm. wide, acute at the apex, glabrous and shiny on both surfaces; receptacle pilose; receptacular bractlets none; staminate florets: sepals 3, separate, elliptic; hyaline, about 1.7 mm. long and 0.4 mm. wide, attenuate-acute at the apex, glabrous on both surfaces; petals 3, connate at the base, the free portions obovate, about 0.6 mm. long and 0.2 mm. wide, hyaline, glabrous; stamens 3, included; filaments filiform, white, about 0.17 mm. long; anthers small, white; pistillate florets: sepals 3, hyaline, lanceolate, about 2 mm. long and 0.6 mm. wide, attenuate-acuminate at the apex, glabrous on both surfaces; petals 3, hyaline, obovate-cuneate, about 1.5 mm. long and 0.5 mm. wide, 3-toothed and long-pilose at the apex, otherwise glabrous; style about 0.2 mm. long; stigmas 3, erect, about 0.3 mm. long; ovary globose, about 0.8 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this handsome species was collected by Hugh Algernon Weddell (no. 17, cat. no. 2725) in a marsh at Sertão da Amaroleite, Goyaz, Brazil, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

VERBENA ALATA f. *ALBA* Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white or whitish corollas.

The type of the form was collected by Anders Frederik Regnell (no. I.326) at Serra do Caldas, Minas Geraes, Brazil, on October 16, 1861, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA LACINIATA var. *CONTRACTA* (Lindl.) Moldenke, comb. nov.

Verbena multifida var. *contracta* Lindl., Bot. Reg. 21: pl. 1766. 1836.

VERBENA LACINIATA var. *SABINI* (Sweet) Moldenke, comb. nov.

Verbena erinoides var. *sabini* Sweet, Brit. Fl. Gard. 2: 347. 1838.

VERBENA PAULENSIS Moldenke, sp. nov.

Herba; caulibus gracilibus obtuse tetragonis dense hirsutopubescentibus, pilis sordido-griseis; foliis sessilibus vel subsessilibus ovatis subacutis, ad basim rotundatis vel truncatis, irregulariter dentatis, utrinque densiuscule hirsutulo-pubescentibus; inflorescentiis terminalibus subcapitatis dense multifloris; pedunculis abbreviatis dense hirsutulo-pubescenti-

bus; bracteolis anguste lanceolatis attenuatis pubescentibus.

Herb; stems slender, obtusely tetragonal, densely hirsute-pubescent with sordid-grayish hairs; nodes not annulate; principal internodes 0.8—2.5 cm. long; leaves decussate-opposite, sessile or practically so, ovate, 1.5—2.5 cm. long, 1.2—2.2 cm. wide, subacute at the apex, rounded or truncate at the base, coarsely and irregularly dentate along the margins, the lowest teeth almost lobe-like, rather densely hirsutulous-pubescent on both surfaces, especially beneath; midrib slender, impressed above, prominulous beneath; secondaries filiform, 4—7 per side, the lower ones issuing palmately from the base of the blade, impressed above, prominulous beneath, ascending, hardly arcuate; veinlet reticulation rather abundant, impressed above, prominulous beneath; inflorescence terminal, the spikes subcapitate, densely many-flowered, about 2 cm. long and wide during anthesis, sometimes with 2 or a few flowers slightly separate from the main head; peduncles abbreviated, mostly 1—1.5 cm. long, densely hirsutulous-pubescent; bractlets narrowly lanceolate, 7—8 mm. long, 1—1.5 mm. wide at the base, densely pubescent, attenuate at the apex; calyx cylindric, about 9 mm. long, strongly 5-costate, densely hirsutulous-pubescent or hirsutulous on the outside, its rim irregularly 5-subulate-toothed; corolla hypocrateriform, showy, its tube about 1 cm. long, very sparsely pilosulous on the outside, the limb almost 1 cm. wide.

The type of this species was collected by Edwin Friderichs (no. 27901) in thickets at Campos do Jordão, São Paulo, Brazil, in January, 1944, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre.

VERBENA RAMBOI Moldenke, sp. nov.

Herba ca. 30 cm. alta; caulibus ut videtur simplicibus erectis acute tetragonis sulcatis pilosis; foliis sessilibus vel subsessilibus chartaceis elliptico-lanceolatis attenuato-acutis crasse incisus vel inciso-serratis parcellissime pilosis, ad basim attenuato-angustatis; inflorescentiis terminalibus; pedunculis gracilibus acute tetragonis albido-hirsutulis.

Herb, apparently about 30 cm. tall; stems apparently simple, erect, acutely tetragonal, sulcate between the angles toward the apex, more or less scattered-pilose especially on the often margined angles, the hairs between the angles much more minute and appressed, those on the angles white, spreading or reflexed; nodes not annulate; principal internodes 1.5—2 cm. long; leaves decussate-opposite, sessile or practically so; blades rather grayish-green on both surfaces, chartaceous, elliptic-lanceolate in outline, 2—4.5 cm. long, 5—10 mm. wide, attenuate-acute at the apex, long-attenuate to the base, coarsely incised or incised-serrate with 3—5 teeth on each side at the middle broader portion of the leaf (the larger and lowest lobe-

like teeth often again toothed), very sparsely scattered-pilose above with stiff white appressed hairs, more densely so on the larger venation beneath; midrib slender, impressed above, prominent beneath; secondaries slender, about 3 per side, impressed above, prominulous beneath, not extending directly to the tips of the teeth or lobes, but branching early, with branches extending into the teeth; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, composed of 3 abbreviated spikes; peduncles slender, 1 cm. long or less, acutely tetragonal, whitish-hirsutulous; floriferous portion of the spikes subcylindric, 1--2 cm. long, about 1 cm. wide during anthesis, very densely many-flowered; bractlets lanceolate-ovate, about 5 mm. long, 1 mm. wide at the base, long-attenuate at the apex, subulate-tipped, glabrate except for the long-ciliate margins; calyx cylindric, about 8 mm. long, conspicuously 5-ribbed and white-hirsutulous on the ribs, the rim irregularly subulate-toothed.

The type of this species was collected by my good friend and colleague, Padre Balduin Rambo (no. 25787), in bushy fields at Fazenda Santa Cecilia, near São Gabriel, Rio Grande do Sul, Brazil, on January 15, 1944, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre. Padre Rambo is doing a tremendously valuable work on the flora of Rio Grande do Sul and deserves the highest praise and compliment for his success in building up the important Herbarium Anchieta.

VITEX AUREA Moldenke, sp. nov.

Arbor parva; ramis ramulisque griseis plusminusve ferrugineo-tomentellis deinde glabrescentibus; sarmentis densissime tomentello-pubescentibus, pilis flavidis vel ferrugineis; foliis decussatis 1-foliolatis; petiolis crassiusculis dense flavido-tomentellis; laminis firme chartaceis vel subcoriaceis ellipticis vel obovatis integris utrinque tomentello-pubescentibus, supra deinde glabrescentibus; inflorescentiis axillariibus cymosis sub-multifloris; pedunculis 1--3 cm. longis.

Small tree to 8 m. tall; branches and branchlets medium-slender, grayish, very obtusely tetragonal or subterete, more or less ferruginous-tomentellous, glabrescent in age; twigs very densely tomentellous-pubescent with yellowish or ferruginous hairs; nodes often obscurely annulate; principal internodes 0.5--5 cm. long, mostly much abbreviated on the twigs; leaves decussate-opposite, 1-foliolate; petioles stoutish, 0.5--2 cm. long, flattened and sulcate above, densely tomentellous with yellowish or ferruginous hairs; blades firmly chartaceous or subcoriaceous, much lighter beneath, elliptic or obovate, 4--9 cm. long, 1.5--6.5 cm. wide, varying from rounded to obtuse or abruptly acute at the apex, entire, varying from rounded to acute at the base, more or less tomentellous-pubescent on both surfaces, becoming glabrescent above, the hairs flavidous or

ferruginous; midrib slender, flat or subimpressed above, prominent beneath; secondaries slender, 8—10 per side, ascending, slightly arcuate toward the margins, flat above, prominent beneath; veinlet reticulation abundant, obscure or indiscernible above, very prominent beneath; inflorescence axillary, cymose, mostly shorter than the subtending leaves, rather many-flowered; peduncles rather slender, 1—3 cm. long, flattened, densely flavidous-tomentellous; cyme-branches mostly abbreviated, densely flavidous-tomentellous; pedicels mostly obsolete; bractlets numerous, linear, 2—5 mm. long, densely yellow-tomentellous, conspicuous, firm; calyx campanulate, 3—4 mm. long and wide, very densely golden-tomentellous on the outside, its rim truncate and subentire; corolla-tube cylindric, 1.2—1.5 cm. long, slightly *curvate*, very densely golden-villous on the outside, the lobes about 2 mm. long, erect; stamens and pistil exerted about 5 mm. from the corolla-tube.

The type of this beautiful species was collected by Henri Perrier de la Bâthie (no. 16317) in a forest at about 2000 m. altitude, Mount Tramtanana, Madagascar, in April, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX BEFOTAKENSIS Moldenke, sp. nov.

Frutex; ramulis gracilibus griseis obtuse tetragonis glabris; sarmentis canescenti-puberulis; foliis decussatis 1-foliolatis; petiolis minute canescenti-puberulis vel glabrescentibus; laminis firme chartaceis ellipticis vel ovato-ellipticis integris utrinque glabris nitidisque; cymis 1—3-floris.

Shrub; branchlets slender, gray, obtusely tetragonal, glabrous; twigs very slender, light-gray, the youngest parts canescent-puberulous, the older parts glabrescent; nodes not annulate; principal internodes 0.5—3 cm. long; leaves decussate-opposite, 1-foliolate; petioles slender, 6—9 mm. long, flattened above, minutely canescent-puberulous or glabrescent; blades rather firmly chartaceous, rather uniformly bright-green on both surfaces, somewhat nigrescent in drying, elliptic or ovate-elliptic, 3.5—8.5 cm. long, 3—4 cm. wide, varying from rounded or obtuse on smaller leaves to acute or very shortly acuminate on larger ones, entire, varying from rounded to acute or short-acuminate at the base, glabrous and shiny on both surfaces; midrib slender, flat above, prominent beneath; secondaries filiform, 4—6 per side, ascending, mostly flat above, very slightly prominulous beneath, anastomosing in shallow loops several mm. from the margins beneath; veinlet reticulation rather sparse, obscure or indiscernible above, obscure beneath; inflorescence axillary, cymose, much shorter than the subtending leaves; cymes 1—3-flowered; peduncles filiform, 3—10 mm. long, rather densely whitish-strigillose with closely appressed antrorse hairs; bractlets lanceolate-ovate, 2—3 mm.

long, about 1 mm. wide, densely cinereous-strigose, 1-3 pairs per cyme; pedicels filiform, 3-9 mm. long, densely cinereous-strigillose; calyx campanulate, about 5 mm. long and 4 mm. wide, 5-toothed, the tube densely cinereous-strigillose, the teeth 1-1.5 mm. long, less densely strigillose and mostly conspicuously nigrescent in drying, acute or subacute at the apex, minutely strigillose within; corolla clear-pink, curvate-cylindric, densely brownish-villosulous on the outside, the tube 10-13 mm. long, the lobes about 2 mm. long; fruiting-calyx thin-textured, nigrescent in drying, cupuliform, to about 7 mm. long and wide, sparsely and minutely strigillose, its rim plainly 5-toothed.

The type of this species was collected by Raymond Decary (no. 4757) at Befotaka, in the province of Farafangana, Madagascar, on September 11, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX BERAVIENSIS var. ACUMINATA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit ramulis manifeste tetragonis minute puberulis; foliis 5- vel 6-foliolatis; petiolis longioribus minute puberulis; petiolulis usque ad 4 cm. longis; laminis usque ad 14.5 cm. longis longe acuminatis; inflorescentiis omnino minute puberulis.

This variety differs from the typical form of the species in having its branchlets plainly tetragonal and minutely puberulous; the leaves 5- or 6-foliolate; petioles slightly longer and minutely puberulous; petiolules to 4 cm. long; leaflet-blades to 14.5 cm. long and long-acuminate; and the inflorescences minutely puberulent throughout; fruit about 2 cm. long and 1.5 cm. wide.

The type of this variety was collected by Henri Perrier de la Bâthie (no. 1595 bis) in sandy woods at Manonyarivo, Ambongo, Madagascar, in August, 1905, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX BERAVIENSIS f. PILOSA Moldenke, f. nov.

Haec forma a forma typica speciei recedit calyce plusminusve adpresso-pilosis et petiolis petiolulisque ramulisque inflorescentiae foliisque subtus sarmentisque etiam plusminusve piloso-puberulentis.

This form differs from the typical form of the species in having the calyx more or less appressed-pilose during and before anthesis and often even after anthesis, and in having the petioles, petiolules, inflorescence-branches, lower leaf-surfaces, and young twigs also more or less pilose-puberulent.

The type of the form was collected by Grevé (no. 65) at Morondava, Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It is hoped that more material of these novelties will soon be available.

VITEX BERAVIENSIS f. *VILLOSA* Moldenke, f. nov.

Haec forma a forma typica speciei recedit calyce bracteolis-que dense villosis, pilis sordido-canescens, petiolis petiolulisque pedunculisque ramisque inflorescentiae sarmentisque plerumque densiuscule puberulis vel breviter pubescentibus, et laminis foliorum subtus plusminusve puberulenti-pilosis.

This form differs from the typical form of the species in having the calyx and bractlets densely villous with sordid-canescens hairs; also in having the petioles, petiolules, peduncles, inflorescence-branches, and young twigs usually rather densely puberulent or short-pubescent and the lower leaf-surfaces more or less puberulent-pilose.

The type of this form was collected by Henri Humbert (no. 19711) at Anapaly, near Manera, in the valley of the Ianapaly, an affluent of the Fiherenana, Madagascar, at an altitude of 300 m., on December 13, 1946, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX BOJERI var. *SUBORBICULARIS* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum coriaceis 1.5--3 cm. longis latisque truncatis vel emarginatis, subtus leviter obscureque puberulis.

This variety differs from the typical form of the species in having its leaf-blades coriaceous, 1.5--3 cm. long and wide, truncate or emarginate at the apex (rarely mucronulate-acute), very lightly and obscurely puberulent beneath, eventually more or less glabrescent except for the larger venation, densely resinous-punctate beneath; calyx puberulent, lobed to the middle, the lobes 2 mm. long.

The type of this variety was collected by Henri Humbert (no. 22624) in licheniferous woods on gneiss and quartzite on the eastern slopes of Massif de Marojejy west of the Manantenina river, an affluent of the Lokoho, Madagascar, between December 15 and 25, 1948, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX CHRYSOMALLUM var. *LONGICALYX* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit calyce sub anthesin ca. 7 mm. longo dense villosa et foliolis centralibus usque ad 10 cm. longis.

This variety differs from the typical form of the species in having its calyx during anthesis about 7 mm. long, densely villosa, and the central leaflets to 10 cm. in length.

The type of the variety was collected by Henri Perrier de la Bâthie (no. 10224) at an altitude of about 500 m., Massif de Manongarivo, Madagascar, in May, 1909, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX CHRYSOMALLUM var. *TOMENTELLA* Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum subtus dense aureo-tomentellis, indumento adpresso, recedit.

This variety differs from the typical form of the species in having the lower leaf-surfaces densely golden-tomentellous with appressed indumentum.

The type of the variety was collected by M. Thouvenot (no. 150) at Analamazaotra, Madagascar, in 1919, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX CAULIFLORA Moldenke, sp. nov.

Frutex; foliis ut videtur 1-foliolatis; petiolis glabris; laminis subcoriaceis ellipticis acuminatis integris subrevolutis, ad basim acutis vel subcuneatis, utrinque glabris; inflorescentiis ut videtur caulifloris fasciculatis sessilibus; pedicellis densissime brunneo-strigosis; calyce dense strigoso.

Shrub 4--5 m. tall; bark on stems apparently glabrous, light-gray; branches and branchlets not known; leaves presumably 1-foliolate; petioles slender, 1.8--2.8 cm. long, glabrous; blades subcoriaceous, rather uniformly dark-green on both surfaces, very shiny beneath, elliptic, 8--14 cm. long, 3--5 cm. wide, acuminate at the apex, entire and somewhat revolute along the margins, acute or somewhat cuneate at the base, glabrous on both surfaces; midrib slender, impressed above, very prominent beneath; secondaries very slender, 7--10 per side, arcuate-ascending, flat or very slightly subimpressed above, sharply prominent beneath, rather indistinctly arcuate-joined at the margins beneath; veinlet reticulation mostly obscure or indiscernible on both surfaces; inflorescence apparently cauliflorous, in small dense fascicles, sessile; pedicels very slender, about 5 mm. long, very densely strigose with sordid-brownish or grayish antrorse hairs; bractlets linear, 2--4 mm. long, densely strigose on one surface, glabrous on the other surface; calyx campanulate, herbaceous, 6--7 mm. long, about 5 mm. wide, densely strigose with sordid-yellowish or grayish antrorse hairs throughout, its rim deeply 5-lobed, the lobes triangular-ovate, attenuate-acuminate at the apex, 3--4 mm. long, equally strigose on the outside as the tube, their bases contiguous; corolla tubular, red or red-orange, 2--2.5 cm. long, incurved, glabrous at the base, rather densely spreading-hirsute with ferruginous hairs above the tips of the calyx-teeth, gradually ampliate to 6 mm. at the apex, the lobes spreading, 3--4 mm. long; stamens and style exerted less than 1 cm. from the corolla-mouth.

The type of this species was collected by Henri Perrier de la Bâthie (no. 10311) in woods at an altitude of 400 m. in the neighborhood of the bay of Anlongol, Madagascar, in August, 1912, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX CAULIFLORA var. *LONGIFOLIA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum 29--43 cm. longis, 5--8 cm. latis, petiolicis 4--5.5 cm. longis, et calyce parce strigilloso.

This variety differs from the typical form of the species in having the leaf-blades 29--43 cm. long, 5--8 cm. wide, petioles 4--5.5 cm. long, and the calyxes only lightly strigillose, less so on the lobes, the lobes separated by distinct sinuses at the base.

The type of the variety was collected by Leon Humblot (no. 90) at Passimbé, in northern Madagascar, on December 27, 1881, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX CAULIFLORA var. *VILLOSISSIMA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit pedicellis calyceque sub anthesin omnino albedo-pubescentibus, dentibus calycis 1.5--2 mm. longis, et corollis densissime albidovillosis.

This variety differs from the typical form of the species in having its pedicels and calyxes in anthesis densely albidous-pubescent throughout, the calyx-teeth only 1.5--2 mm. long, and the corollas very densely albidous-villous. The leaves are not known and may well show other differentiating characters.

The type of the variety was collected at Anony, in the northern forest of the country of the Sihanaka, Madagascar, on September 3, 1937, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX COURSI Moldenke, sp. nov.

Arbor; ramis brunneo-velutinis; ramulis crassis obtuse tetragonis densissime brunneo-velutinis; foliis 9-foliolatis; petiolicis crassiusculis firmis ca. 19.5 cm. longis dense brunneo-pubescentibus vel velutinis; petiolulis inaequalibus elongatis dense brunneo-pubescentibus vel hirsutulovelutinis; laminis subcoriaceis anguste oblanceolatis supra glabris, subtus velutino-pubescentibus, usque ad 25 cm. longis, 5.3 cm. latis acuminatis integris undulatis, ad basim breviter acuminatis et revolutoinflexis; cymis axillaribus sessilibus dense congestis.

Tree 5--10 m. tall; branches very brown-velutinous; branchlets stout; obtusely tetragonal, very densely brown-velutinous, slightly canaliculate; principal internodes apparently much elongated, 7 or more cm. long; leaves decussate-opposite, 9-foliolate; petioles rather stout, firm, about 19.5 cm. long, densely brown-pubescent or velutinous; petiolules rather slender, unequal, elongate, the central ones to 3.5 cm. long, the lower ones about 1 cm. long, all densely brown-pubescent or hirsutulous-velutinous; leaflets subcoriaceous, dark-green above when fresh, rather uniformly colored on both surfaces when

dry, long and narrow, oblanceolate, the largest one 5-6 times as long as wide, glabrous (except for the midrib) and shiny above, rather sparsely velutinous-pubescent beneath with brown hairs, the central ones 21-25 cm. long and 4.4-5.3 cm. wide, acuminate at the apex, entire but often more or less undulate along the margins, mostly short-acuminate at the base with the margins strongly revolute or inflexed there, the lower ones 15-20 cm. long and 3-4.3 cm. wide, sometimes asymmetric at the base; midrib slender, impressed above, very prominent beneath, densely brown-hirsutulous on both surfaces; secondaries slender, 12-15 per side, mostly obscure or indiscernible above, sharply prominent beneath, divaricate-ascending, irregularly arcuate-anastomosing in many irregular loops near the margins beneath; veinlet reticulation very abundant, indiscernible above, prominent to the ultimate divisions beneath, irregular; inflorescence axillary, the cymes sessile or subsessile, very densely congested and many-flowered; peduncles and cyme-branches obsolete or very short and densely fulvous-villous; pedicels slender, 5-8 mm. long, very densely fulvous-villous; bractlets linear or oblong, about 5 mm. long, very densely fulvous-villous on both surfaces, mostly hidden in the inflorescence-pubescence; calyx cyathiform, garnet-red, about 6 mm. long and 5 mm. wide, very densely fulvous-villous with antrorsely appressed or subappressed velutinous hairs, the rim subtruncate, very shortly 5-dentate; corolla tubular, incurved, 2-2.5 cm. long, wine-red, very densely villous on the outer surfaces with long antrorsely subappressed silvery hair, the tube about 2 mm. wide at the base and 6 mm. wide at the apex, the lobes 2-2.5 mm. long, erect; stamens and pistil red, exerted about 5 mm. from the corolla at anthesis; anthers brown.

The type of this very distinct species was collected by G. Cours (no. 180) at Ankarota, altitude 1300 m., Ambatondrazaka district, Madagascar, on January 31, 1938, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX ELAKELAKENSIS Moldenke, sp. nov.

Arbor; ramulis obtusissime tetragonis dense flavescenti-villosis deinde flavo-puberulis; foliis 5-7-foliolatis; petiolis dense flavescenti-hirsutis; petiolulis usque ad 7 mm. longis dense flavescenti-hirsutulis; foliolis chartaceis oblanceolatis obtusis vel acutis, ad basim cuneato-atenuatis, valde dentatis, utrinque dense hirsutulis.

Tree; branchlets rather slender, very obtusely tetragonal, densely flavescant-villous on younger parts, merely yellow-puberulent in age; nodes not annulate; principal internodes 1.5-4 cm. long; leaves decussate-opposite, 5-7-foliolate; petioles rather slender, 3-6.5 cm. long, densely hirsute with long flavescant hairs, less densely so in age; petiolules vary-

ing in length, those on the lowest leaflets subobsolete, on central ones 3--7 mm. long and densely flavescent-hirsutulous; leaflets chartaceous, gray-green on both surfaces, brunnescent in drying when immature, oblanceolate, obtuse or acute at apex, cuneate-attenuate at the base, conspicuously and coarsely dentate from the apex to below the middle with broadly ovate rather blunt or subacute teeth, more or less densely hirsutulous on both surfaces when young, less densely so when mature or merely hirsutulous-pilose on the larger venation above and more densely so beneath, the hairs coarse, spreading, and flavescent-brownish, the central leaflets 8--12 cm. long and 2--3.3 cm. wide, the lower ones much smaller; midrib slender, flat and usually quite densely yellow-hirsutulous above, prominent beneath and conspicuously villous-hirsute; secondaries filiform, 10--15 per side, short, ascending, hardly arcuate, terminating at the apices of the teeth, flat or often very obscure above, prominent beneath; veinlet reticulation rather abundant, usually indiscernible above and prominulous beneath; inflorescence not seen.

The type of this species was collected by Henri Humbert (no. 13836 bis) on the western slopes of the mountains between Andohahela and Elakelaka, in the basin of the Mananara, an affluent of the Mandrare, altitude 800--900 m., Madagascar, in January or February, 1934, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is possible that the type specimens is from a watersprout and that the foliar characters given above may, therefore, not be characteristic of the species.

VITEX FARAFANGANENSIS Moldenke, sp. nov.

Frutex; ramulis crassiusculis ad nodos plusminusve piloso-puberulis alibi glabrescentibus; foliis 1-foliolatis; petiolis crassis articulatis plusminusve piloso-puberulis vel glabrescentibus; laminis chartaceis firmis anguste ellipticis vel oblanceolatis acuminatis integris, ad basim acutis, supra parce pilosis vel glabrescentibus, subtus in reticulo plusminusve hirsutis vel glabrescentibus; inflorescentiis axillaribus sessilibus fasciculato-glomeratis multifloris.

Shrub, to about 6 m. tall; stems about 10 cm. in diameter; branchlets stoutish, apparently obtusely tetragonal, longitudinally wrinkled in drying, more or less pilose-puberulent at the nodes, glabrescent elsewhere; nodes apparently annulate; principal internodes much abbreviated, about 0.5 mm. long; leaves decussate-opposite, 1-foliolate; petioles stout, jointed at the apex, longitudinally wrinkled in drying, 1--5 cm. long, more or less pilose-pubescent or glabrescent; blades chartaceous, firm, narrow-elliptic or oblanceolate, 15--42 cm. long, 3--5.3 cm. wide, acuminate at the apex, entire, acute at the base, scattered-pilose above or glabrescent, more or less hir-

sute along the midrib and secondaries beneath or glabrescent; midrib slender, flat or subimpressed above, coarsely prominent beneath; secondaries very slender, 2--20 per side, arcuate-ascending, obscure or indiscernible above, prominulous beneath, anastomosing in many loops near the margins beneath; veinlet reticulation sparse, indiscernible above, slightly subprominulous beneath; inflorescence axillary, sessile or subsessile, fasciculate-glomerate, rather many-flowered; peduncles obsolete; pedicels filiform, 5--8 mm. long, densely hirsute with ferruginous hairs; calyx campanulate, membranous, bright-rose when fresh, nigrescent in drying, deeply lobed to the middle or beyond, the tube about 5 mm. long, hirsute with ferruginous hairs, the 5 lobes elongate-ovate, about 5 mm. long, long-attenuate to the apex, sparsely scattered-hirsute on the outside; corolla yellowish, cylindric, arched, about 1.5 cm. long, rather densely hirsute with ferruginous hairs, the lobes about 3 mm. long; stamens and pistil exerted 4--5 mm. from the corolla-tube; fruiting-calyx not enlarged, about 1 cm. long, hirsutulous, the rim deeply 5-lobed, including the drupaceous subglobose fruit.

The type of this distinctive species was collected by Raymond Decary (no. 5376) at Vondrozo, in the province of Farafangana, Madagascar, on September 16, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX GRANDIDIANA var. ANGUSTIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis anguste oblongo-ellipticis vel oblanceolatis 1--2.3 cm. latis, ad basim attenuato-acutis vel cuneatis, apicem versus saepe plusminusve dentatis.

This variety differs from the typical form of the species in having its leaves narrowly oblong-elliptic or oblanceolate, attenuate-acute or cuneate at the base, often more or less dentate toward the apex, 1--2.3 cm. wide.

The type was collected by Martin François Geay (no. 6702) between Fort Dauphin and Santa Luce, in the province of Fort Dauphin, Madagascar, in 1909 or before, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX HUMBERTI Moldenke, sp. nov.

Arbor; ramulis dense fulvo-villosis, pilis subadpressis antrorsis, deinde glabrescentibus; foliis 3--5-foliolatis; petiolis crassiusculis dense adpresso-villosulis, pilis fulvis ant-rorsis; petiolulis dense adpresso-villosulis; laminis subcoriaceis ellipticis vel obovatis plerumque rotundatis vel emarginatis integris subrevolutis, ad basim acutis vel obtusis, supra valde bullatis, utrinque scabrido-pubescentibus; inflorescent-

is axillaribus subsessilibus paucifloris ubique dense fulvo-villosis.

Tree; branchlets medium-stout, densely fulvous-villous with subappressed antrorse hairs on the younger parts, glabrescent in age; nodes not annulate; principal internodes apparently abbreviated; leaves decussate-opposite, 3-5-foliolate; petioles rather stout, 3.5-6 cm. long, densely appressed-villosulous with antrorse fulvous hairs, decidedly flattened above; petioles unequal, the central one 8-14 mm. long, decidedly appressed-villosulous like the petioles, flattened and sulcate above, the lateral ones 1-5 mm. long; blades rather uniformly gray-green on both surfaces, subcoriaceous, elliptic or obovate, unequal in size, the central ones 6.5-9 cm. long, 3.5-4.5 cm. wide, mostly rounded or emarginate at the apex, varying to very bluntly short-mucronate, entire and slightly revolute along the margins, acute or obtuse at the base, conspicuously bullate above, scabridous-pubescent above and beneath, the lateral ones smaller and often asymmetric at the base; midrib slender, deeply impressed and villosulous above, very stout and prominent and fulvous-villosulous beneath; secondaries slender, 6-9 per side, slightly arcuate-ascending, deeply impressed above, very sharply prominent beneath, arcuately joined in many irregular loops near the margins; larger parts of the veinlet reticulation deeply impressed above and sharply prominent beneath; inflorescence axillary, subsessile, rather few-flowered, very densely fulvous-villous throughout; peduncles not more than 5 mm. long; cyme-branches much abbreviated; bractlets linear-subulate, to 5 mm. long, densely villosulous; calyx turbinate, about 4 mm. long and 2.5 mm. wide, densely fulvous-villosulous, its rim very shortly dentate; corolla cylindric, its tube 2-2.3 cm. long, incurved, about 5 mm. wide at the apex, glabrous at the base but densely spreading-villous with fulvous hairs on the part above the calyx, the lobes about 3 mm. long; the 4 stamens and style exerted about 5 mm. from the corolla-tube.

The type was collected by my very good friend and colleague, Dr. Henri Humbert (no. 23793) -- in whose honor it is named -- among ericaceous vegetation on the east summit of Massif de Marojijy, altitude about 1700 m., Madagascar, on March 25 or 26, 1949, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX HUMBERTI var. ANGUSTATA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum tenuiter membranaceis anguste oblanceolatis ad apicem basinque longe acuminatis, subtus in reticulo minus villosulis.

This variety differs from the typical form of the species in having thin-chartaceous leaflet-blades, at least the central ones narrowly oblanceolate and long-acuminate at both apex and

base, and less densely villosulous on the larger venation beneath.

The type was collected at Anony, Forêt du Nord, in the Shinaka country, Madagascar, on September 3, 1937 [Herb. Jardin Botanique de Tananarive 2944], and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX LASTELLEI Moldenke, sp. nov.

Frutex vel arbor; ramulis obtuse tetragonis saepe leviter sulcatis dense villosulo-tomentellis, pilis flavidis vel brunneo-ferrugineis, deinde subglabrescentibus; foliis 1-foliolatis; petiolis dense villosulo-hirsutis vel tomentellis; laminis chartaceis ellipticis breviter acuminatis integris, ad basim acutis, supra plusminusve parce pilosis, subtus densiore pubescentibus; inflorescentiis axillaribus sessilibus glomeratis.

Shrub or tree; branchlets medium-slender, obtusely tetragonal, often shallowly sulcate between the angles, densely villosulous-tomentellous on the younger parts, the hairs yellowish or brownish-ferruginous, becoming less so or even glabrescent in age; twigs flattened, very densely villosulous or tomentellous with yellowish or brownish-ferruginous hairs; nodes annulate; principal internodes variable in length, 1--9.5 cm. long; leaves decussate-opposite, 1-foliolate; petioles rather slender, 1--1.5 cm. long, flattened and canaliculate above, densely villosulous-hirsute with yellowish hair or tomentellous with brownish-ferruginous hairs; blades chartaceous, uniformly bright-green on both surfaces, shiny above, elliptic, 4.5--14.5 cm. long, 2--5.5 cm. wide, short-acuminate at the apex, entire, acute at the base, more or less sparsely pilose above, more densely pubescent beneath (especially on the larger venation); midrib slender, impressed above, very prominent beneath; secondaries slender, 5--8 per side, arcuate-ascending, impressed above, sharply prominent beneath, conspicuously anastomosing in shallow loops several mm. from the margins; veinlet reticulation rather abundant, the larger parts impressed above and prominent beneath; inflorescent axillary, sessile, glomerate, rather few-flowered; peduncles and pedicels obsolete; bractlets completely hidden by the pubescence; calyx campanulate, 3--4 mm. long, 4--5 mm. wide, very densely villous, its rim 5-toothed; corolla cylindric, arched, about 1 cm. long, densely villous on the outside, the lobes 1--2 mm. long, erect; stamens and pistil exerted about 5 mm. from the corolla-tube; fruiting calyx cupuliform, about 5 mm. long and 8 mm. wide, very densely villous with brownish or ferruginous hairs, its rim rather shallowly 5-toothed; fruit drupaceous, oblong, 8--10 mm. long, about 6 mm. wide, not fleshy, glabrous, shiny.

The type of this species was collected by M. de Lastelle (marked "A" on the label) somewhere in Madagascar in 1841, and is deposited in the herbarium of the Muséum National d'Histoire

Naturelle at Paris.

VITEX LEANDRII Moldenke, sp. nov.

Frutex; ramulis crassiusculis griseis dense adpresso-puberulis, pilis sordido-flavidis, deinde glabrescentibus; foliis 3--5-foliolatis; petiolis adpresso-puberulis, pilis sordido-flavidis; petiolulis adpresso-puberulis; laminis tenuiter chartaceis vel submembranaceis brunnescentibus late ellipticis obtusis vel rotundatis integris, ad basim saepe asymmetricis rotundatis, supra glabris, subtus pilosulo-puberulis; inflorescentiis axillaribus cymosis subpaucifloris laxissimis.

Shrub 4--5 m. tall; branchlets rather stoutish, gray, densely appressed-puberulent with sordid-yellowish hairs on the youngest parts, soon glabrescent; nodes not annulate; principal internodes 2--4 cm. long; leaf-scars very large, circular, flattened, not at all elevated; buds very small; leaves decussate-opposite, 3--5-foliolate; petioles rather stoutish, conspicuously flattened above, 4--7 cm. long, appressed-puberulent with sordid-yellowish hairs; petiolules slender, irregular in length, those on the central leaflets to 16 mm. long, those on the lateral leaflets 3--4 mm. long, appressed-puberulent; leaflet-blades thin-chartaceous or submembranous, brunnescent in drying, broadly elliptic, apparently about 8--9 cm. long and 4.5--5.5 cm. wide, apparently obtuse or rounded at the apex (but most of the leaflets on the type are abnormal at apex), entire, rounded and often asymmetric at the base, glabrous above, more or less pilosulous-puberulent beneath, more densely so on the larger venation; midrib slender, flat above, prominent beneath; secondaries filiform, 8--10 per side, divaricate-ascending, rather straight, flat above, prominulous beneath, irregularly and inconspicuously arcuate-joined in many small loops near the margins beneath; veinlet reticulation mostly obscure above, only the largest parts subprominulous beneath; inflorescence axillary, about equaling the subtending petioles, rather few-flowered, very lax and open, dichotomously cymose; peduncles compressed, 2--2.5 cm. long, rather densely appressed-puberulent with sordid-flavescent hairs, brunnescent in drying; cyme-branches elongate, brunnescent in drying, flattened, 6--8 mm. long, rather sparsely appressed-puberulent; pedicels filiform, 5--6 mm. long, brunnescent, sparsely puberulent; bractlets numerous, conspicuous, foliaceous, elliptic-oblancheolate, 8--15 mm. long, 2--5 mm. wide, glabrate above, densely yellowish-puberulent beneath, the uppermost ones linear, 5--6 mm. long and about 1 mm. or less wide; calyx campanulate, herbaceous, brunnescent in drying, about 8 mm. long, somewhat zygomorphic, rather densely appressed-puberulent with sordid-yellowish antrorse hairs outside, deeply 2-lipped to about the middle, 3 of the lobes more or less connate and 4 mm. long, the other 2 lobes separate, ovate, attenuate-acute at the apex, a-

bout 3 mm. long; corolla tubular, small, incurved, densely appressed-villous with sordid-silvery antrorse hairs, the tube about 1 cm. long, about 4 mm. wide at the apex, the lobes minute, about 1 mm. long; stamens and pistil exserted about 8 mm. from the corolla-mouth; fruiting-calyx enlarged, campanulate, to 1 cm. long, brunnescent, appressed-puberulent, deeply lobed and irregularly split; fruit drupaceous, globose, 6--7 mm. long and wide, glabrous, shiny, wrinkled in drying.

The type of this species was collected by Jacques Leandri (no. 550) at Andranoboka, Tsingy du Bemaraha, 9th Reserve, Madagascar, on November 21, 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX LOBATA Moldenke, sp. nov.

Frutex; ramis ramulisque gracillimis obtusissime subtetragonis vel subteretibus sarmentosis minute puberulis vel glabrescentibus; sarmentis densissime puberulis; foliis 1-foliolatis; petiolis filiformibus minute puberulis; laminis membranaceis ellipticis vel ovatis acutis vel obtusis, ad basim obtusis vel rotundatis, irregulariter lobatis vel inciso-dentatis, utrinque minute puberulis et densiuscule resinoso-punctatis; inflorescentiis axillaribus 1-floris minute puberulis.

Shrub, about 2 m. tall; branches and branchlets very slender, very obtusely subtetragonal or subterete, light-gray, minutely puberulent or glabrescent, twiggy; twigs very slender, grayish, densely puberulent; nodes not annulate; principal internodes very variable, 0.3--5 cm. long; leaves decussate-opposite, 1-foliolate; petioles filiform, 5--10 mm. long, minutely puberulent; blades membranous, brunnescent in drying, lighter beneath, elliptic or ovate, 1--3.5 cm. long, 7--17 mm. wide, acute or obtuse at the apex, mostly obtuse or rounded at the base, irregularly lobed or incised-dentate along the margins, very lightly and minutely puberulous and rather densely resinous-punctate on both surfaces; midrib very slender, flat above, slightly prominulous beneath; secondaries 3--5 per side, arcuate-ascending, mostly indiscernible above, slightly subprominulous beneath; veinlet reticulation mostly indiscernible on both surfaces; inflorescence axillary, 1-flowered; peduncles filiform, 1--1.5 cm. long, minutely puberulent; pedicels filiform, 8--12 mm. long, minutely puberulent; bractlets one pair, linear-setaceous, at the apex of the peduncle, 1--1.5 mm. long, minutely puberulent; calyx campanulate, 2--3 mm. long and wide, minutely puberulous and resinous-punctate on the outside, its rim minutely 5-denticulate; corolla wine-red, its tube 1.5--1.8 cm. long, greatly arched, densely puberulent on the outside, the lobes about 3 mm. long; stamens exserted about 5 mm. from the corolla-tube; fruiting-calyx patelliform, about 2 mm. long and 6 mm. wide, more or less pulverulent and resinous-punctate, the rim truncate, very minutely apiculate.

The type of this very distinct species was collected by Henri Humbert and Charles Fletcher Swingle (no. 5639) in the lower valley of the Mandrare, east of Ambovombe, Madagascar, in September, 1928, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. A sheet of loose leaves, Perrier de la Bâthie 10276 bis, is referred here tentatively. The leaves are firmly chartaceous and shiny, to 8 cm. long and 4 cm. wide, acuminate-cuneate at the base, glabrous on both surfaces, and with the secondaries and veinlet reticulation conspicuous and subprominulous on both surfaces.

VITEX MADAGASCARIENSIS Moldenke, sp. nov.

Frutex; ramis paucis crassis obtuse tetragonis profunde canaliculatis dense glanduloso-pubescentibus, pilis brevibus fulvo-brunneis; foliis 9-foliolatis; petiolis densissime glanduloso-pubescentibus et non-glanduloso-pilosis; foliolis sessilibus chartaceis vel submembranaceis longissimis oblanceolatis supra plusminusve parce pilosis, subtus in venis majoribus densiore pilosis densissime impresso-punctatis, laminis longe acuminatis integris, ad basim longe attenuatis; inflorescentiis axillaribus sphaeroideis sessilibus dense congestis multifloris.

Shrub, 2-4 m. tall; branches few, with the leaves clustered at their summit, stout, obtusely tetragonal, deeply canaliculate, densely glandular-pubescent on the younger parts with short-fulvous-brown hair interspersed with much longer non-glandular hairs that rub off in age; leaves decussate-opposite, 9-foliolate; petioles stout and stiff, conspicuously angular, 24-25 cm. long, very densely glandular-pubescent with spreading fulvous-brown short hair, interspersed with much longer non-glandular hairs; leaflets sessile, chartaceous or submembranous, rather dark-green on both surfaces or somewhat lighter above in drying, very long and narrow, mostly 6 times as long as wide, oblanceolate, more or less lightly pilose above, much more densely so on the larger venation, very densely impressed-punctate and pilosulous-puberulent or short-pubescent beneath, with scattered much longer hairs interspersed, more densely pubescent on the venation, the central ones 27-30 cm. long and 3.6-5.1 cm. wide, long-acuminate at the apex, entire, long-attenuate to the base, the lower ones 8-11 cm. long and 1.5-2.8 cm. wide, asymmetrical; inflorescence apparently axillary, spherical, sessile, densely congested, many-flowered, very densely fulvous-villous or -hirsute throughout; peduncles obsolete; cyme-branches and pedicels much abbreviated, mostly completely hidden by the flowers; bractlets linear, about 5 mm. long, densely fulvous-hirsute; calyx yellow when fresh, campanulate, about 6 mm. long and wide, densely fulvous-villous or -hirsute, its rim truncate and subentire; corolla infundibular-tubular, 2-2.5 cm. long, somewhat incurved, very densely fulvous-villous or -hirsute outside, yellow when fresh, the

tube about 8 mm. wide at the apex, gradually narrowed to the base, the lobes 5, unequal, 4--5 mm. long, acute or subacute at the apex, densely fulvous-villous outside, with only a few scattered hairs on the inner surface, reflexed at anthesis; stamens exerted about 1 cm. from the corolla-tube, the exerted portion very sparsely scattered-pilosulous; anthers deeply bilobed, slightly over 1 mm. long, the thecae often somewhat twisted at the base; pistil slightly shorter than the stamens, glabrous, bifid at the apex.

The type of this very distinct species was collected by Henri Perrier de la Bâthie (no. 10269) in the eastern forest at Vatovavy, in the basin of the Manonjary, Madagascar, in October 1911, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The collector makes the curious statement that "infl. en grosse sphère de 0,20 a 0,40 cm. de diam.", but the inflorescence on the type specimen is 6 cm. in diameter. He also says "poils d'un rouge orange" and "calice et corolle jaunes".

VITEX MICROPHYLLA Moldenke, sp. nov.

Frutex ramosus; ramis ramulisque gracillimis griseis acute vel obtuse tetragonis plusminusve cinereo-puberulis deinde glabrescentibus; sarmentis numerosis brevibus gracillimis densissime cinereo- vel sordido-pubescentibus; foliis 3-foliolatis; petiolis filiformibus densissime cinereo- vel sordido-pubescentibus; laminis chartaceis vel membranaceis late ellipticis vel obovatis vel subrotundatis, supra subadpresso-puberulis, subtus densissime tomentello-pubescentibus, non punctatis integris; inflorescentiis paniculatis paucifloris.

Shrub about 2 m. tall; branches and branchlets numerous, very slender, grayish, acutely or obtusely tetragonal, more or less cinereous-puberulent, glabrescent in age, the angles sometimes slightly margined; twigs numerous, short, very slender, very densely cinereous- or sordid-pubescent with short rather spreading hairs; nodes not annulate; principal internodes 0.3--3.5 cm. long, mostly much abbreviated; leaf-scars conspicuously elevated, corky; leaves decussate-opposite, 3-foliolate, numerous; petioles filiform, 4--21 mm. long, very densely cinereous- or sordid-pubescent; petiolules filiform, 1--6 mm. long, densely cinereous-pubescent, or obsolete on lateral leaflets; leaflets thin-chartaceous or membranous, rather uniformly bright-green on both surfaces or somewhat lighter beneath, varying from broadly elliptic or obovate to subrotund, often somewhat asymmetric, subappressed-puberulent above, very densely tomentellous-pubescent beneath, not punctate, the central one 4--21 mm. long, 4--14 mm. wide, varying from acute to obtuse or rounded at the apex, entire, varying from subcuneate-acute to rounded at the base; midrib filiform, flat above, very slightly subprominulous beneath; secondaries filiform, 3--5 per side,

flat or obscure above, mostly obscured by the pubescence beneath, ascending, hardly arcuate; veinlet reticulation rather abundant, mostly indiscernible above, mostly obscure beneath; inflorescence terminating the very short axillary twigs, in very small panicles 1--3 cm. long and 1--2 cm. wide, few-flowered, equaling or shorter than the subtending leaves; peduncles filiform, 1--5 mm. long, densely short-pubescent with cinereous or sordid hairs, sometimes with a pair of very small 3-foliolate leaf-like bracts at the apex; pedicels and inflorescence-branches filiform, densely sordid-pubescent, the former 0.5--1.5 mm. long, the latter to 4 mm. long; bractlets linear, to 2 mm. long, densely cinereous-pubescent; calyx campanulate, herbaceous, about 2 mm. long and wide, densely short-pubescent or puberulent and resinous-punctate, its rim shortly 5-dentate; corolla yellowish (or the lobes brownish and the tube greenish-white), 2-lipped, puberulent and resinous-punctate on the outside, the tube about 3 mm. long, the lower lip about 2 mm. long, wide-spreading, the upper lobes about 1 mm. long, rounded at the apex; stamens and pistil equaling the corolla-tube; fruiting-calyx incrassate, cupuliform, about 3.5 mm. long and wide, puberulent and somewhat resinous-punctate, the rim conspicuously triangular-dentate, the teeth attenuate-acute at the apex; fruit drupaceous, elliptic, about 8 mm. long and 5 mm. wide, glabrous, shiny, much wrinkled in drying.

The type of this very distinct species was collected by André Seyrig (no. 250) at various places among gneiss rocks, altitude 750--1000 m., in the neighborhood of Ampandravana, between Bekily and Tsivory, Madagascar, in October, 1942, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX OSCITANS Moldenke, sp. nov.

Frutex vel arbor; ramulis crassiusculis griseis dense puberulis; foliis 1-foliolatis; petiolis crassis minutissime puberulis vel glabrescentibus; laminis coriaceis late ellipticis vel obovatis, ad apicem subtruncatis vel roundatis, integris sub-revolutis, ad basim cuneato-acutis vel breviter acuminatis, utrinque glabris, subtus obscure impresso-punctatis; inflorescentiis axillaribus cymosis paucifloris dense adpresso-puberulis.

Shrub or tree; branchlets stoutish, grayish, densely puberulent on the younger parts; principal internodes apparently rather short, 1.5--2 cm. long; leaves decussate-opposite, 1-foliolate; petioles stout, 1.6--2 cm. long, very minutely puberulous or glabrescent, swollen at the apex; blades coriaceous, rather uniformly bright-green on both surfaces, very shiny beneath, broadly elliptic or obovate, 11--14 cm. long, 6--8 cm. wide, varying from subtruncate or rounded at the apex to very short-apiculate, entire, usually somewhat revolute at the margins in drying, cuneate-acute or short-acuminate at the base,

glabrous (or practically so) on both surfaces, obscurely impressed-punctate beneath; midrib coarse, flat above, very prominent toward the base beneath, rapidly diminishing in size as the apex is approached beneath; secondaries very slender, 7--9 per side, flat and mostly obscure above, prominulous beneath, divaricate-ascending, often furcate and irregularly anastomosing in many loops near the margins beneath; veinlet reticulation indiscernible above, only the larger parts prominulous beneath; inflorescence axillary, cymose, few-flowered, about equalling the subtending petioles; peduncles flattened, about 5 mm. long, densely appressed-pubescent with cinereous short hairs; cyme-branches and pedicels slender, 2--4 mm. long, densely appressed-puberulent with antrorse whitish hairs; bractlets rather large and conspicuous, spatulate, about 5 mm. long, stipitate, about 3 mm. wide at the apex, glabrous and brunnescent on one surface, the other surface densely appressed-puberulent with antrorse cinereous hairs; calyx campanulate, 5--6 mm. long and wide, very densely short-pubescent with appressed cinereous hairs outside, glabrous within, its rim often flaring, 5-toothed, the teeth broadly triangular-ovate, 1.5--2 mm. long, attenuate-acute or cucullate-apiculate at the apex; corolla infundibular, short and broad, densely villous-hirsute outside, more densely so toward the apex, with long sordid-brownish hairs, the tube 1--1.3 cm. long, 7--8 mm. wide at the apex, the limb rather deeply lobed, the upper lobe firm or arched, the others patent-reflexed, 4--5 mm. long; stamens and pistil surpassing the corolla-mouth by about 1 cm.; filaments pilosulous on the exerted portion; anthers about 1.5 mm. long, the 2 thecae often twisted; style glabrous, bifid at the apex.

The type of this species was collected by M. Louvel (no. 81) at Tampina, Madagascar, in July, 1925, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX PERVILLEI var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit sarmentis petiolisque petiolulisque laminisque pedunculisque ramisque cymorum pedicellisique bracteolisique calycibusque dense puberulis et laminis subtus dense resinoso-punctatis.

This variety differs from the typical form of the species in having its young twigs, petioles, petiolules, both leaflet-surfaces, peduncles, cyme-branches, pedicels, bractlets, and calyxes densely puberulent, and the lower leaflet-surfaces densely resinous-punctate.

The type of the variety was collected by Henri Humbert (no. 3019) among siliceous rocks on rocky slopes, altitude 800--1000 m., in the valley of Ithosy, basin of the Mangoky, Madagascar, on October 29 or 30, 1924, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The name of this grand collector will always be indelibly associated with

the amazing flora of Madagascar, a botanist's paradise!

VITEX PULCHRA Moldenke, sp. nov.

Frutex; ramulis crassis medullosis dense flavescenti-villosis, pilis antrorsis; foliis 6-foliolatis; petiolis dense ferrugineo-villosulis, pilis brevibus subadpressis antrorsis; petiolulis dense ferrugineo-villosulis; laminis coriaceis supra plusminusve dense piloso-pubescentibus deinde minute scabridis, subtus densissime ferrugineo-pubescentibus, anguste ellipticis vel oblanceolatis acutis vel breviter acuminatis integris sed plerumque valde undulato-crispis; inflorescentiis axillaribus sessilibus densissime multifloris congestis.

Shrub; branchlets stout, medullose, densely flavescent-villous with atrorse hairs; principal internodes apparently abbreviated; leaves decussate-opposite, 6-foliolate; petioles stout, 7-13 cm. long, densely ferruginous-villosulous with subappressed antrorse hairs much shorter than those on the branchlets; petiolules rather stoutish, 0.5-2 cm. long, irregular in length, very densely ferruginous-villosulous with short antrorse hairs; leaflet-blades coriaceous, grayish-green above, ferruginous beneath, minutely scabridous above when mature, more or less densely pilose-pubescent when young, very densely ferruginous-pubescent beneath, narrow-elliptic or oblanceolate, the central ones 8.5-15 cm. long and 2.5-4 cm. wide, the lower ones smaller, acute or very shortly acuminate at the apex, entire but usually conspicuously undulate-crisped along the margins, varying from acute to obtuse or rounded at the base, sometimes asymmetric; midrib rather coarse, impressed and usually ferruginous-pubescent above, very conspicuously rounded prominent beneath; secondaries slender, 8-12 per side, more or less impressed above (at least on larger leaves), sharply prominent beneath, divaricate-ascending, irregularly arcuate-joined in many small loops near the margins beneath; veinlet reticulation abundant, varying from subprominulous above on smaller leaves to impressed on larger ones, sharply prominulous beneath; inflorescence axillary, sessile, very densely many-flowered and congested; peduncles obsolete; pedicels much abbreviated or obsolete, very densely flavescent-villous; bractlets elongate, linear, to 1 cm. long, glabrous and nigrescent on one surface, very densely flavescent-villous on the other surface; calyx campanulate, 7-8 mm. long, about 5 mm. wide at the apex, very densely fulvous-villous on the outside with long antrorsely subappressed hairs, the rim shortly 5-dentate, the teeth about 1 mm. long; corolla dark-red, tubular, about 2.5 cm. long, incurved, very densely long-villous on the outside with subappressed, long, sordid-silvery hairs, the lobes about 2 mm. long; stamens and pistil exerted about 1 cm. from the corolla-mouth.

The type of this handsome species was collected by Henri

Perrier de la Bâthie (no. 10238) in the forest on hills at an altitude of 800 m., Anoloïnoy, Madagascar, in January, 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX RESINIFERA Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus obtuse tetragonis dense puberulis deinde glabrescentibus; foliis 1-foliolatis; petioliis gracillimis minute adpresso-puberulis; laminis chartaceis anguste ellipticis acutis vel breviter acuminatis integris, ad basim plerumque obtusis vel rotundatis, utrinque dense resinoso-punctulatis, subtus plusminusve minutissime puberulis; inflorescentiis axillaribus 1-3-floris perspicue bracteolatis.

Shrub, 1-2 m. tall; branches and branchlets slender, grayish-brown, obtusely tetragonal, densely puberulent on the younger parts, glabrescent in age, lenticellate; nodes not annulate; principal internodes 0.6-3 cm. long, mostly abbreviated; leaf-scars minute; leaves decussate-opposite, 1-foliolate; petioles very slender, 6-14 mm. long, flattened above, minutely appressed-puberulous, brunnescent in drying; blades chartaceous, brunnescent in drying, dark and shiny above, lighter beneath, narrowly elliptic, 2.5-6.5 cm. long, 8-22 mm. wide, acute or short-acuminate at the apex, entire, mostly obtuse or rounded (rarely acute) at the base, densely resinous-punctulate on both surfaces, more or less obscurely and very minutely puberulous beneath; midrib slender, impressed above, prominent beneath; secondaries filiform, about 6 per side, arcuate-ascending, flat or very slightly subprominulous above, prominulous beneath; veinlet reticulation very abundant and fine, often subprominulous above, flat beneath or the larger portions subprominulous; inflorescence axillary, usually shorter or subequaling the subtending leaves, 1-3-flowered, conspicuously bracteolate; peduncles slender, 1.3-3 cm. long, appressed-puberulous, flattened, terminated by a pair of conspicuous bractlets which are narrowly oblong, about 5 mm. long and 1 mm. wide, minutely puberulous; pedicels filiform, 5-7 mm. long on the central flower, 1-3 mm. long on the lateral ones which are borne on filiform cyme-branches about 10 mm. long, minutely appressed-puberulous; calyx membranous, campanulate, deeply lobed to near the base, minutely appressed-puberulous, the tube about 2 mm. long and wide, the 5 equal lobes oblong-lanceolate, 4-5 mm. long and 1-1.5 mm. wide, acute at the apex; corolla-tube green, about 6 mm. long, broadly cylindric, ampliate at the apex, not arched, minutely appressed-puberulent on the outside, the limb labiate, the upper lip hooded, 2-lobed, green, the lower lip 3-lobed, white, the central lobe rounded; fruiting-calyx unchanged except that the united portion is much broader; fruit drupaceous, globose, nigrescent in drying, about 4 mm. long and wide.

The type of this species was collected by Henri Perrier de la Bâthie (no. 1727) in granitic soil in woods on Mount Ambokibenga, Milanĵa, Madagascar, in May, 1904, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

VITEX RUBRA Moldenke, sp. nov.

Frutex vel arbor parva; ramis ramulisque griseis adpresso-puberulis deinde glabrescentibus; foliis 1-foliolatis; petiolis crassiusculis minute puberulis; laminis coriaceis ellipticis rotundatis vel emarginatis integris revolutis, ad basim acutis vel breviter acuminatis, utrinque glabris et dense impresso-punctatis; inflorescentiis axillaribus 1-paucifloris.

Shrub or small tree; branches and branchlets medium-slender, gray, often lichen-encrusted, obtusely tetragonal, appressed-puberulent, glabrescent in age; nodes not annulate; principal internodes mostly much abbreviated and about 5 mm. long, elongated to 4 cm. on larger branchlets; leaves decussate-opposite, 1-foliolate; petioles rather stoutish, 2--15 mm. long, flat and canaliculate above, minutely puberulent; blades coriaceous, gray-green on both surfaces and rather shiny, elliptic, 2.5--6.5 cm. long, 1.2--4.2 cm. wide, rounded or emarginate at the apex, entire and plainly revolute along the margins, acute or short-acuminate at the base, glabrous and densely impressed-punctate on both surfaces; midrib slender, flat above, prominent beneath; secondaries very slender, 5 or 6 per side, arcuate-ascending, flat and rather obscure above, prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence axillary, 1-few-flowered, shorter than the subtending leaves; peduncles very slender or subfiliform, obsolete or to 5 mm. long, puberulent; pedicels filiform, about 2 mm. long, whitish-puberulent; bractlets linear-oblong, about 2 mm. long and 1 mm. wide, conduplicate, whitish-puberulent; calyx campanulate, 2--3 mm. long, 1.5--2 mm. wide, grayish-puberulent, its rim plainly 5-toothed, the teeth ovate, about 1 mm. long; corolla dark-red, its tube cylindric, arched, 1.5--1.8 cm. long, densely pubescent on the outside, the lobes about 2 mm. long, erect; stamens and pistil exerted 8--9 mm. from the corolla-tube; fruiting-calyx somewhat incrassate, campanulate, about 5 mm. long and 7 mm. wide, puberulent, the rim deeply 5-toothed, the teeth ovate, 2--2.5 mm. long, acute at the apex; fruit drupaceous, elliptic, about 7 mm. long and 5 mm. wide, glabrous, wrinkled in drying.

The type of this species was collected by Henri Perrier de la Bâthie (no. 13709) at an altitude of 1500 m. on the Massif d'Andringitra, Madagascar, on April 19, 1911, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. Some of the species of this and other genera of this family in Madagascar appear to be worthy of cultivation.

VITEX STELLATA Moldenke, sp. nov.

Arbor parva; ramulis crassis medullosis obtuse-tetragonis canaliculatis glauco-griseis dense tomentellis, pilis ad apicem glauco-stellatis; foliis 5-foliolatis; petiolis crassis dense tomentellis, pilis perspicue ad apicem glauco-stellatis; petiolulis crassis dense glauco-tomentellis; laminis subcoriaceis obovatis utrinque densissime pubescentibus rotundatis integris subrevolutis, ad basim longe attenuatis.

Small tree; branchlets stout, medullose, obtusely tetragonal, canaliculate, glaucous-gray, densely tomentellous with glaucous-stellate tips on the hairs; nodes not annulate; principal internodes 1.5-4 cm. long or longer; leaf-scars large but not especially prominent; terminal buds very densely flavo-erubrescent-tomentellous; leaves decussate-opposite, 5-foliolate; petioles stout, 12-13 cm. long, densely tomentellous with the hairs conspicuously glaucous-stellate at their tips giving the petioles a decided bluish cast; petiolules stout, 2-14 mm. long, the central ones longest, all densely tomentellous with glaucous-stellate hairs, canaliculate above; leaflet-blades subcoriaceous, bright-green above, cinereous beneath, obovate, very densely pubescent on both surfaces, the pubescence cinereous beneath, the central ones 16-18 cm. long and 7.5-8 cm. wide, the lateral and lower ones smaller, rounded at the apex, entire and somewhat revolute along the margins, long-attenuate at the base; midrib stout, flat above, rounded-prominent beneath; secondaries slender, regular, 15-17 per side, ascending, slightly arcuate toward the margins, not anastomosing, flat above, sharply prominent beneath; veinlet reticulation abundant, mostly rather obscure above, prominent beneath; inflorescence not seen.

The type of this species was collected by Raymond Decary (no. 14549) at Massif de l'Ankara, Madagascar, on July 25, 1939, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. Lacking inflorescences for examination, it is possible that this species may not be correctly placed here, in spite of the collector's determination. Its pubescence suggests the Bignoniaceae.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND
ERIOCAULACEAE. SUPPLEMENT 5

Harold N. Moldenke

Since the publication of the previous supplement to this list by me on December 18, 1950, over 5400 additional specimens

of these groups have been examined and annotated from the Joseph Ewan herbarium at New Orleans, the Meisner, Britton, and Torrey herbaria at the New York Botanical Garden, the Government Herbarium at Salisbury (Southern Rhodesia), and the herbaria of the Botanical Garden at Buitenzorg, the Muséum National d'Histoire Naturelle at Paris, the Royal Botanic Gardens at Kew, the Naturhistoriska Riksmuseet at Stockholm, the Bureau of Plant Industration Station at Beltsville (Maryland), the Naturhistorisches Museum at Vienna, the Instituto Botanico at São Paulo, the Jardin Botanique de l'Etat at Brussels, North Carolina State College at Raleigh, Tulane University at New Orleans, the Colegio de la Salle at Vedado (Havana, Cuba), the Museo Paranaense at Curitiba (Brazil), the Colegio Anchieta at Porto Alegre (Brazil), and the Institut Français d'Afrique Noire at Dakar (Senegal). These specimens have brought to light 72 new county or parish records, 229 new state, province, or department records, and 432 new country or island records not previously reported. Full citation of all substantiating specimens will be published in my forthcoming generic monographs or their supplements.

UNITED STATES OF AMERICA:

New York:

Verbena bracteata Lag. & Rodr. [Chemung County]

Verbena urticifolia L. [Rensselaer County]

Maryland:

Eriocaulon compressum Lam. -- delete Baltimore County

Eriocaulon decangulare L. [Baltimore County]

Verbena urticifolia L. [Montgomery County]

North Carolina:

Callicarpa americana L. [Anson County]

Callicarpa dichotoma (Lour.) K. Koch [Martin County]

Eriocaulon compressum Lam. [Wake County]

Eriocaulon septangulare With. [Bladen County]

Lachnocaulon anceps (Walt.) Morong [Cumberland & Pamlico Counties]

Lachnocaulon beyrichianum Sporleder [Bladen, New Hanover, & Pender Counties]

Lachnocaulon minus (Chapm.) Small [Cumberland County]

Phyla lanceolata (Michx.) Greene [Hyde County]

Phyla nodiflora (L.) Greene [Hyde & Pender Counties]

Stylodon carneus (Medic.) Moldenke [Bladen, Sampson, & Wayne Counties]

Syngonanthus flavidulus (Michx.) Ruhl. [Brunswick County]

Verbena bonariensis L. [Bladen & New Hanover Counties]

Verbena bracteata Lag. & Rodr. [Forsyth County]

Verbena brasiliensis Vell. [Northampton County]

Verbena scabra Vahl [Brunswick County]
Verbena simplex Lehm. [Granville County]
Verbena urticifolia L. [Granville & Wake Counties]
Verbena urticifolia var. leiocarpa Perry & Fernald [Wake County]

South Carolina:

Verbena tenuisecta Briq. [Dillon County]

Georgia:

Callicarpa americana L. [Rockdale & Wayne Counties]

Verbena rigida Spreng. [Lincoln County]

Florida:

Clerodendrum indicum (L.) Kuntze [Polk County]

Eriocaulon compressum Lam. [Highlands County]

Stachytarpheta urticaefolia (Salisb.) Sims [Highlands County]

Syngonanthus flavidulus (Michx.) Ruhl. [Bay & Palm Beach Counties]

Ohio:

Verbena hastata L. [Medina County]

Tennessee:

Callicarpa americana L. [Lauderdale County]

Missouri:

Verbena simplex Lehm. [Dent County]

Louisiana:

Avicennia nitida Jacq. [Plaquemines Parish]

Callicarpa americana L. [Grant & Washington Parishes]

Callicarpa americana var. lactea F. J. Muller [Lincoln Parish]

Clerodendrum bungei Steud. [Orleans Parish]

Lantana horrida H.B.K. [Orleans Parish]

Phyla nodiflora (L.) Greene [Plaquemines & Saint Tammany Parishes]

Verbena bipinnatifida Nutt. [Caddo Parish]

Verbena bonariensis L. [Plaquemines & Saint Martin Parishes]

Verbena bracteata Lag. & Rodr. [Orleans Parish]

Verbena brasiliensis Vell. [Saint Charles, Saint Martin, & Saint Tammany Parishes]

Verbena canadensis (L.) Britton [Union Parish]

Verbena hastata L. [Orleans Parish]

Verbena rigida Spreng. [Ascension Parish]

Verbena tenuisecta Briq. [Orleans Parish]

Verbena urticifolia L. [Lincoln & Orleans Parishes]

Verbena xutha Lehm. [Avoyelles & Saint Charles Parishes]

Vitex agnus-castus L. [Saint Bernard Parish]

Colorado:

Verbena bracteata Lag. & Rodr. [Riverside County]

Verbena stricta Vent. [Baca & Boulder Counties]

Texas:

- Callicarpa americana L. [Hill County]
Tetraclea coulteri A. Gray [Culberson County]
Verbena bonariensis L. [Orange County]
Verbena rigida Spreng. [Waller County]
Verbena tenuisecta Briq. [Hardin & Waller Counties]
Verbena xutha Lehm. [Anderson County]

California:

- Verbena lasiostachys Link [Contra Costa County]

MEXICO:

- Callicarpa pringlei Briq. [Hidalgo]
Phyla scaberrima (A. L. Juss.) Moldenke [Hidalgo]
Stachytarpheta acuminata P. DC. [Hidalgo]
Stachytarpheta hintoni Moldenke [Sonora]
Verbena pinetorum Moldenke [Sonora]
Verbena trifida H.B.K. [Hidalgo]

COSTA RICA:

- Aegiphila falcata Donn. Sm. [Limón]
Aegiphila panamensis Moldenke [Puntarenas]
Eriocaulon microcephalum H.B.K. [Cartago]
Lippia cardiostegia Benth. [Puntarenas]
Phyla nodiflora (L.) Greene [Puntarenas]
Stachytarpheta mutabilis var. violacea Moldenke [Alajuela]
Tonina fluviatilis Aubl. [Puntarenas]
Vitex cooperi Standl. [Puntarenas]

PEARL ISLANDS:

- Callicarpa acuminata H.B.K. [San José]
Citharexylum caudatum L. [San José]
Cornutia grandifolia var. normalis (Kuntze) Moldenke [San José]

CUBA:

- Stachytarpheta cayennensis (L. C. Rich.) Vahl [Las Villas]

JAMAICA:

- Verbena hastata L.

BEATA:

- Avicennia nitida Jacq.
Citharexylum fruticosum L.
Lantana reticulata Pers.
Stachytarpheta jamaicensis (L.) Vahl

ALTA VELA:

- Duranta repens L.
Stachytarpheta jamaicensis (L.) Vahl

ST. LUCIA:

- Citharexylum fruticosum L.
Lantana arubensis Moldenke
Lantana camara L.

Lantana radula Sw.

Phyla strigulosa var. parvifolia (Moldenke) Moldenke

Stachytarpheta australis Moldenke

CANNUOAN ISLAND:

Lantana reticulata Pers.

BEQUIA:

Lantana reticulata Pers.

WHITE ISLAND:

Lantana involucrata L.

CARRIACOU:

Lantana involucrata L.

PETTIT MARTINIQUE:

Lantana reticulata Pers.

COLOMBIA:

Aegiphila filipes Mart. & Schau. [Amazonas]

Lantana maxima Hayek [Tolima]

Lantana trifolia f. hirsuta Moldenke [Huila]

Lippia alba (Mill.) N. E. Br. [Amazonas]

Petrea atrocoerulea Moldenke [Amazonas]

Phyla betulaefolia (H.B.K.) Greene [Amazonas]

Phyla nodiflora (L.) Greene [Nariffo]

Phyla scaberrima (A. L. Juss.) Moldenke [Nariffo]

Stachytarpheta cayennensis (L. C. Rich.) Vahl [Nariffo]

Tonina fluviatilis Aubl. [Nariffo]

VENEZUELA:

Leiostrix flavescens (Bong.) Ruhl. [Trujillo]

Lippia alba (Mill.) N. E. Br. [Aragua]

Paepalanthus tortilis (Bong.) Mart. [Trujillo]

Paepalanthus williamsii Moldenke -- delete the asterisk

Phyla stoechadifolia (L.) Small [Aragua]

Syngonanthus eriophyllus var. glanduliferus Ruhl. -- to be deleted

Syngonanthus gracilis var. koernickeanus Ruhl. [Bolivar]

SURINAM:

Syngonanthus eriophyllus (Mart.) Ruhl. -- to be deleted

Syngonanthus eriophyllus var. glanduliferus Ruhl. -- to be deleted

Syngonanthus gracilis var. koernickeanus Ruhl.

ECUADOR:

Aloysia scorodonioides var. detonsa (Briq.) Moldenke [Tunguragua]

GALAPAGOS ISLANDS:

Avicennia nitida Jacq. [Santa Cruz]

PERU:

Aloysia scorodonioides (H.B.K.) Cham. [Amazonas, Apurimac, & Puno]

- Aloysia virgata (Ruiz & Pav.) A. L. Juss. [Cuzco]
Stachytarpheta cayennensis (L. C. Rich.) Vahl [San Martín]
Verbena alpigena Walp. -- to be deleted
Verbena laciniata (L.) Briq. [Junín]
Verbena multifida Ruiz & Pav. -- to be deleted

BRAZIL:

- Aloysia pulchra (Briq.) Moldenke -- delete Rio de Janeiro
Aloysia virgata (Ruiz & Pav.) A. L. Juss. [Goyaz]
Eriocaulon sellowianum var. longifolium Moldenke [Goyaz]*
Lantana aristata (Schau.) Briq. [São Paulo]
Lantana camara var. nivea (Vent.) L. H. Bailey [Federal District]
Lantana punctulata Moldenke [Pará]*
Leiothrix aquatica Alv. Silv. -- to be deleted
Leiothrix hirsuta var. blanchetiana (Körn.) Ruhl. [Rio de Janeiro]
Lippia alba (Mill.) N. E. Br. [Goyaz]
Paepalanthus batocephalus Ruhl. [Rio de Janeiro]
Paepalanthus claussenianus Körn. [Goyaz]
Paepalanthus diplobetor Ruhl. is the correct orthography
Paepalanthus elongatus var. helichrysoides (Kunth) Ruhl. [São Paulo]
Paepalanthus hilairei var. maximiliani Ruhl. [Goyaz]
Paepalanthus ramosus var. affinis (Bong.) Ruhl. [Rio de Janeiro]
Paepalanthus speciosus (Bong.) Körn. [Paraná]
Paepalanthus speciosus var. glaber Ruhl. [Maranhão]
Paepalanthus tortilis (Bong.) Mart. [Federal District]
Paepalanthus williamsii Moldenke [Amazonas]
Phyla nodiflora (L.) Greene [Rio Grande do Sul]
Syngonanthus gracilis var. olivaceus Ruhl. [Goyaz]
Syngonanthus gracilis var. setaceus Ruhl. [Minas Geraes]
Syngonanthus nitens (Bong.) Ruhl. [São Paulo]
Syngonanthus nitens var. erectus Ruhl. [Mattogrosso]
Syngonanthus niveus var. rosulatus (Körn.) Moldenke [Minas Geraes & Rio de Janeiro]*
Syngonanthus tenuis (H.B.K.) Ruhl. [Amazonas]
Syngonanthus vernonioides var. minor Kunth [Minas Geraes]*
Syngonanthus weddellii Moldenke [Goyaz]*
Tonina fluviatilis Aubl. [Mattogrosso]
Verbena alata f. alba Moldenke [Minas Geraes]*
Verbena calliantha Briq. [Rio Grande do Sul]
Verbena ephedroides Cham. [Santa Catharina]
Verbena hirta var. gracilis Dusén [Rio de Janeiro]
Verbena inamoena Briq. -- to be deleted

- Verbena jordanensis Moldenke [Santa Catharina]
Verbena lobata var. glabrata Moldenke [Rio de Janeiro]
Verbena malmii Moldenke [Paraná]
Verbena nervosa Scheele -- to be deleted
Verbena paulensis Moldenke [São Paulo]*
Verbena ramboi Moldenke [Rio Grande do Sul]*
Verbena rigida var. reineckii (Briq.) Moldenke [Rio Grande do Sul]
Verbena sagittalis Cham. [Rio Grande do Sul]
Verbena stenophylla Scheele -- to be deleted
Verbena tenera Spreng. [Santa Catharina]

BOLIVIA:

- Duranta recurvistachys Rusby [La Paz]
Timotocia mansoi (Schau.) Moldenke [El Beni]
Verbena gynobasis Wedd.

PARAGUAY:

- Verbena inamoena Briq. -- to be deleted
Verbena rigida var. reineckii (Briq.) Moldenke -- delete the asterisk

URUGUAY:

- Eriocaulon leptophyllum Kunth

CHILE:

- Lippia geisseana (R. A. Phil.) Solered. [Coquimbo]
Verbena multifida Ruiz & Pav. -- to be deleted

ARGENTINA:

- Citharexylum mendocinum R. A. Phil. -- to be deleted
Junellia juniperina (Lag.) Moldenke [Santiago del Estero]
Verbena hookeriana (Covas & Schnack) Moldenke [Santiago del Estero]
Verbena rigida Spreng. [Córdoba]
Verbena santiaguensis (Covas & Schnack) Moldenke [Corrientes]

PORTUGAL:

- Vitex agnus-castus L.

ITALY:

- Vitex negundo var. intermedia (P'ei) Moldenke

TRIESTE:

- Vitex agnus-castus f. latifolia (Mill.) Rehd.

FIUME:

- Vitex agnus-castus f. latifolia (Mill.) Rehd.

UNION OF SOCIALIST SOVIET REPUBLICS:

- Vitex agnus-castus var. pseudo-negundo (Hausskn.) Borrm.
 [Turkmanskaya]

- Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.
 [Maritime Territory]

ALGERIA:

- Vitex agnus-castus L.
Vitex agnus-castus f. latifolia (Mill.) Rehd.

FRENCH WEST AFRICA:

Clerodendrum capitatum var. conglobatum (J. G. Baker) Thomas
[French Soudan]

ANGLO-EGYPTIAN SUDAN:

Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum triplinerve Rolfe

ABYSSINIA:

Premna somaliensis J. G. Baker

SENEGAL:

Eriocaulon inundatum Moldenke*
Vitex chrysocarpa Planch.

SIERRA LEONE:

Clerodendrum capitatum var. cephalanthum (Oliv.) J. G. Baker
Vitex thrysiflora J. G. Baker

GOLD COAST:

Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum triplinerve Rolfe

NORTHERN NIGERIA:

Lippia africana var. sessilis Moldenke -- to be deleted
Lippia nigeriensis var. brevipedunculata Moldenke -- delete
the asterisk
Lippia wilmsii var. sessilis (Moldenke) Moldenke*

SOUTHERN NIGERIA:

Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum triplinerve Rolfe

CAMEROONS:

Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum formicarum var. sulcatum Thomas -- to be deleted
Clerodendrum triplinerve var. sulcatum (Thomas) Moldenke

SPANISH GUINEA:

Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum triplinerve Rolfe

ST. THOMÉ:

Clerodendrum thomsonae Balf. f.

FRENCH EQUATORIAL AFRICA:

Clerodendrum schweinfurthii Gürke [Ubangi-chari]
Clerodendrum umbellatum var. asperifolium (Thomas) Moldenke

BELGIAN CONGO:

Clerodendrum buchholzii Gürke
Clerodendrum büttneri Gürke
Clerodendrum capitatum (Willd.) Schum. & Thonn.
Clerodendrum capitatum var. conglobatum (J. G. Baker) Thomas
Clerodendrum capitatum var. vanderysti Moldenke*
Clerodendrum cordifolium (Hochst.) A. Rich.
Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum formicarum var. sulcatum Thomas -- to be deleted
Clerodendrum johnstoni var. rubrum Thomas

Clerodendrum myricoides var. savanorum (De Wild.) Thomas --
to be deleted

Clerodendrum pusillum Gürke

Clerodendrum rotundifolium Oliv.

Clerodendrum silvaeanum Henriq.

Clerodendrum silvestre Thomas

Clerodendrum triplinerve Rolfe

Clerodendrum triplinerve var. sulcatum (Thomas) Moldenke

Clerodendrum ugandense Prain

Clerodendrum umbellatum var. asperifolium (Thomas) Moldenke

Lantana antidotalis Schum. & Thonn.

Lantana rhodesiensis Moldenke

Lantana tiliaefolia Cham.

Lantana viburnoides var. velutina Moldenke

Lippia callensi var. villosa Moldenke*

Lippia grandifolia var. angustispicata Moldenke*

Lippia grandifolia var. longipedunculata Moldenke

Lippia kituiensis Vatke

Lippia nigeriensis var. brevipedunculata Moldenke

Lippia plicata J. G. Baker

Lippia rehmanni H. H. W. Pearson

Lippia schliebeni Moldenke

Lippia wilmsii var. villosa (Moldenke) Moldenke

Premna angolensis Gürke

Premna bequaerti Moldenke*

Premna matadiensis Moldenke*

Verbena bonariensis L.

Vitex chrysocarpa Planch.

Vitex rivularis Gürke

UGANDA PROTECTORATE:

Clerodendrum buchholzii Gürke

Clerodendrum capitatum (Willd.) Schum. & Thonn.

Clerodendrum johnstoni Oliv.

Clerodendrum melanocrater Gürke

Lippia africana var. villosa Moldenke -- to be deleted

Lippia grandifolia var. longipedunculata Moldenke -- delete
the asterisk

Lippia wilmsii var. villosa (Moldenke) Moldenke

TANGANYIKA TERRITORY:

Clerodendrum formicarum var. sulcatum Thomas -- to be deleted

Clerodendrum triplinerve var. sulcatum (Thomas) Moldenke

Eriocaulon hanningtonii N. E. Br. -- delete the asterisk

Kalaharia spinescens var. hirsuta Moldenke

Lantana rhodesiensis Moldenke

Lippia africana Moldenke -- to be deleted

- Lippia africana var. villosa Moldenke -- to be deleted
Lippia wilmsii H. H. W. Pearson
Lippia wilmsii var. villosa (Moldenke) Moldenke
Premna longipes J. G. Baker
Vitex buchanani J. G. Baker
Vitex buchanani var. quadrangula (Gürke) Pieper -- delete the asterisk
Vitex grandifolia var. bipindensis (Gürke) Pieper
Vitex lokundjensis Pieper
Vitex mossambicensis Gürke

ZANZIBAR PROTECTORATE:

- Stachytarpheta urticaefolia (Salisb.) Sims

MOMBASA ISLAND:

- Premna hildebrandtii Gürke
Premna macrodonta J. G. Baker

KENYA:

- Clerodendrum capitatum var. cephalanthum (Oliv.) J. G. Baker
Clerodendrum johnstoni var. rubrum Thomas
Clerodendrum rotundifolium Oliv.
Lippia africana var. villosa Moldenke -- to be deleted
Lippia kituiensis Vatke -- delete the asterisk
Lippia wilmsii var. villosa (Moldenke) Moldenke
Premna hildebrandtii Gürke
Premna macrodonta J. G. Baker -- delete the asterisk

ANGOLA:

- Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum myricoides var. savanorum (DeWild.) Thomas -- to be deleted
Clerodendrum triplinerve Rolfe [Loanda]
Eriocaulon gilgianum Ruhl. -- delete the asterisk
Vitex mombassae Vatke [Loanda]

NORTHERN RHODESIA:

- Clerodendrum formicarum Gürke -- to be deleted
Clerodendrum toxicarium J. G. Baker
Clerodendrum triplinerve Rolfe
Kalaharia spinescens (Oliv.) Gürke
Lantana rhodesiensis Moldenke -- delete the asterisk
Lippia africana Moldenke -- to be deleted
Lippia africana var. villosa Moldenke -- to be deleted
Lippia wilmsii H. H. W. Pearson
Lippia wilmsii var. villosa (Moldenke) Moldenke
Vitex welwitschii Gürke

SOUTHERN RHODESIA:

- Chascanum pinnatifidum var. racemosum Schinz & Moldenke
Clerodendrum amplifolium S. Moore
Clerodendrum buchneri Gürke

Clerodendrum discolor var. kilimandscharense Thomas

Clerodendrum formicarum Gürke -- to be deleted

Clerodendrum holtzei F. Muell.

Clerodendrum lanceolatum Gürke

Clerodendrum myricoides var. camporum Gürke

Clerodendrum rehmanni Gürke

Clerodendrum triplinerve Rolfe

Clerodendrum ugandense Prain

Eriocaulon schweickerdti Moldenke*

Kalaharia spinescens var. hirsuta Moldenke

Lippia africana Moldenke -- to be deleted

Lippia wilmsii H. H. W. Pearson

Lippia wilmsii var. scaberrima (Moldenke) Moldenke

Lippia wilmsii var. villosa (Moldenke) Moldenke

Lippia woodii Moldenke

Phyla nodiflora var. rosea (D. Don) Moldenke

Verbena wrightii A. Gray

BRITISH NYASALAND PROTECTORATE:

Lippia africana var. scaberrima Moldenke -- to be deleted

Lippia wilmsii var. scaberrima (Moldenke) Moldenke

Premna longipes J. G. Baker -- delete the asterisk

Vitex buchanani var. quadrangula (Gürke) Pieper

PORTUGUESE EAST AFRICA:

Clerodendrum capitatum (Willd.) Schum. & Thonn.

Eriocaulon elegantulum Engl. [Quilimane]

Eriocaulon hanningtonii N. E. Br. [Quilimane]

Lantana camara var. aculeata (L.) Moldenke

Lippia wilmsii H. H. W. Pearson

Vitex mombassae Vatke [Mozambique]

Vitex welwitschii Gürke [Lourenço Marques]

SOUTHWEST AFRICA:

Lippia africana Moldenke -- to be deleted

BECHUANALAND PROTECTORATE:

Vitex payos var. glabrescens (Pieper) Moldenke

UNION OF SOUTH AFRICA:

Clerodendrum myricoides var. camporum Gürke [Natal]

Lippia africana Moldenke -- to be deleted

Lippia africana var. scaberrima Moldenke -- to be deleted

Lippia rehmanni H. H. W. Pearson -- delete the asterisk

Lippia wilmsii H. H. W. Pearson [Cape of Good Hope]

Lippia wilmsii var. scaberrima (Moldenke) Moldenke [Cape of Good Hope]

Stilbe charisepala Suesseng. [Cape of Good Hope]*

Verbena rigida Spreng. [Transvaal]

Vitex amboniensis Gürke [Transvaal]

COMORO ISLANDS:

Vitex trifolia var. bicolor (Willd.) Moldenke [Anjouan & Mayotte]

NOSY-BÉ:

Vitex trifolia var. bicolor (Willd.) Moldenke

MADAGASCAR:

Clerodendrum incisum var. parvifolium Moldenke*

Clerodendrum nudiflorum Moldenke*

Clerodendrum nudiflorum var. puberulentum Moldenke*

Clerodendrum sylvestre var. pubescens Moldenke*

Eriocaulon apiculatum H. Lecomte & Moldenke*

Eriocaulon flumineum Moldenke*

Eriocaulon gilgianum Ruhl.

Eriocaulon heterochiton var. acuminatum Moldenke*

Eriocaulon madagascariense Moldenke*

Eriocaulon mokalense Moldenke*

Eriocaulon mutatum N. E. Br.

Eriocaulon parvicapitulatum Moldenke*

Eriocaulon subulatum N. E. Br.

Eriocaulon trilobatum var. glabrescens Moldenke*

Paepalanthus lamarckii Kunth

Premna corymbosa var. madagascariensis Moldenke*

Priva humberti Moldenke*

Syngonanthus humberti Moldenke*

Vitex aurea Moldenke*

Vitex befotakensis Moldenke*

Vitex beraviensis var. acuminata Moldenke*

Vitex beraviensis f. pilosa Moldenke*

Vitex beraviensis f. villosa Moldenke*

Vitex bojeri var. suborbicularis Moldenke*

Vitex cauliflora Moldenke*

Vitex cauliflora var. longifolia Moldenke*

Vitex cauliflora var. villosissima Moldenke*

Vitex chrysomallum Steud. is the correct orthography

Vitex chrysomallum var. longicalyx Moldenke*

Vitex chrysomallum var. tomentella Moldenke*

Vitex coursi Moldenke*

Vitex doniana Sweet

Vitex elakelakensis Moldenke*

Vitex grandidiana var. angustifolia Moldenke*

Vitex humberti Moldenke*

Vitex humberti var. angustata Moldenke*

Vitex leandrii Moldenke*

Vitex lobata Moldenke*

Vitex madagascariensis Moldenke*

Vitex microphylla Moldenke*

Vitex oscitans Moldenke*

- Vitex pervillei var. pubescens Moldenke*
Vitex pinnata L.
Vitex pulchra Moldenke*
Vitex resinifera Moldenke*
Vitex rubra Moldenke*
Vitex stellata Moldenke*
Vitex trifolia var. bicolor (Willd.) Moldenke
- MASCARENE ISLANDS:
- Clerodendrum calamitosum L. [Mauritius]
Eriocaulon sexangulare L. [Mauritius]
Eriocaulon striatum Lam. [Mauritius]
- REUNION:
- Eriocaulon quinquangulare L.
- BALUCHISTAN:
- Vitex agnus-castus var. pseudo-negundo (Hausskn.) Bornm.
- NEPAL:
- Eriocaulon cinereum R. Br.
Premna tomentosa Willd.
- INDIA:
- Caryopteris paniculata C. B. Clarke [Sikkim]
Clerodendrum fragrans var. pleniflorum Schau. [Bastar]
Clerodendrum nutans Wall. [Khasi States]
Clerodendrum serratum (L.) Moon [Khasi States]
Clerodendrum viscosum Vent. [Khasi States]
Congea tomentosa var. azurea (Wall.) C. B. Clarke [West Bengal]
Eriocaulon cinereum R. Br. [Bihar & United Provinces]
Eriocaulon gracile Mart. [United Provinces]
Eriocaulon sexangulare L. [United Provinces]
Eriocaulon sollyanum Royle [Mysore]
Eriocaulon truncatum Hamilt. [Bihar & United Provinces]
Gmelina arborea var. canescens Haines [United Provinces]
Gmelina arborea var. glaucescens C. B. Clarke [Sikkim & United Provinces]
Gmelina asiatica var. villosa Bakh. -- to be deleted
Holmskioldia sanguinea Retz. [Khasi States]
Lippia alba (Mill.) N. E. Br. [Khasi States]
Petrea volubilis L. [Madras]
Sphenodesme griffithiana Wight [West Bengal]
Sphenodesme involucrata (Presl) B. L. Robinson [West Bengal]
Vitex altissima L. f. [United Provinces]
Vitex canescens Kurz [Manipur]
Vitex leucoxydon L. f. [Bastar & Madras]
Vitex negundo L. [Kashmir]
Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.
 [Madras & Mysore]

Vitex negundo var. intermedia (P'ei) Moldenke [Bangalore & East Punjab]

Vitex pinnata L. [Khasi States]

Vitex quinata (Lour.) F. N. Will. [Assam]

Vitex trifolia var. bicolor (Willd.) Moldenke [Bombay]

FRENCH INDIA:

Phyla nodiflora (L.) Greene

BURMA:

Eriocaulon cinereum R. Br. [Tenasserim]

Eriocaulon gracile Mart. [Upper Burma]

Gmelina arborea var. canescens Haines [Upper Burma]

Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.

Vitex coriacea C. B. Clarke -- to be deleted

Vitex peduncularis Wall. [Upper Burma]

ANDAMAN ISLANDS:

Sphenodesme involucrata (Presl) B. L. Robinson [South Andaman]

Vitex trifolia var. heterophylla (Mak.) Moldenke

CEYLON:

Eriocaulon brownianum var. latifolium Moldenke*

CHINA:

Callicarpa tsiangii Moldenke [Hupeh]

Clerodendrum lindleyi Decaisne [Yunnan]

Clerodendrum trichotomum var. ferrugineum Nakai [Chekiang]

Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.

[Shantung]

Vitex trifolia var. simplicifolia Cham. [Hopeh]

FORMOSA:

Clerodendrum trichotomum var. ferrugineum Nakai

JAPAN:

Clerodendrum trichotomum Thunb. [Kiushiu]

Clerodendrum trichotomum var. ferrugineum Nakai [Hokkaido & Kiushiu]

Eriocaulon kiusianum Maxim. [Kiushiu]*

Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.

[Kiushiu]

MACAO:

Caryopteris incana (Thunb.) Miq.

LANTAU ISLAND:

Vitex negundo L.

LAPPAS ISLAND:

Vitex trifolia var. simplicifolia Cham.

FRENCH INDO-CHINA:

Clerodendrum calamitosum L. [Cambodia]

Congea peteloti Moldenke [Laos & Tonkin]*

Teijsmanniodendron hollrungii (Warb.) Kosterm. [Annam & Cochinchina]

Vitex hollrungii Warb. -- to be deleted

Vitex peduncularis Wall. [Annam]

THAILAND:

Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.

Vitex coriacea C. B. Clarke -- to be deleted

Vitex negundo var. intermedia (P'ei) Moldenke

FEDERATED MALAY STATES:

Peronema canescens Jack [Johore, Kelantan, & Perak]

Sphenodesme barbata (Wall.) Schau. [Johore]

Sphenodesme triflora Wight [Johore, Perak, & Trengganu]

Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Kedah, Perak, & Selangor]

Teijsmanniodendron hollrungii (Warb.) Kosterm. [Johore, Pahang, & Perak]

Teijsmanniodendron holophyllum (J. G. Baker) Kosterm. [Johore]

Vitex coriacea C. B. Clarke -- to be deleted

STRAITS SETTLEMENTS:

Clerodendrum deflexum Wall. [Malacca]

Sphenodesme barbata (Wall.) Schau. [Sembilan]

Sphenodesme pentandra Jack [Malacca]

Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Malacca, Penang, & Singapore]

Teijsmanniodendron hollrungii (Warb.) Kosterm. [Malacca]

Vitex coriacea C. B. Clarke -- to be deleted

Vitex hollrungii Warb. -- to be deleted

Vitex negundo L. [Malacca]

Vitex quinata (Lour.) F. N. Will. [Malacca]

Vitex vestita Wall. [Singapore]

LIUKIU ISLANDS:

Callicarpa japonica var. luxurians Rehd. [Okinawa]

Clerodendrum inerme (L.) Gaertn. [Oshima]

Clerodendrum trichotomum var. ferrugineum Nakai

Eriocaulon sexangulare L. [Okinawa]

PHILIPPINE ISLANDS:

Gmelina palawensis var. dinagatensis Moldenke [Dinagat]*

Premna benguetensis C. B. Robinson is the correct orthography

Vitex parviflora A. L. Juss. [Basilan & Ticao]

Vitex trifolia L. [Polillo]

Vitex trifolia var. heterophylla (Mak.) Moldenke [Luzon]

Viticipremna philippinensis (Turcz.) H. J. Lam -- delete the asterisk

RIOUW ARCHIPELAGO:

Petrea volubilis L. [Bintan]

Sphenodesme barbata (Wall.) Schau. [Bakong & Bedjai]

LINGGA ARCHIPELAGO:

Petraeovitex trifoliata Merr. [Singkep]

SUMATRA:

- Duranta repens L.
Holmskioldia sanguinea Retz.
Petraeovitex sumatrana H. J. Lam -- delete the asterisk
Petrea volubilis L.
Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Teijsmanniodendron sarawakanum (H. H. W. Pearson) Kosterm.
Teijsmanniodendron subspicatum (H. Hallier) Kosterm.
Verbena tenuisecta Briq.
Vitex coriacea C. B. Clarke -- to be deleted
Vitex hollrungii Warb. -- to be deleted
Vitex subspicata H. Hallier -- to be deleted
Vitex trifolia var. heterophylla (Mak.) Moldenke

JAVA:

- Congea velutina Wight
Verbena officinalis L.
Verbena tenuisecta Briq.
Vitex trifolia var. heterophylla (Mak.) Moldenke
Viticipremna philippinensis (Turcz.) H. J. Lam

ANAMBAS ISLANDS:

- Teijsmanniodendron holophyllum (J. G. Baker) Kosterm.

BRITISH NORTH BORNEO:

- Eriocaulon beccarii Suesseng. & Heine
Petraeovitex elmeri Merr. -- to be deleted
Petraeovitex sumatrana H. J. Lam
Sphenodesme triflora Wight
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Vitex hollrungii Warb. -- to be deleted

SARAWAK:

- Sphenodesme triflora Wight
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Teijsmanniodendron sarawakanum (H. H. W. Pearson) Kosterm.
Teijsmanniodendron smilacifolium (H. H. W. Pearson) Kosterm.
Teijsmanniodendron subspicatum (H. Hallier) Kosterm.
Vitex hollrungii Warb. -- to be deleted
Vitex sarawakana H. H. W. Pearson -- to be deleted
Vitex smilacifolia H. H. W. Pearson -- to be deleted
Vitex subspicata H. Hallier -- to be deleted

BORNEO:

- Callicarpa kinabaluensis Bakh.*
Congea velutina Wight
Eriocaulon beccarii Suesseng. & Heine
Petraeovitex elmeri Merr. -- to be deleted
Petraeovitex sumatrana H. J. Lam

- Petraeovitex ternata H. Hallier -- to be deleted
Petraeovitex ternata var. glabrior H. J. Lam -- to be deleted
Petraeovitex trifoliata Merr.
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Teijsmanniodendron holophyllum (J. G. Baker) Kosterm.
Teijsmanniodendron pteropodum var. auriculatum Kosterm.*
Teijsmanniodendron sarawakanum (H. H. W. Pearson) Kosterm.
Teijsmanniodendron smilacifolium (H. H. W. Pearson) Kosterm.
Teijsmanniodendron subspicatum (H. Hallier) Kosterm.
Vitex hollrungii Warb. -- to be deleted
Vitex smilacifolia H. H. W. Pearson -- to be deleted
Vitex subspicata H. Hallier -- to be deleted

CELEBES:

- Gmelina palawensis var. celebica Moldenke*
Premna tomentosa Willd.
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Vitex hollrungii Warb. -- to be deleted

KANGEAN ARCHIPELAGO:

- Duranta repens L. [Kangean]

LESSER SUNDA ISLANDS:

- Gmelina asiatica var. villosa Bakh. -- to be deleted
Pygmaeopremna herbacea (Roxb.) Moldenke [Soemba]
Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Banka]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Banka]
Vitex hollrungii Warb. -- to be deleted

MOLUCCA ISLANDS:

- Callicarpa caudata Maxim. [Amboina]
Clerodendrum obovatum (Roxb.) Walp.*
Gmelina moluccana (Blume) Backer [Buru, Halmahera, Ternate, & Tobelo]
Petraeovitex multiflora (J. E. Sm.) Merr. [Ceram]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Amboina, Buru, Ceram, & Sula]
Vitex hollrungii Warb. -- to be deleted
Vitex quinata (Lour.) F. N. Will. [Amboina]

NEW GUINEA:

- Callicarpa caudata Maxim. [Northeastern New Guinea & Papua]
Clerodendrum cunninghamii Benth. [Northeastern New Guinea]
Premna regularis H. J. Lam [Northeastern New Guinea]
Pygmaeopremna sessilifolia (H. J. Lam) Moldenke [Northeastern New Guinea]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Dutch New Guinea]
Vitex hollrungii Warb. -- to be deleted

BISMARCK ARCHIPELAGO:

- Duranta repens L. [New Ireland]

SOLOMON ISLANDS:

Petraeovitex multiflora var. salomonensis Bakh. -- to be deleted

Petraeovitex sumatrana var. salomonensis (Bakh.) Moldenke
[Bougainville]*

AUSTRALIA:

Premna acuminata R. Br. [Western Australia]

Vitex guajaci Ettingsh. -- to be deleted

THURSDAY ISLAND:

Glossocarya hemiderma (F. Muell.) Benth.

NEW ZEALAND:

Teuclidium parvifolium var. luxurians Cheesem.*

SOCIETY ISLANDS:

Vitex trifolia var. simplicifolia Cham. [Tahiti]

CULTIVATED:

Aloysia casadensis Hassler & Moldenke [New York]

Aloysia chamaedryfolia Cham. [Belgium]

Aloysia virgata var. platyphylla (Briq.) Moldenke [Argentina
& Paraguay]

Bouchea pseudochascanum (Walp.) Grenz. [Java]

Caryopteris incana f. candida (Schneid.) Hara [New York]

Caryopteris odorata (Hamilton) B. L. Robinson [Southern Rhodesia]

Caryopteris paniculata C. B. Clarke [India]

Citharexylum berlandieri B. L. Robinson [New York]

Citharexylum kerberi Greenm. [Java]

Citharexylum pentandrum Vent. [Java]

Citharexylum schottii Greenm. [Java]

Citharexylum tristachyum Turcz. [Java]

Clerodendrum aculeatum (L.) Schlecht. [Belgian Congo]

Clerodendrum discolor var. oppositifolium Thomas [New York]

Clerodendrum indicum (L.) Kuntze [Louisiana]

Clerodendrum infortunatum L. [India]

Clerodendrum laevifolium Blume [Belgium]

Clerodendrum myricoides var. camporum Gürke [Belgium]

Clerodendrum speciosissimum Van Geert [Belgian Congo]

Clerodendrum splendens G. Don [China & Cuba]

Clerodendrum ugandense Prain [New York]

Clerodendrum umbellatum var. asperifolium (Thomas) Moldenke
[Belgian Congo]

Clerodendrum umbellatum var. speciosum (Dombrain) Moldenke
[Brazil & Cuba]

Congea tomentosa Roxb. [Puerto Rico]

Congea tomentosa var. azurea (Wall.) C. B. Clarke [Cuba, Hispaniola, India, Java, & Trinidad]

Congea velutina Wight [Canal Zone, Sarawak, & Straits Settle-

ments]

- Congea vestita Griffith [Java & New York]
Duranta repens L. [Java]
Duranta repens var. alba (Masters) L. H. Bailey [Java]
Duranta stenostachya Tod. [Java]
Gmelina arborea Roxb. [Java]
Gmelina arborea var. glaucescens C. B. Clarke [Java]
Gmelina elliptica J. E. Sm. [Java]
Gmelina philippensis Cham. [Java]
Holmskioldia sanguinea Retz. [Belgian Congo & Java]
Hymenopyramis brachiata Wall. [Java]
Junellia illapelina (R. A. Phil.) Moldenke [England]
Junellia thymifolia (Lag.) Moldenke [England]
Junellia tridens (Lag.) Moldenke [England]
Lantana achyranthifolia Desf. [Belgium]
Lantana annua L. [Belgium]
Lantana camara var. mista (L.) L. H. Bailey [New York]
Lantana camara var. mutabilis (Hook.) L. H. Bailey [Belgium]
Lantana camara var. sanguinea (Medic.) L. H. Bailey [New York]
Lantana glandulosissima Hayek [Belgium]
Lantana horrida H.B.K. [Louisiana]
Lantana involucrata L. [Austria & Belgium]
Lantana mearnsii var. congolensis Moldenke [Belgian Congo]
Lantana ovatifolia Britton [New York]
Lantana stricta Sw. [Belgium]
Lantana tiliaefolia Cham. [Belgian Congo]
Lantana urticaefolia Mill. [New York]
Lippia multiflora Moldenke [Belgian Congo]
Monochilus gloxinifolius Fisch. & Mey. [Belgium]
Peronema canescens Jack [Sumatra]
Petrea volubilis L. [Belgian Congo & Belgium]
Phyla cuneifolia (Torr.) Greene [New York]
Phyla nodiflora (L.) Greene [Belgium]
Phyla nodiflora var. canescens (H.B.K.) Moldenke [France]
Phyla nodiflora var. rosea (D. Don) Moldenke [Germany].
Sphenodesme involucrata (Presl) B. L. Robinson [India & Java]
Sphenodesme pentandra Jack [India]
Stachytarpheta jamaicensis (L.) Vahl [Austria & New York]
Syngonanthus elegans (Körn.) Ruhl. [Brazil & New York]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [India]
Timotocia integrifolia var. fischeri (Mart.) Moldenke [Belgium]
Verbena alata Cham. [England, France, & Germany]
xVerbena baileyana Moldenke [Austria]

- Verbena bipinnatifida var. latilobata Perry [Belgium]
Verbena bonariensis L. [Belgian Congo, Java, & Romania]
Verbena bonariensis var. conglomerata Briq. [Belgium & New York]
Verbena brasiliensis Vell. [Belgium & Uruguay]
Verbena canadensis (L.) Britton [Java]
Verbena chamaedryoides Hoffm. — to be deleted
Verbena corymbosa Ruiz & Pav. [England]
Verbena curtisii Moldenke [Belgium]
Verbena dissecta Willd. [Massachusetts]
Verbena halei Small [Massachusetts]
Verbena halei x lasiostachys Dermen [Massachusetts]*
Verbena halei x neomexicana Dermen [Massachusetts]*
Verbena halei x officinalis Dermen [Massachusetts]*
Verbena hastata L. [New York]
Verbena hastata x spuria Haartman [Sweden]*
Verbena hispida Ruiz & Pav. [Belgium]
Verbena hispida x officinalis Dermen [Massachusetts]*
Verbena hispida x simplex Dermen [Massachusetts]*
Verbena hispida x urticifolia Dermen [Massachusetts]*
xVerbena hybrida Voss [Austria, Belgian Congo, India, Java, & Netherlands]
Verbena incisa Hook. [Austria & Belgium]
Verbena laciniata (L.) Briq. [Massachusetts]
Verbena laciniata x dissecta Dermen [Massachusetts]*
Verbena laciniata x megapotamica Dermen [Massachusetts]*
Verbena laciniata x phlogiflora Dermen [Massachusetts]*
Verbena laciniata var. contracta (Lindl.) Moldenke [England]*
Verbena laciniata var. sabini (Sweet) Moldenke [England]*
Verbena lasiostachys Link [Belgium & Massachusetts]
Verbena litoralis H.B.K. [Java & New York]
Verbena megapotamica Spreng. [Massachusetts]
xVerbena moechina Moldenke [Belgium]
Verbena neomexicana (A. Gray) Small [Massachusetts]
Verbena officinalis L. [Java, Massachusetts, & Sweden]
Verbena officinalis x Veronica maritima Haartman [Sweden]*
Verbena peruviana (L.) Britton [Massachusetts]
Verbena peruviana x phlogiflora Dermen [Massachusetts]*
Verbena peruviana var. glabriuscula Kuntze [Belgium]
Verbena peruviana f. rosea Moldenke [England]
Verbena phlogiflora Cham. [Massachusetts]
Verbena platensis Spreng. [Belgium]
Verbena radicans Gill. & Hook. [England]
Verbena recta H.B.K. [Belgium]
Verbena rigida Spreng. [India & Java]

- Verbena santiaguensis (Covas & Schnack) Moldenke [Massachusetts]
- Verbena santiaguensis x megapotamica Dermen [Massachusetts]*
- Verbena scrobiculata Griseb. [Brazil]
- Verbena simplex Lehm. [Massachusetts]
- Verbena stricta Vent. [Belgium]
- Verbena sulphurea D. Don [Belgium]
- Verbena tenera Spreng. [Belgian Congo]
- Verbena tenuisecta Briq. [Belgian Congo & Java]
- Verbena tenuisecta var. alba Moldenke [Java]
- Verbena urticifolia L. [Belgium, Massachusetts, & New York]
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- Verbena urticifolia x neomexicana Dermen [Massachusetts]*
- Verbena xutha Lehm. [New York]
- Vitex agnus-castus L. [Cuba & Southern Rhodesia]
- Vitex hollrungii Warb. -- to be deleted
- Vitex negundo L. [California & Réunion]
- Vitex negundo var. intermedia (P'ei) Moldenke [Java]
- Vitex pinnata L. [Madagascar & Réunion]
- Vitex trifolia L. [Belgium, Johnston Island, & Réunion]
- Vitex trifolia var. heterophylla (Mak.) Moldenke [Belgium]

ADDITIONAL NOTES ON THE ERIOCAULACEAE. VI

Harold N. Moldenke

ERIOCAULON CINEREUM R. Br.

The species ascends to 5200 feet in Kashmir.

Additional citations: INDIA: Kashmir: Koelz 9040 (N).

ERIOCAULON DECANGULARE L.

The common name "Late Eriocaulon" is given for this species in "The Carolinian Florist of Governor John Drayton of South Carolina", p. 14 (1943), where it is called Eriocaulon serotinum Walt.

ERIOCAULON SIGMOIDEUM C. Wright

The specimens cited below were mis-identified as E. fuliginosum C. Wright by the collector. It has been collected in anthesis in September.

Additional citations: CUBA: Pinar del Rio: C. F. Baker 2098 (Es, Po--185877).

ERIOCAULON TEXENSE Körn.

Additional citations: TEXAS: Houston Co.: Warner s.n. [Grape-

land Bog, May 30th, '36] (Hu). Jefferson Co.: G. L. Fisher 38037 (Gg--276679). Leon Co.: F. A. Barkley 13556 (Au, N). Milam Co.: Tharp 4434c (Au, N), 4434d (N), 4434b (N, N). Robert-son Co.: Painter & Barkley 13540 (Gg--321530, N, N); Rowell 8050 (N), 8138 (N).

ERIOCAULON THWAITESII Körn.

Additional citations: INDIA: Madras: E. Barnes B.9a (F--photo, K, N, N--photo, Sg--photo, Z--photo).

ERIOCAULON TOGOËNSE Moldenke

Synonym: Eriocaulon xeranthemoides Van Heurck & Muell.-Arg. in Van Heurck, Obs. Bot. 103. 1870 [not E. xeranthemoides Bong., Act. Petrop. Sci. Math., sér. 4, 1: 635. 1831].

ERIOCAULON TRILOBATUM Ruhl.

Additional citations: MADAGASCAR: Hildebrandt 3715 (F--photo of isotype, N--isotype, N--photo of isotype, Sg--photo of isotype, W--808235--isotype, Z--photo of isotype).

ERIOCAULON TRUNCATUM Hamilt.

The species inhabits dried mud of rice paddies, dry ditches, extensive open acid waste plains, open grassy places, rice fields, and wet places in general. It has been collected from sea level to 1300 m. altitude, in flower and fruit in August, September, and December, and in fruit in June. It has been misidentified as E. cinereum R. Br., E. merrillii Ruhl., E. quinquangulare L., E. sieboldianum Sieb. & Zucc., E. gracile Mart., and E. sikokianum Maxim. Steward, Chiao, & Cheo describe the "scales" as "chalky-white".

Additional citations: INDIA: Assam: Masters s.n. (K). Madras: J. S. Gamble 44771, in part (K). West Bengal: Helfer 136 (Bt, W--1669080). Province undetermined: R. Wight 2368 (K). BURMA: Royle s.n. (D--824287). CHINA: Kiangsi: H. C. Cheo 386 (Gg--276708); Tsiang 9968 (N), 10532 (N), 10785 (N). Kwangtung: E. Sampson s.n. [Canton] (Pa). Kweichow: Steward, Chiao, & Cheo 441 (N). Province undetermined: E. Faber s.n. (N). HONAM ISLAND: E. D. Merrill 9830 (Gg--105747). JAPAN: Kiushiu: Ichikawa 20046 (D--627659). HAINAN ISLAND: Liang 66137, in part (N). FRENCH INDO-CHINA: Annam: Kuntze 3671 (N). Tonkin: Poilane 8061 (N), 8071 (N), 8073 (N), 8083 (N). PHILIPPINE ISLANDS: Luzon: M. K. Clemens s.n. [Manila, Sept. 1923] (Or--18404); Elmer 44350 (N); E. D. Merrill 3624 (N).

ERIOCAULON USSURIENSE Körn.

Additional citations: UNION OF SOCIALIST SOVIET REPUBLICS: Far Eastern Territory: Melvil s.n. [31/VIII/1926] (Mg).

ERIOCAULON VAGINATUM Körn.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 9496 [Herb. Jard. Bot. Belo Horiz. 24032] (N); Mendes Magalhaes 307 [Herb. Jard. Bot. Belo Horiz. 32582] (N), 483 [Herb. Jard. Bot. Belo Horiz. 34543] (N). Paraná: Collector undesignated 35 [Herb. Mus. Parana. 1944] (N); G. Jönsson 933a (D-653628); Tessmann 3382 [Herb. Mus. Parana. 3382] (N). Rio Grande do Sul: Fridrichs s.n. [Rambo 30670] (N).

ERIOCAULON VANHEURCKII Muell.-Arg.

Synonym: Eriocaulon vanheureckii Muell.-Arg. apud Razi, Journ. Mysore Univ. 7 (4): 77, sphalm. 1946.

Razi, in the reference cited above, records this species from Mysore and describes it as a geophyte.

ERIOCAULON VOLKENSII Engl.

The species has been collected along a damp path in a savanna at Mount Kilimanjaro, altitude 9000 feet, blooming in July.

Additional citations: UGANDA: R. H. Goodwin 68 (F-photo, G, N, N-photo, Z-photo). KENYA: Mearns 1480 (W-631535).

ERIOCAULON WIGHTIANUM Mart.

The binomial is sometimes accredited to "Meat." on herbarium labels. The species is recorded from Mysore by B. A. Razi in Journ. Mysore Univ. 7 (4): 77. 1946, and described by him as a geophyte.

Additional citations: INDIA: Bombay: Ritchie 1244 (T). West Bengal: Helfer 135 (Bt, W-1669079). BURMA: Tenasserim: Helfer 5584 (C); T. B. McClelland s.n. [Rangoon] (K); Wallich 6078 (K).

ERIOCAULON WOODII var. MINOR Ruhl.

Additional citations: UNION OF SOUTH AFRICA: Natal: Rudatis 1420 (F-photo, N, N-photo, Sg-photo, W-633806, Z-photo).

ERIOCAULON WOODSONIANUM Moldenke

The original collection of this species was made at the margin of a pool in a savanna along the road between Panamá and Chepo, flowering in November.

Additional citations: PANAMA: Panamá: Dodge, Hunter, Steyermark, & Allen 16717 (E-1120005--type, N-photo of type, Z-photo of type).

ERIOCAULON XERANTHEMUM Mart.?

Additional citations: INDIA: Madras: J. S. Gamble 14771, in part (K).

ERIOCAULON YUNNANENSE Moldenke

Additional citations: CHINA: Yunnan: A. Henry 12362 (N-type).

LACHNOCAULON ANCEPS (Walt.) Morong

Synonyms and literature: Bull. Torrey Bot. Club 18: 360. 1891; Britton & Br., Ill. Fl., ed. 1, 1: 373, fig. 903. 1896; W. Ruhland in Engler, Das Pflanzenreich 4 (30): 240, fig. 36. 1903; Small, Fl. Southeast. U. S. 235. 1903; Robinson & Fern. in Gray's Man., ed. 7, 262. 1908; Fernald, Rhodora 39: 395 & 480. 1937; Fernald, Rhodora 40: 402. 1938; Moldenke, N. Am. Fl. 19: 50. 1937. Eriocaulon anceps Walt., Fl. Carol. 83. 1788; The Carolinian Florist of Governor John Drayton of South Carolina, p. 14. 1943. Eriocaulon villosum Michx., Fl. Bor.-Am. 2: 166. 1803; Pursh, Fl. Am. Sept. 1: 92. 1814; Nutt., Gen. 1: 90. 1818; Roem. & Schult., Syst. 2: 866. 1817; Ell., Bot. S. Car. & Ga. 2: 566. 1824. Lachnocaulon michauxii Kunth, Enum. Pl. 3: 497. 1841; Körn., Linnaea 27: 565. 1854; Chapm., Fl. South. U. S. 504. 1860. Sacnocaulon anceps Cuthbert, in herb. Lachnanthes michauxii Kunth, in herb.

According to the information on their labels, collectors have found this species in moist pine barrens, peaty excavated areas in savannas and sides of ponds, shrub bogs, grassy swamps, damp pinebarrens, damp grassy fields, low sandy ground, open flat woods, sphagnous bogs, longleaf pine flatwoods, wet places in damp pine woods, moist sandy soil bordering bogs, longleaf pine savannas, wet grassy sand, low pinelands near lake shores, low moist sandy soil along small open ditches, wet mud in roadside ditches, wet muddy soil and low wet meadows, moist rich sinks in savannas, roadside ditches, sand ridges, wet meadows, dry sterile white sand beneath Pinus palustris and Quercus virginiana, peaty soil in open woods, peaty meadows, moist pinebarrens, edges of wet meadows, moist mucky recently cleared soil, moist black soil of low ground, and pine woods bordering peaty swales and open bushy or wooded swamps. It is said to form large tufts in moist meadows and continuous turf in sphagnous bogs. It has been collected in flower and fruit from February to August. The Curtiss s.n. at the Carnegie Museum is a mixture with Xyris; the Frye s.n. at Morgantown has the peduncles very much twisted. Stuhr s.n. at Oregon State College is a mixture with grasses.

The R. K. Godfrey s.n. (Plant. Exsicc. Gray. 926) is often cited as L. minus and resembles that species. However, it seems to be a good match for depauperate forms of L. anceps and so had perhaps better be placed here. The collector on F. Harper 259 notes that its very small heads are "possibly due to drought".

The species has been confused by collectors and herbarium workers with Eriocaulon compressum Lam., E. gnaphaloides Michx., Lachnocaulon minus (Chapm.) Small, L. beyrichianum

Sporleder, "L. digynum Holm", and Syngonanthus flavidulus (Michx.) Ruhl.

Common names recorded include "hairy pipewort" and "hat pins", while Drayton's Carolinian Florist (cited above) gives the name "double eyed or edged eriocaulon".

Additional citations: VIRGINIA: Caroline Co.: F. J. Hermann 10774 (N). Greensville Co.: Smith & Hodgdon s.n. [Plant. Exsicc. Gray. 1028] (Al, Ba, Dp--21803, Du--277489, Gg--284473, Gu--21608, H--67354, I, Mg, Ms, Ms, N, N, Po--257854, Ur, We); Fernald & Long 8630 (Po--354757). Sussex Co.: Fernald & Long 8181 (Ba, Du--276754, Gg--316196). NORTH CAROLINA: Beaufort Co.: Wiegand & Manning 682 (Po--216757). Bladen Co.: Ashe s.n. [May 20, 1896] (Ur); Blomquist 5741 (H--9661); A. A. Heller 14102 (Du--157977); Oosting 3555 (H--28954). Brunswick Co.: Billings 384 (Bt--45290). Columbus Co.: P. O. Schallert s.n. [Nakina, 5-25-34] (Bt--25886), s.n. [Nakina, 12/20/34] (Or--34028), s.n. [Pireway, 8/4/33] (Ga). Craven Co.: D. S. Correll 1467 (H--34043). Duplin Co.: D. S. Correll 1320 (H--34045). Greene Co.: Godfrey 4316 (H--22275). Harnett Co.: Blomquist 10847 (H--55537); Blomquist & Correll 2524 (H--34044); Godfrey 4253 (H--9170). Hoke Co.: D. S. Correll 1120 (H--34086). Iredell Co.: M. E. Hyams 162 (Ob--23920), 10872 (Se--4139), s.n. [Statesville] (Po--119239). Johnston Co.: M. A. Chase 3102 (Ur, Ur). Lenoir Co.: Randolph & Randolph 785 (Ba). Martin Co.: Drushel 10141 (Vt). Moore Co.: B. Knipe s.n. [Pine Bluff, June & July 1901] (Cm); P. O. Schallert s.n. [9/1/40] (N). New Hanover Co.: R. K. Godfrey s.n. [Plant. Exsicc. Gray. 926] (Al, Du--267148, I, Mg, Po--254450, Se--65178, Ur, We); M. A. Chase 3153 (Ur). Onslow Co.: Randolph & Randolph 947 (Ba). Pender Co.: S. F. Blake 11905 (Gg--290806). Richmond Co.: D. S. Correll 1086 (H--34039). Robeson Co.: D. S. Correll 1242 (H--34046); G. J. Schallert s.n. [7/4/40] (Gg--316197); P. O. Schallert s.n. [7/4/40] (Bt--53896, Or--43109). Sampson Co.: Godfrey 4511 (H--22750). Scotland Co.: D. S. Correll 1190 (H--34034). Wake Co.: Buell 1934 (H--71192). County undetermined: Ashe 2287 [Middle N. C.] (Ur); M. E. Hyams s.n. [Eastern N. C.] (Pa), s.n. [N. Carolina] (Ut). SOUTH CAROLINA: Darlington Co.: J. B. S. Norton s.n. [July 28, 1920] (Al). Dorchester Co.: Hexamer & Maier s.n. [Summerville, May 26, '55] (Cm). Georgetown Co.: Godfrey & Tryon 51 (Gg, H--58710, N). Hampdon Co.: Wiegand & Manning 686 (Po--216758). Horry Co.: P. O. Schallert s.n. [Wampee, 8/4/33] (Bt--18713). Lexington Co.: Godfrey & Tryon 1210 (N). Orangeburg Co.: A. S. Hitchcock s.n. [Orangeburg, Aug. 17, 1905] (Ur). County undetermined: A. W. Chapman s.n. (Pr). GEORGIA: Brantley Co.: Pyron & McVaugh 303 (Gu--13063).



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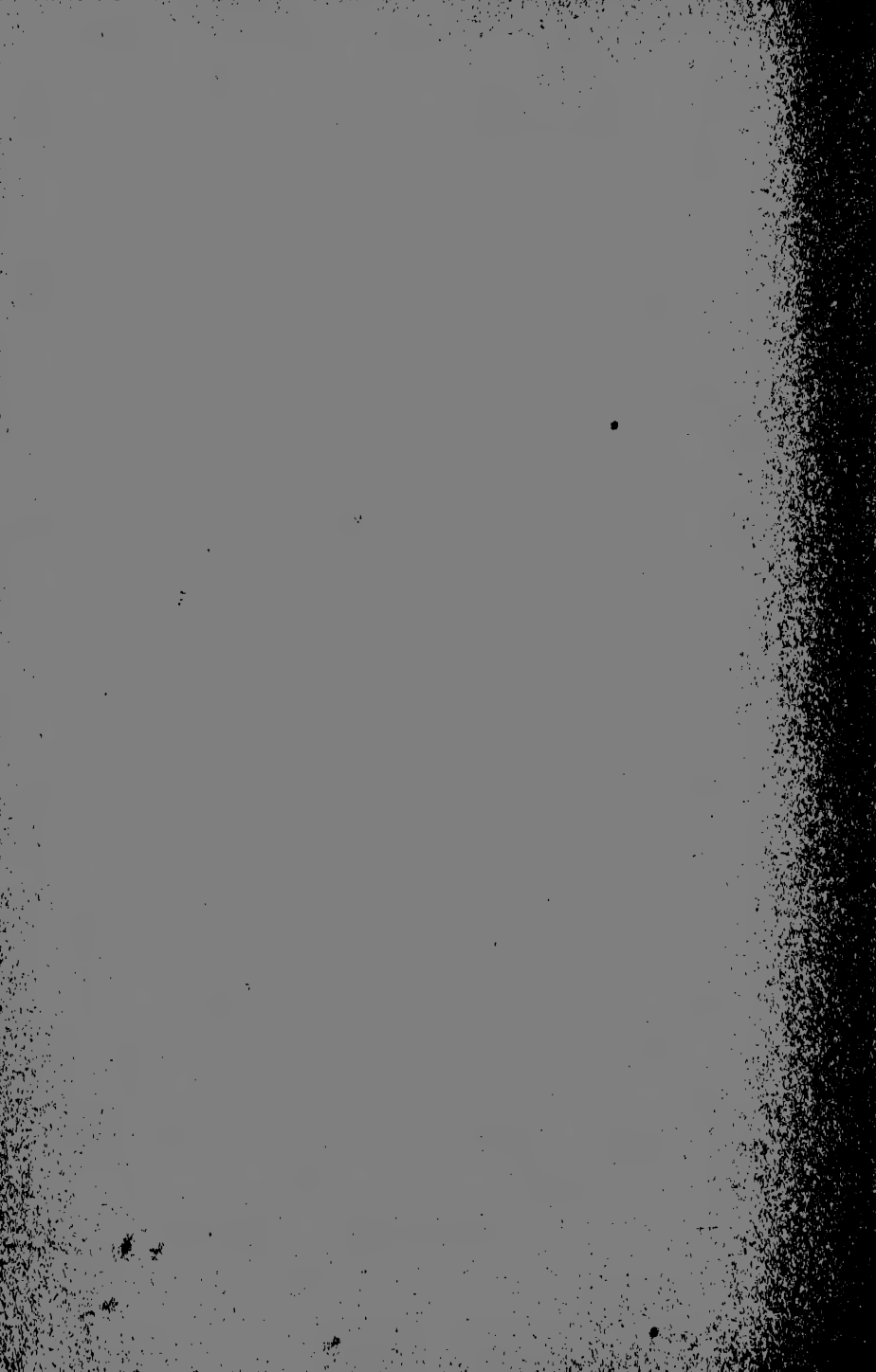
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FURTHER NOTES ON DRYING PLANT SPECIMENS BETWEEN
SHEETS OF MOISTURE-PERMEABLE PLASTIC FILMS

Hamilton P. Traub, Principal Physiologist, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Maryland

Since the brief note on the subject of drying plant specimens between sheets of moisture-permeable plastic films was published (Traub, 1950, April), additional experience with the method has been gained. This is the reason for the present report.

Thicker films. It has been found that the use of thicker moisture-permeable films represents an improvement. Thus cellulose acetate 200-CA-43 (Du Pont) and cellophane 600 PT (Du Pont), particularly the former, give better results. These thicker films give more rigid preparations which make for ease in handling, and apparently tend to reduce any later tendency to wrinkling, particularly when cellulose acetate 200-CA-43 (Du Pont) is used. This latter is indicated as first choice for the purpose.

Drying temperature. It was found that in case of the Amaryllidaceae, as delimited by Hutchinson (1934), the drying can be completed over a period of 24 hours or more in the mechanical convection type (forced draft) drying oven at 60° C., without causing any brittleness in the specimens. However, this is not the case with some plants, such as Alstroemeria, Phaseolus, and Ulmus species. Plants in this drying class should be dried between films in a drying box with electric light bulbs as the source of heat (Archer, 1945; Traub, 1950) or under similar conditions. If the mechanical convection type oven is used at all, the specimens should be left in the oven for only a minimum period at 55° C. or lower, and should then be transferred to the drying box with electric light bulbs for completion of drying.

Thus, it would seem important to recognize that different types of plants may require somewhat different treatment for drying as indicated above. Such requirements could of course be determined only by actual experiments.

Fleshy parts. Some fleshy parts, such as the peduncle of large amaryllids like Hymenocallis, Amaryllis L., and Crinum, which are difficult to dry in the usual manner or between films, because of the excessive moisture to be removed and the efficient epidermal covering of the parts, even with heat killing, may be easily dried if they are split lengthwise and the halves are dried between films. As a record of the part in cross-section, thin cross-sectional slices, made before the longitudinal splitting, are dried separately between

small pieces of film. This must be done under moderate, but sufficient pressure; otherwise there is shrinkage of the thin sections. For this purpose a small press may be improvised by placing the slices, with the film on either side, between several thicknesses of blotting paper and weighting them down with books or other convenient heavy objects. As indicated, the pressure should not be so great as to crush the slices.

Delicate parts. Similarly, with delicate parts such as sepals, petals and stamens which do not have a relatively large amount of total moisture to be removed, the operation may be performed just as indicated, or it may be carried out in the conventional press in the drying cabinet provided with electric light bulbs, or even without them.

Restoration of dried material. When floral or other plant parts from poorly prepared herbarium specimens are to be restored, or parts of them are to be restored for detailed study, they are soaked in hot water in a shallow rectangular tray, which can be placed under a lens illuminated with fluorescent light (Stocker & Yale unit) for convenient inspection and dissection. A piece of cellulose acetate film is then placed under the specimen in the water, the straightening out, or dissection if desired, can be carried out, and the water is then gradually removed by means of a large dropping pipette so that the specimen remains spread out on the wet film. Another sheet of cellulose acetate film which has been previously moistened is then carefully placed over it. Care is necessary since there is a tendency for the two sheets to repel each other, apparently because they have similar electric charges. The preparation is then placed between blotters in the usual botanical press and dried as recommended by Traub (1950). The dried preparations are then stapled to the herbarium sheet to which they belong.

Types of drying ovens. Since the note by Traub (1950, April) appeared, Gates (1950, June) has published a stimulating paper on the advantages of oven drying herbarium specimens. He used the gravity convection type oven, but stated in a footnote that an electric fan might be installed to advantage, in order to obtain speedier movement of the vapor-laden air. This suggestion for the use of the mechanical convection type oven is in harmony with the recommendation of Traub (1950), who had previously used an available model (Model 1202 Hotpack mechanical convection oven) for the same purpose. Dr. Gates illuminated the subject by pointing out that a vast volume of water vapor has to be removed in the drying process, and this should be a point in favor of the mechanical convection type oven since this removes the vapor laden air more rapidly than the gravity convection type oven.

The temperature range, 60°--65° C. (140° F.--149° F) for drying herbarium specimens in the mechanical type oven was

originally chosen by Traub (1950) as a starting point because this is the temperature range he uses for the preparation of plant tissues for chemical analyses. The objective of using a relatively low temperature range is to reduce possible changes in the tissues. In this range it was recommended that the herbarium specimens were to be dried in the mechanical convection type oven for a few hours. Since the drying of plant tissues involves also a cooling process due to the evaporation of moisture, the actual temperature of the tissues would be somewhat below the range indicated. With longer drying under the conditions, it is possible that a somewhat lower temperature range might prove optimal, a point that has not as yet been established. As stated above, Traub has recently used 60° C. (140° F.) for drying amaryllid specimens over 24 hours or more with success, but no experiments have been made to determine the optimal temperature. With the less efficient gravity convection type oven, Dr. Gates (1950, June) indicated 140° F. (60° C.) as the probable beginning of "over high" temperature for drying specimens and 120° F. (48.9° C.) as the probable optimal temperature; and he actually used 110° F. (43.3° C.) in his herbarium practice. These statements are in essential harmony with those of Traub. The greater evaporation rate per unit time would tend to keep the actual temperature of the plant material somewhat lower than that indicated by the thermometer of the mechanical convection type oven used, as contrasted with a relatively higher temperature of the specimens when the gravity convection type oven is used. Further experiments are needed in order to establish the optimal temperature ranges for each type of oven.

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NOVELTIES IN STROPHANTHUS

Joseph V. Monachino

In the course of a thorough revision of the genus Strophanthus over 3000 specimens were examined by the writer. Besides the herbarium sheets deposited in some 25 of the principal botanical institutions of the world, he studied the botanical material of recent expeditions initiated chiefly for the purpose of collecting Strophanthus.

So great was the interest in the genus as a possible precursor of cortisone, that no less than six expeditions explored Africa within the years 1949--1951. These expeditions had the definite object in mind to collect as many different species of the group as possible. The best collection examined by the writer was that of the Upjohn-Penick Expedition, headed by L. J. Brass and E. F. Woodward. The first set of this collection is now deposited with the New York Botanical Garden. The specimens obtain in Merck Research Laboratories "Strophanthus Expedition" to the west coast of Africa have not yet been distributed. J. Gerstner, A. Katz, J. Schmutz, P. Speiser, Dr. Hess and others located in most of the chief provinces of Africa have collected for T. Reichstein. A complete series of the specimens collected for the United States Public Health Service and the Division of Plant Exploration and Introduction by J. T. Baldwin Jr. is at the United States National Herbarium; and one collected for the Medical Research Council by R. D. Meikle in Nigeria is at the Royal Botanic Gardens at Kew.

The writer has seen at least most of the collections of the five expeditions mentioned above, and also freshly prepared material sent directly by individuals and institutions located in various places in Africa, and a few in Asia.

The plants collected by the French workers, R. Schnell and A. Chevalier, have not been examined by the writer. Schnell (6) suggested provisionally and informally three new varieties of Strophanthus hispidus and described without naming two forms or types of S. sarmentosus. Professor Reichstein informs the writer that he analyzed chemically the seeds of Schnell's different forms of S. sarmentosus and found practically no difference between them. Chevalier (3) named two forms of S. sarmentosus based on old species (S. senegambiae and S. Paroissei), and remarked on the variation in toxicity of the plants found in different regions. He added that the species is variable but that he was not able to distinguish stable varieties even in the living plants. The cultivated plants of S. hispidus seemed to him to belong to a race apart from the Fout-Djallon forest type. Late in 1950 Chevalier described S. punctiferus from the

vicinity of Abidjan. The type has not been available, but the writer examined a fresh collection from the type locality sent by Jacques Miège, who wrote that it was from the plant which he collected at Vridi and which Chevalier described under the name of S. punctiferus. The species is hardly distinct from the polymorphic S. sarmentosus.

Despite the extensive collections and close attention that has been focused on the genus by excellent workers, no other entity in it has been described in recent time. The writer, now having completed his exhaustive survey, has likewise failed to discover any very striking novelty. In every case when a plant distributed as Strophanthus appeared outstanding, examination proved it to be a member of Alafia, Cryptolepis, Pentopetia, Motandra, Rhynchodia, Pycnobotrya, or some other genus not related to Strophanthus. The one species that he thinks advisable to describe is very closely related to S. Preussii, and, furthermore, has already been given an herbarium name by Gilg. Two trivial varieties and three forms are also herewith proposed.

STROPHANTHUS ZIMMERMANNIANUS Monachino, sp. nov.

S. Zimmermannianus Gilg, chironym; Gilg ex Braun, Der Pflanze 6 (19): 299. 1910, nom. nud.

S. Preussii valde similis, differt lobis paracorollae deltoideo-lanceolatis valde longioribus quam latioribus et tubo corollae intus supra stamina glabro vel obscure papilloso non insigniter maculato.

Type: Zimmermann 1496, Tanganyika, Usambara, Ngonyaberg (Gonja), alt. 800 m., 15 Dec. 1907, "Strauch mit gelben Bl. Schuppen braun," deposited at the East African Herbarium (formerly Amani).

Additional specimens examined: Omari bin Bakari A H 9787, Tanganyika, "Usambaras, Sigi-Kisiwani, ca. 1500 ft. alt., 4 June 1941, a glabrous leaved liane, fruits up to 36 in. long, with a blunt lobed tip;" deposited at the East African Herbarium and the Royal Botanic Gardens at Kew.

A photograph of Omari bin Bakari A H 9787 appears in the Journal of the New York Botanical Garden 51 (610): 239. October 1950.

The species is very closely allied with the typical glabrous leaved variety of S. Preussii. S. Barteri and S. gracilis also belong in the same grouping, but these two are confined to West Africa.

The flowers of the Zimmermann specimen are badly damaged. The corolla-lobes are tailed, but their lengths cannot be observed because of their damaged condition. The follicles are slender and with dilated tips as in S. Preussii. The leaf-blades are more membranaceous and the old ones have clearer reticulation than is usual for S. Preussii, in this respect re-

sembling the leaves of S. Barteri. S. Zimmermannianus further resembles S. Barteri in the elongated-deltoid shape of the paracorolla-lobes.

S. Preussii is found in West Africa, the Belgian Congo where it reaches its greatest development, and it extends to Uganda and northwestern Tanganyika. S. Zimmermannianus grows in the highlands of northeastern Tanganyika. It must be rare on the Sigi. L.J.Brass, who visited the area, informs the writer that "Greenway himself did not seem to know of any species on the Sigi other than S. Courmonti. The Sigi is a short river rising in the Eastern Usambara Mts. and entering the sea a few miles north of Tanga. It is close to Amani, where Greenway lived, and he has done a lot of collecting on it."

STROPHANTHUS PREUSSII var. SCABRIDULUS Monachino, var. nov.

A varietate typica foliis subtus scabridulis recedit.

The leaves resemble those of S. gracilis, although the flowers are unmistakably those of typical S. Preussii. Leaves scabridulous beneath with many closely spaced, short, erect, sharp, stiff hairs. Hairs often also on petioles, sometimes on midrib above and elsewhere on the upper surface of the leaf. There are transitional states to the typical glabrous variety.

Type: P. T. L. Putman 118, Belgian Congo, "Epulu and vicinity, about 200 miles east of Stanleyville, 1935"; deposited at the Arnold Arboretum.

Many additional collections of this variety have been examined. They are from the Eastern Provinces of the Belgian Congo, districts of Stanleyville, Lova and Ituri (Bokuma, Epulu, Lubutu, Yambuya, Yangambi).

STROPHANTHUS PREUSSII var. SCABRIDULUS forma MULTINERVIS

Monachino, forma nov.

A forma typica nervis lateralibus numerosis 11--13-jugis plusminusve horizontalibus recedit.

Type: J. Louis 2865, Belgian Congo, "Yangambi, à 9 km. au N. du fleuve, 470 m. alt., lisière forêt primitive de plateau, 30 Nov. 1936"; deposited in the Jardin Botanique de l'Etat, Brussels.

STROPHANTHUS PREUSSII var. SCABRIDULUS forma PAUCINERVIS

Monachino, forma nov.

A forma typica nervis lateralibus praecipuis paucis 2--4-jugis ascendentibus recedit.

Type: J. Louis 4333, Belgian Congo, "Yangambi, à 7 km. au N.W. du Poste, ca. 470 m. alt., lisière forêt primitive de plateau, 5 July 1937"; deposited at the Jardin Botanique de l'Etat, Brussels.

STROPHANTHUS PREUSSII var. PREUSSII forma CREBRINERVIS

Monachino, forma nov.

A forma typica nervis lateralibus numerosis 11--13-jugis plusminusve horizontalibus recedit.

Type: J. Louis 1351, Belgian Congo, "Yalibwa, à 22 km. au N. de Yangambi, ca. 470 m. alt., sous-bois peuplement de Macrobium Dewevrei le long de la rivière Lubilaya, 23 Feb. 1936, petit liane ligneuse, fleurs jaunes, 'Yjojo' (dialecte Turumbu);" deposited at the Jardin Botanique de l'Etat, Brussels.

This form is a glabrous leaved counterpart of S. Preussii var. scabridulus forma multinervis. It has also been collected at Bipindi, French Cameroons.

STROPHANTHUS SARMENTOSUS var. GLABRIFLORUS Monachino, var. nov.

A varietate typica floribus simul foliis expositis terminalibus paucis, sepalis corollaque extus glabris, et sepalis 5--10 mm. longis recedit.

Type: H. Pobeguïn 1288, French Guinea, "environs de Kindia, commun en bord de la ona-ona, 1905, n'est pas le S. sarmentosus pousse toujours au bord de l'eau et moins grim pant, fruit genre sarmentosus mais plus court, bout arrondi"; deposited at the Muséum d'Histoire Naturelle, Paris.

A photograph of the type appears in the Journal of the New York Botanical Garden 51 (610): 239. October 1950.

All the characters used to typify this variety are abundantly variable in the species. The taxon is proposed chiefly to designate an extreme.

Two additional collections are known from French Guinea.

Franchet examined type material of S. laurifolius and wrote that the flowers are puberulent outside. The species belongs with S. sarmentosus and its two varieties and consequently is involved in the varietal synonymy of S. sarmentosus.

STROPHANTHUS SINGAPORIANUS var. SINGAPORIANUS forma HIRTELLUS

Monachino, forma nov.

A forma typica foliis inflorescentiisque hirtellis recedit.

Type: J. Motley 760, Borneo, "Bangarmassig, 1857-8"; deposited at the Royal Botanic Gardens, Kew.

Other variations, such as glabrous or slightly pilose ovary in S. caudatus, large leaved, long petioled forms in S. Welwitschii, etc., have been observed, but the material available does not warrant any publication of even formae in these species.

Herbarium specimens demonstrate that all the species of Strophanthus having a wide distributional range are quite polymorphic. The species of limited range or habitat are probably

genetically likewise polymorphic, though this is less obvious from the poor representation of herbarium sheets. Morphological distinctions have been observed associated with geography and ecology, but most of these differences, highly dubious in the field, fail in the herbarium. Of special interest is the statement made by R. D. Meikle (2 & 4) regarding the different forms of S. sarmentosus in Northern and Southern Nigeria. The savanna form of the arid northern portion of the colony has smaller leaves and flowers, smaller more pointed follicles, and slimmer more gray and hairy seeds, in contrast to the stouter, chocolate colored seeds of the forest form of the south. Intermediate forms occur. Meikle adds that plants from seed germinated at Kew have retained the larger or smaller leaves of the parent plants. However trivial such variations may be from the taxonomic viewpoint, the great chemical differences, for instance in the sarmentogenin yield of the seeds (in S. sarmentosus a difference of about 100 times the amount in some samples), have a tremendous economic importance. This variation in chemical constituents, like that in morphology, is not definitive. R. K. Callow (2) points out that there are extremes in sarverogenin and sarmentogenin contents, with intermediates. Reichstein suggests that his MPD.50 is heterogeneous, not identical with the original Munch seeds from which sarmentogenin was first named. He also informs the writer that he already has found a better yielder. Further field studies like those of Brass, Meikle, Chevalier, and Schnell, and breeding work which has not yet been seriously begun, will cast light on a deeply significant problem. On the chemical aspect, studies are in progress. Naturally, it is not always feasible to identify specimens by the classical method of extraction, which requires at least 50 grams of seeds. Reichstein (5) has drawn comparisons between closely related forms by use of paper chromatography. The possibility of the use of histological technique to distinguish minor forms of the species needs study.

Fourteen species and 4 varieties of Strophanthus have been hitherto described since Gilg's monograph in 1903. Half of these are spurious. Five species are represented by one or two collections only. Four of these rare plants grow in the Belgian Congo. Here over half of the 30 known continental African species are found. The Belgian Congo would therefore appear to be the most likely region for the future discovery of novelties.

R. W. J. Keay noted regarding his collection 16012 from Oyo, Nigeria, "Commonly called S. sarmentosus A. P. DC. but differing from the high forest form. Note smaller flowers and leaves, the pointed fruit and plane of dehiscence. 13/10/49." The writer has seen other specimens of the small flowered, small leaved form, collected in Senegal, French Sudan, and also in Northern Nigeria (Katsina, Omwudinjoh 22369). Seeds of S. sarmentosus from Katsina have yielded sarmentogenin (2). Callow

(1) reports that the Emir of Katsina instructed district and village heads to organize collection of "Kwankwani" and 10,500 pods of S. sarmentosus were collected within 4 days. Keay has sent seeds of an Oyo plant to Perck and Co., but results of chemical tests are not yet known.

The savanna specimens having character combinations of small flowers and leaves and sarmentogeniferous seeds may be worth a formal infraspecific name, for the sake of convenience if hardly for taxonomic purpose alone. This will often require field knowledge of the plant population and chemical tests of the seeds. Selection of a name for these chiefly chemical variants from previously published varieties and forms will be difficult and ambiguous. P. DeCandolle's typical variety of S. sarmentosus was from Sierra Leone. Sarmentogeniferous seeds of the species have been collected in Sierra Leone (2). But there are many examples of large flowered specimens from the same colony. It thus seems unwise to select the typical variety as the sarmentogeniferous kind, in which case a selection of name would have to be made for the forest variety. There is also uncertainty attached to S. sarmentosus var. pendulus (Kumm. & Hook.) Pax. S. sarmentosus var. major Dewèvre is a forest plant, while var. pubescens Staner & Michotte and forma Paroissei (Franch.) A. Chevalier are based on mixtures. Franchet wrote that the corolla-tube of S. laurifolius is 15 mm. long; there are two varieties of this species, S. laurifolius var. verticillatus P. DC. and var. oppositifolius P. DC. The species belongs with S. sarmentosus, and if it is adjudged a variety of typical S. sarmentosus, the varietal names become available. The illustration of S. sarmentosus forma senegambiae (A. DC.) A. Chevalier looks like the slender fruited, small leaved kind discussed above; only field work will clarify how it differs from S. laurifolius, which was probably also collected in Senegambia. The chemistry of the seeds is unknown. Reichsteir's "Strophanthus spec. var. sarmentogenifera No LPD 50" has no botanical standing; it was not meant to be a formal publication of a taxon.

Summary: Few distinctive taxonomic novelties are to be expected in Strophanthus. The Belgian Congo appears the most likely place for their discovery. One new species, S. Zimmermannianus, very closely allied with S. Preussii, two minor varieties, and two forms are described. Some varieties or forms, possibly characterized by weakly morphological features, are extremely different chemically and thus of great economic significance. Field study is necessary to ascertain the taxonomy of these variants.

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THE SEED CHARACTER OF CHRYSOPHYLLUM BEARDII Monach.

Joseph V. Monachino

When Chrysophyllum Beardii was originally described (Phytologia 3: 159. 1949) it was stated that an important matter left to be desired for understanding the species was the fruit with ripe seeds. Through the constant surveillance of Mr. R. S. Ayliffe, who had previously collected the type of the species and two other numbers, this desideratum has now become available.

Seeds, germinated seeds, and a fruit of C. Beardii (cit. no. Monachino 527A, deposited at the New York Botanical Garden) were collected by Mr. Ayliffe on July 26, 1951, from underneath a tree near the 23 1/2 mile post on the Long Stretch. Although the material was collected from underneath the tree its

abundance left no doubt as to the parent. The tree corresponds to the specimen cited in my original article as Monachino 527, and the collector informs me that the present locality is the correct one, not that previously given. Mr. Aylliffe further informs me that the species fruits in May--June, but one cannot be sure yet. He expressed his fear that the other tree (the type?) has now been felled, as he failed to find it after repeated search.

It was early suspected that C. Beardii belonged in the section Pradosia, but the present seed collection, which shows the endosperm lacking and the radicle punctiform, now proves it. The fruit is obovoid, small, ca. 16 mm. long, 10 mm. across, short-stalked at base, mucronate by the persistent base of the style at apex, pubescent on surface. The seed is single, 13--14 mm. long, 8.5--9 mm. wide, 7.5--8 mm. thick; shell thin, shining, pale brown, the scar dull, 12--13 mm. long, 3.5--4 mm. broad; endosperm lacking; embryo carnose, finely white-streaked (latex vessels?), easily emitting long rubbery threads, the cotyledons elliptic-oblong, plano-convex, ca. 10 mm. long, 6 mm. wide, 5 mm. thick, the radicle punctiform-conic, ca. 1.2 mm. long, 1.5 mm. across at base. The seedling is with distinct hypocotyl, the leaves conduplicate in vernation, the margins and midrib, as well as the young stem, are strigose with pale brown hairs.

I have now borrowed J. S. Beard 341 from the Arnold Arboretum. It is a flowering plant of C. Beardii. The collection data read as follows: "Long Stretch Reserve, dominant in marsh forest, alt. 30 meters, 25 August 1944. Tree 25 m. high, 60 cm. diam. breast high, reddish bark peeling off in round flakes, the thin latex smelling of liquorice."

Regarding the existence of C. Beardii in British Guiana, Mr. D. B. Fanshawe, who was shown the species in Trinidad by Dr. Beard, informs me: "I am sure in my own mind that our 'swamp kakarua' is this species. I checked the small fragment in our herbarium with your description and they tallied and certainly the trees Dr. Beard showed me were the dead spit of 'swamp kakarua.' I have been on the look out for material of it myself for ages but so far failed."

I have recently examined two collections of the species, one with very immature flowers and the other sterile, made in November 1944 by Julian A. Steyermark in Venezuela (Ptari-tepuí, Bolívar). The leaves are coriaceous, much thicker than in the available Trinidad material of C. Beardii, often 3-verticillate, the lateral nerves somewhat closer, and the indumentum is more persistent.

The distribution of the species in continental South America, its variation, and its precise relationship with C. cochlearium still remain to be studied. The recognition of Pradosia

as a subgroup under either Chrysophyllum or Pouteria, or as a distinct genus, will continue to be a matter of personal inclination for a considerable time in the future.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE
VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND
ERIOCAULACEAE, SUPPLEMENT 7, AND MISCELLANEOUS TAXONOMIC NOTES

Harold N. Moldenke

Since the preparation of the sixth supplement to this list, to be published in the proceedings of the fourth centenary celebration of the founding of the Universidad Nacional Autónoma de México, several thousand additional specimens of these groups have been studied, chiefly from the Herbarium Bogoriense at Buitenzorg, the herbarium of the Chicago Natural History Museum, the herbarium of the University of Michigan, the herbarium of the Facultad de Agronomía del Valle [Colombia], the Botanisch Museum en Herbarium at Utrecht, the British Museum (Natural History) at London, the Melbourne Botanic Garden, and the Britton Herbarium of the New York Botanical Garden. This material has brought to light 72 new country or island records and 48 new state, province, or department records, and has revealed the necessity for certain emendations of previously published records. Eight new taxonomic entities are here proposed and described.

MEXICO:

Lantana glandulosissima Hayek [Durango]

Lantana velutina Mart. & Gal. [Durango]

CUBA:

Callicarpa cubensis var. parvifolia Moldenke [Pinar del Rio]*

COLOMBIA:

Aegiphila filipes Mart. & Schau. [Cauca]

Aegiphila guianensis Moldenke [Valle del Cauca]

Aegiphila lehmannii Moldenke [Valle del Cauca]

Aegiphila puberulenta Moldenke [Méta]

Citharexylum kunthianum Moldenke [Nariño]

Cornutia odorata var. colombiana Moldenke [Valle del Cauca]

Lantana armata Schau. [Boyacá]

Lantana boyacana Moldenke [Putumayo]

Lantana cujabensis Schau. [Valle del Cauca]

Lantana glandulosissima Hayek [Boyacá & Huila]

Lantana moritziana Otto & Dietr. [Caldas]

Lantana trifolia f. hirsuta Moldenke [Antioquia & Cauca]

Lantana trifolia f. oppositifolia Moldenke [Santander]

Lippia origanoides H.B.K. [Mariffo]

Paepalanthus columbiensis Ruhl. [Boyacá]

Paepalanthus ensifolius (H.B.K.) Kunth [Huila]

Paepalanthus fasciculatus (Rottb.) Körn. [Cundinamarca]

Paepalanthus karstenii Ruhl. [Santander del Norte]

Paepalanthus pilosus (H.B.K.) Kunth [Cauca]

ECUADOR:

Duranta triacantha A. L. Juss. [Tunguragua]

PERU:

Aegiphila cuneata var. hirsutissima Moldenke [Loreto]*

Castelia cuneato-ovata Cav. [Ica]

Verbena occulta Moldenke [Cajamarca]

ARGENTINA:

Verbena hookeriana (Covas & Schnack) Moldenke [Chubut]

PORTUGUESE EAST AFRICA:

Vitex patula E. A. Bruce [Mozambique]

UNION OF SOUTH AFRICA:

Vitex patula E. A. Bruce [Transvaal]

INDIA:

Vitex peduncularis Wall. [Sikkim]

BURMA:

Vitex glabrata R. Br. [Upper Burma]

ANDAMAN ISLANDS:

Vitex urceolata C. B. Clarke [South Andaman]

CHINA:

Vitex canescens Kurz [Kwangtung]

Vitex henryi Moldenke [Yunnan]*

Vitex quinata var. puberula (H. J. Lam) Moldenke [Kwangsi]

FORMOSA:

Vitex quinata var. puberula (H. J. Lam) Moldenke

HAINAN ISLAND:

Vitex pierreana Dop -- delete the asterisk

Vitex quinata var. puberula (H. J. Lam) Moldenke

FRENCH INDOCHINA:

Eriocaulon brownianum Mart. [Laos]

Eriocaulon gracile Mart. [Laos]

Eriocaulon hookerianum Stapf [Tonkin]

Eriocaulon sexangulare L. [Laos]

Vitex glabrata var. bombacifolia (Wall.) Moldenke [Cambodia]

Vitex quinata var. puberula (H. J. Lam) Moldenke [Annam & Tonkin]

Vitex vestita Wall. [Laos]

FEDERATED MALAY STATES:

Vitex millsii M. R. Henderson -- to be deleted

- Vitex vestita Wall. [Johore, Negri Sembilan, & Pahang]
Vitex vestita f. millsii (Henderson) Moldenke [Pahang]*

PHILIPPINE ISLANDS:

- Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Mindanao]
Vitex parviflora var. puberulenta [Luzon]*
Vitex quinata (Lour.) F. N. Will. [Batan]
Vitex quinata var. puberula (H. J. Lam) Moldenke [Leyte & Masbate]

CAROLINE ISLANDS:

- Vitex cofassus var. puberula H. J. Lam [Corol]
Vitex quinata (Lour.) F. N. Will. -- to be deleted
Vitex quinata var. puberula (H. J. Lam) Moldenke [Pelew Islands]

LINGGA ARCHIPELAGO:

- Vitex vestita Wall. [Lingga]

NIAS ISLAND:

- Vitex pinnata L.

SUMATRA:

- Vitex altissima var. alata (Willd.) Moldenke
Vitex quinata var. puberula (H. J. Lam) Moldenke
Vitex vestita f. glabrescens Moldenke*
Vitex vestita f. winkleri Moldenke

JAVA:

- Vitex altissima var. alata (Willd.) Moldenke
Vitex celebica Koord. -- to be deleted
Vitex cofassus Reinw.
Vitex quinata var. puberula (H. J. Lam) Moldenke

BRITISH NORTH BORNEO:

- Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.
Vitex quinata var. puberula (H. J. Lam) Moldenke
Vitex vestita f. winkleri Moldenke

BORNEO:

- Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.
Vitex glabrata R. Br.
Vitex quinata var. puberula (H. J. Lam) Moldenke
Vitex vestita f. winkleri Moldenke

CELEBES:

- Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm.
Vitex celebica Koord. -- to be deleted
Vitex cofassus f. anomala Moldenke
Vitex minahassae Koord. -- to be deleted
Vitex quinata var. puberula (H. J. Lam) Moldenke

MOENA ISLAND:

- Vitex cofassus Reinw.
Vitex quinata (Lour.) F. N. Will.

KANGEAN ARCHIPELAGO:

Vitex glabrata R. Br. [Eteng & Kangean]

LESSER SUNDA ISLANDS:

Vitex cofassus Reinw. [Buton]

Vitex glabrata R. Br. [Bali]

Vitex vestita Wall. [Muntok & Timor]

MOLUCCA ISLANDS:

Vitex cofassus Reinw. [Amboina, Buru, Mangole, Morotai, Sana-na, Sula, & Soelabesi]

Vitex cofassus f. anomala Moldenke [Buru]

Vitex glabrata R. Br. [Mangole & Tanimber Islands]

Vitex quinata var. puberula (H. J. Lam) Moldenke [Batjan, Buru, Halmahera, Morotai, Obi, & Soelabesi]

NEW GUINEA:

Vitex cofassus var. puberula H. J. Lam -- delete the asterisk

Vitex quinata var. puberula (H. J. Lam) Moldenke [Dutch New Guinea]

AROE ISLANDS:

Vitex cofassus Reinw.

Vitex quinata var. puberula (H. J. Lam) Moldenke [Oedjir]

HAWAIIAN ISLANDS:

Vitex parviflora A. L. Juss. [Oahu]

BISMARCK ARCHIPELAGO:

Vitex cofassus var. puberula H. J. Lam [New Ireland]

FIJI ISLANDS:

Vitex quinata (Lour.) F. N. Will. -- to be deleted

Vitex quinata var. puberula (H. J. Lam) Moldenke [Viti Levu]

CULTIVATED:

Lippia alba (Mill.) N. E. Br. [Colombia]

Vitex altissima L. f. [Java]

Vitex cofassus f. anomala Moldenke [Java]

Vitex glabrata R. Br. [Java]

Vitex quinata var. puberula (H. J. Lam) Moldenke [Java]

Vitex vestita Wall. [Java]

CALLICARPA CUBENSIS var. PARVIFLORA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum multo parvioribus angustioribusque.

This variety differs from the typical form of the species in having its leaf-blades much smaller and narrower, 1.2--2.7 cm. long and 5--10 mm. wide when mature.

The type of the variety was collected by my good friends and colleagues, Dr. Julian B. Acuña y Galés and Dr. Juan T. Roig (no. 16765), at La Cajalbana, La Palma, Pinar del Río, Cuba, on

March 8, 1951, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX COFASSUS f. *ANOMALA* Moldenke, f. nov.

Haec forma a forma typica speciei recedit foliis saepe 2-vel 3-foliolatis, 2- vel 3-partitis, vel 2- vel 3-lobatis.

This form differs from the typical form of the species in having many of its leaves 2- or 3-foliolate, 2- or 3-parted, or 2- or 3-lobed even at maturity on flowering specimens.

The type of the form is Boschproefstation BB.8579, collected at Tanaberoe, altitude about 5 m., Boeloekoemba, Celebes, on January 12, 1935, and is deposited in the herbarium of the Botanisch Museum at Utrecht.

VITEX HENRYI Moldenke, sp. nov.

Arbor; ramulis tetragonis minute puberulis; foliis 3- vel 5-foliolatis; petiolis petiolulisque minute puberulis; laminis firme chartaceis brunnescentibus ellipticis vel oblanceolato-obovatis longe acuminatis vel caudatis integris ad basim acutis utrinque glabratibus; inflorescentiis terminalibus paniculatis multifloris dense puberulis; calyce campanulato dense puberulento minute 5-apiculato.

Tree, 6--10 m. tall; branchlets slender, tetragonal, often somewhat compressed, minutely puberulent, brownish; nodes not plainly annulate; uppermost internodes about 5 cm. long; leaves decussate-opposite, 3- or 5-foliolate; petioles slender, 5--11.5 cm. long, very minutely puberulent; petiolules slender, the outermost 2--3 mm. long, the inner ones to 3.3 cm. long, very minutely puberulent or subglabrescent in age, flattened above; leaflet-blades firmly chartaceous, brunnescent in drying, elliptic or oblanceolate-obovate, 7--23 cm. long, 2.5--8.5 cm. wide, long-acuminate or caudate at the apex, entire, acute and sometimes slightly asymmetric at the base, practically glabrous on both surfaces; midrib very slightly prominulous above or plane, prominent beneath; secondaries slender, 9--12 per side, arcuate-ascending, plane or very slightly subimpressed above, sharply prominent beneath, indistinctly anastomosing at the margins; veinlet reticulation rather abundant, slightly subimpressed above, prominulous beneath; inflorescence terminal, paniculate, 15--35 cm. long, 7--19 cm. wide, composed of 5--9 many-flowered branches, the lowermost pair axillary in the axils of the uppermost leaves; rachis and inflorescence-branches tetragonal, usually sulcate, minutely but densely puberulent, nigrescent; pedicels very slender, 1--3 mm. long, densely puberulent; bracts, bractlets, and prophylla absent or caducous; calyx campanulate, 2--3 mm. long and wide, densely puberulent, its rim subtruncate, minutely 5-apiculate; corolla hypocrateriform, its tube 4--5 mm. long, densely short-pubescent outside with yellowish hairs, its limb about 6 mm. wide, the lobes

blunt, densely yellowish short-pubescent on the back; stamens short-exserted; fruiting-calyx incrassate, patelliform, 6--7 mm. wide, 5-lobed, striate-veined, lightly and obscurely puberulent on the outside, the lobes 1--1.5 mm. long, rounded; fruit drupaceous, fleshy, subglobose, to about 7 mm. long and wide when dried, wrinkled, glabrous.

The type of this species was collected by Augustin Henry (no. 12638) at Szemeo, Yunnan, China, before the year 1901, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX PARVIFLORA var. *PUBERULENTA* Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum subtus in costa et venis secundariis dense puberulis et inflorescentiisque dense flavescenti-pubescentibus.

This variety differs from the typical form of the species in having the leaflets decidedly puberulent on the midrib and secondaries beneath and the inflorescence densely flavescenti-pubescent throughout.

The type of the variety was collected by L. Mangubat [Herb. Philipp. Bur. Sci. 1361] at Mendez Nufez in the province of Cavite, Luzon, Philippine Islands, in August, 1906, and is deposited in the Herbarium Bogoriense at Buitenzorg.

VITEX QUINATA var. *PUBERULA* (H. J. Lam) Moldenke, comb. nov.

Vitex heterophylla var. *puberula* H. J. Lam, Verbenac. Malay Arch. 189 [as "(Miq.) H. J. Lam" in error]. 1919.

VITEX VESTITA f. *GLABRESCENS* Moldenke, f. nov.

Haec forma a forma typica speciei recedit laminis foliorum subtus petiolisque ramulisque inflorescentiisque glabris vel subglabrescentibus.

This form differs from the typical form of the species in having the lower leaf-surfaces, petioles, branchlets, and inflorescences glabrous or subglabrescent.

The type of the form was collected by Rahmat Si Toroes (no. 4698) along the Aek Roppak, near Hoeta Imbaroe (topographic sheet 41, northwest quarter), subdivision Padang Lawas, division Padang Si Dimpoean, Tapianoei, Sumatra, between June 22 and 30, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX VESTITA f. *MILLSII* (Henderson) Moldenke, comb. nov.

Vitex millsii Henderson, Journ. Asiat. Soc. Malaya 5: 262. 1927.

VITEX VESTITA f. *WINKLERI* Moldenke, f. nov.

Haec forma a forma typica speciei recedit laminis foliorum

subtus petiolisque ramulisque inflorescentisque parce puberulis.

This form differs from the typical form of the species in having its lower leaf-surfaces, petioles, branchlets, and inflorescences merely finely puberulous.

The type of the form was collected by Hubert Winkler (no. 2433) -- in whose honor it is named -- in southeastern Borneo on June 13, 1908, and is sheet no. 25401 in the Herbarium Bogorensis at Buitenzorg.

DR. GLEASON RETIRES

It is with deep regret that we announce the retirement of Dr. Henry A. Gleason as co-editor of PHYTOLOGIA. It was Dr. Gleason who, in the autumn of 1933, when all the leading botanical journals of the country were not only many months, but in some cases several years behind in the publication of papers accepted by their editorial committees, conceived the idea of a new journal to expedite botanical publication. With the assistance of the present writer, Dr. Gleason made all the necessary preliminary arrangements with Edwards Brothers, in Ann Arbor, Michigan, for the publication of a journal by the then quite new photo-offset process. The present writer suggested the name, PHYTOLOGIA, to indicate that the pages of the journal would be open to papers on all phases of plant science, and the first number was issued on December 4 of that year. This number consisted of botanical contributions by N. L. Britton, H. A. Gleason, E. P. Killip, C. V. Morton, A. C. Smith, and the present writer.

From that time on, and up to May, 1951, Dr. Gleason remained the very efficient co-editor and co-publisher of our journal, actively publicizing its advantages to botanists, aiding in increasing the subscription list, giving copious advice and help in editorial matters, and contributing frequent scientific papers.

We are extremely sorry that because of his retirement from the staff of the New York Botanical Garden, where he served so long and well, Dr. Gleason has felt it necessary to resign from so many of his other official positions and activities as well. We wish for him still many years of a rich, full life, and we look forward to many botanical contributions to our pages from him in the years to come.

H. N. Moldenke

ADDITIONAL NOTES ON THE ERIOCAULACEAE. VII

Harold N. Moldenke

Abbreviations for the names of herbaria used in this series of notes in addition to those listed in previous numbers (I, III, IV, V) and in my booklet entitled "A list showing the location of the principal collections of Verbenaceae and Avicenniaceae" (1942) and my booklet entitled "A list showing the location of the principal collections of Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae. Supplement 1" (1947) are as follows: Ak = Alan Hancock Foundation, University of Southern California, Los Angeles, California; Be = Instituto Agronomico do Norte, Belém, Pará, Brazil; Bh = Instituto Agronomico do Servico Publica de Estado, Belo Horizonte, Minas Geraes, Brazil; Bj = B. J. Bayer herbarium, Jamaica, New York; Bv = Bureau of Plant Industry Station, Beltsville, Maryland; Bz = Herbarium Bogoriense, Buitenzorg, Java, Indonesia; Cz = Canal Zone Biological Area, Barro Colorado Island, Balboa, Canal Zone, Panama; En = J. Ewan herbarium, New Orleans, Louisiana; Er = Palynologiska Laboratoriet, Bromma, Sweden; Ew = Erik Wall herbarium, Stockholm, Sweden; Fo = Instituto Botanico della Universita, Florence, Italy; Fy = University of Arkansas, Fayetteville, Arkansas; Ho = R. A. Howard herbarium, Cambridge, Massachusetts; Hv = Academia de Ciencias, Havana, Cuba; Jn = Aage Bohus-Jensen herbarium, Lyngbye, Denmark; Ku = Eberhard Kausel herbarium, Santiago, Chile; Li = Colegio Salesiano, Lima, Peru; Lw = University of Kansas, Lawrence, Kansas; Mb = Melbourne Botanic Garden, Melbourne, Victoria, Australia; Mh = Matuda Herbarium, Instituto Biologico, Escuintla, Chiapas, Mexico; Mk = Frank C. MacKeever herbarium, Mount Vernon, New York; Pc = Philip Cheitman herbarium, New York City; Pi = Polytechnic Institute of Puerto Rico, San Germán, Puerto Rico; Pn = Parque Nacional da Serra dos Orgãos, Terezopolis, Brazil; Qu = H. Flecker herbarium, Cairns, Queensland, Australia; Rb = Colegio Anchieta, Porto Alegre, Rio Grande do Sul, Brazil; Rl = Herbario Ruiz Leal, Codoy Cruz, Mendoza, Argentina; Sc = Colegio Notra Señora de la Caridad, Santiago de Cuba; Sf = Servico Florestal do Estado, São Paulo, Brazil; Ss = Science Service, Department of Agriculture, Ottawa, Ontario, Canada; Sw = J. Otis Swift herbarium, New York City; Tj = University of Santo Domingo, Ciudad Trujillo, Dominican Republic; Tl = Tulane University, New Orleans, Louisiana; To = United States Field Station, Sacaton, Arizona; and Vl = Facultad de Agronomia del Valle, Valle del Cauca, Colombia. I am grateful to the curators of these herbaria for affording me the opportunity of studying and annotating their material of this group.

LACHNOCAULON ANCEPS (Walt.) Morong

Additional citations: GEORGIA: Candler Co.: Pyron & McVaugh 688 (Gu--12632). Charlton Co.: Leeds 1288 (D--700884); Pyron & McVaugh 1497 (Gu--13934). Clay Co.: D. E. Eyles 7190 (Gu--28864). Douglas Co.: Cronquist 5424 (Gu--30340). Jeff Davis Co.: E. E. Barker s.n. [Spring, 1922] (Gu). Macon Co.: Pyron & McVaugh 498 (Gu--13106). Rabun Co.: W. H. Duncan 6614 (Gu). Richmond Co.: Cuthbert s.n. [Augusta, May 1881] (Fl--5423); W. H. Duncan 3470 (N). Screven Co.: J. M. Reade E.8370 (Gu). Taylor Co.: Pyron & McVaugh 2805 (Gu--16785). Ware Co.: W. M. Frye s.n. [Waycross, Aug. 13, 1937] (We); F. Harper 259 (D--718636). County undetermined: E. Brendel s.n. [1865] (Ur). FLORIDA: Alachua Co.: Arnold s.n. [Waldo, 7/9/31] (Fl--5438); Arnold & West s.n. [Gainesville, 12 May 1939] (Fl--5429); G. F. Weber s.n. [Fairbanks, 4-22-28] (Fl--5428, Fl--5430). Baker Co.: MacDaniels s.n. [Glen St. Mary, April 13, 1936] (Ba). Bay Co.: Banker 3582 (N). Bradford Co.: West & Arnold s.n. [Hampton, 15 May 1940] (Fl--32123). Clay Co.: W. M. Canby s.n. [Hibernia, 1869] (Cm, Pa, Pr); Leeds 1289 (D--700883). Collier Co.: W. P. Porter s.n. [Naples, July 15, 1937] (Fl--30490). Duval Co.: Curtiss 3021 (Cm, Du--254174, Or--2204), 4139 (Du--90818, Es), 4861 (Al, Es), 6201 (Fl--5433), s.n. [near Jacksonville] (Cm); Fredholm 104 (Po--119236); Lighthipe 173 (Ob--23921), s.n. [So. Jacksonville, April 13, '97] (Ur, Ur). Escambia Co.: E. Brainerd s.n. [March 18, 1907] (Vt). Franklin Co.: Saurman s.n. [Apalachicola, 1867] (Pa), s.n. [Apalachicola] (Pr). Hillsborough Co.: Britton, Britton, & Shafer 109 (Cm); A. P. Garber s.n. [Tampa, Sept. 1877] (Vt). Lake Co.: A. S. Hitchcock 10872 (Po--186159), s.n. [Eustis, June & July 1894] (Fl--5435, Ka); Nash 1942 (Es, Fl--5424); W. H. Welch 1601 (Dp--2927, N). Leon Co.: A. Wood s.n. [Tallahassee] (Pa). Manatee Co.: Cuthbert 1331 (Fl--5421, Fl--5443), 1606 (Fl--5422), s.n. [Bradenton, June 19, 1916] (Fl--5444), s.n. [Pradenton, 15 June 1919] (Fl--5426, Fl--5427); Tracy 7586 (Cm, Es). Marion Co.: Wisdale s.n. [Silver Springs, 19 April 1936] (Fl--12084). Orange Co.: O'Neill s.n. [Bithlo, June 17, 1929] (Fl--5425); Watson & Murrill s.n. [Windermere, 6/12/40] (N). Osceola Co.: Singletary s.n. [Kissimmee, Feb. 29, 1936] (H--46211); W. H. Welch 1514 (Dp--2926). Pasco Co.: McFarlin 5347 (Gg--242790); O'Neill 7786, in part (Cm, Du--271017, Gg--276710, H--57919, Mb, N). Polk Co.: O. E. Jennings s.n. [Fort Meade, late Dec. 1919] (Cm); McFarlin 4043 (Au). Putnam Co.: Laessle s.n. [Welaka, 5/3/40] (Fl--18699); West & Arnold s.n. [East Palatka, 7 June 1940] (N). Saint Johns Co.: C. Skottsberg s.n. [13.5.1935] (Go); West & Arnold s.n. [St.

Augustine, 7 June 1940] (N). Volusia Co.: E. Brainerd s.n. [March 28, 1909] (Vt); Dowell 7351 (Mb, N), 7380 (Mb, N). County undetermined: H. C. Beardslee s.n. [Wagner, 2-13-32] (Ob-94491); A. W. Chapman s.n. [Florida] (Ms, Pa, Pr, Pr); A. Gray s.n. (Br); Herb. Univ. Vermont s.n. (Vt); Stuhr s.n. [Florida, 1925] (Or-35346); West & Arnold 18 [Pinkosons Springs] (Fl-5442). ALABAMA: Mobile Co.: Jewett s.n. [Mobile, May 9, 1839] (Ur); Mackenzie 4059 (Dm); C. T. Mohr s.n. [April 1871] (Du-90819), s.n. [Mobile, 1878] (Pr), s.n. [Mobile] (Po-181953). MISSISSIPPI: Harrison Co.: Langlois s.n. [Pass Christian, 26 June 1885] (Pa). Jackson Co.: Skehan 22542 (Ur); Tracy 5031 (Dm). LOUISIANA: Natchitoches Par.: Correll & Correll 9785 (H-71751). Orleans Par.: C. Hartmann 1837 (Du). Saint Tammany Par.: Bomhard s.n. [Slidell, Apr. 25, 1929] (Cm). TEXAS: Hardin Co.: Warner s.n. [Kountze, 4/21/39] (Hu). Jasper Co.: Parks & Cory 22180 (Tr); Whitehouse s.n. [6/10/1931] (Au, Au, N). Jefferson Co.: Hooks s.n. [5/30/34] (Au), s.n. [6/7/36] (Au). Liberty Co.: Sanders & Sanders s.n. [near Romayor, 12 May 1940] (Mi). Newton Co.: Tharp 44346 (Au, N). Tyler Co.: Tharp 44343 (Au, N). County undetermined: M. C. Leavenworth s.n. (D-781695). LOCALITY OF COLLECTION UNDESIGNATED: A. W. Chapman s.n. [Southern Flora] (Pr); Herb. Chapman s.n. [Southern Flora] (Ms); Herb. Prager 2178-343 (Gg--105732).

LACHNOCAULON BEYRICHIANUM Sporleder

Additional citations: FLORIDA: Saint Johns Co.: M. C. Reynolds s.n. [Saint Augustine, Mar.-June 1875] (Pr).

LACHNOCAULON DIGYNUM Körn.

Dr. Roland M. Harper, in a letter to me dated October 29, 1948, states that there is a specimen in the herbarium of the Missouri Botanical Garden collected by himself in Charlton Co., Georgia, in 1902, labeled as L. digynum without any question, probably on the advice of the late Dr. J. K. Small. Dr. Small, however, fails to record the species from Georgia.

L. digynum has always been regarded as a valid species by all who have worked on it, with the exception of Bentham and Hooker, who, however, were not experts on the group. Monographers who have had the most experience with the group all regard it as a valid species. Körnicke in Linnaea 27: 570 (1854) states that the type specimen was collected in "Alabama", no further locality designated, and was sent by Bentham to him. The original type is in the Vienna herbarium -- possibly destroyed during the past war.

Britton in Bull. Torrey Bot. Club 19: 362 (1891) says of it: "I have not seen specimens of this. Körnicke attributes it to Alabama, from whence it was sent by Bentham. It differs, accord-

ing to Körnicke, from all the preceding species in having a two-celled ovary, two appendices, a two-parted style and bifid stigmas. It is regarded well developed, but it appears to me to come much closer to L. Beyrichianum. Fresh specimens are very desirable."

Ruhland, who next monographed the family after Körnicke, in Engler, *Das Pflanzenreich* 13 (4-30): 242 (1903), lists L. digy-num as his species no. 4, the last one in the genus, right after L. anceps, and gives its distribution as "Nord-Amerika: Alabama (Hb. Vindob., mis. Bentham)". He cites no other material.

In North American Flora 19: 48--49 (1937) I place the species as no. 6 in the genus, between L. beyrichianum and L. cubense, and give its distribution as "Sandy soil, often in pine-lands, Mississippi, Alabama, and Florida." In the New York Botanical Garden herbarium there are only two specimens of the species: (1) Pennell 4474 from moist sandy pineland along Rabbit Creek, Theodore, Mobile Co., Alabama, collected September 1, 1912, and (2) Lloyd & Tracy 318 from Mississippi City, Harrison Co., Mississippi, collected September 6, 1900.

Additional citations: ALABAMA: Mobile Co.: F. W. Pennell 4474 (D--631941).

LACHNOCAULON ECILIATUM Small

Additional citations: FLORIDA: Walton Co.: Curtiss 3022 (Pa--isotype).

LACHNOCAULON EKMANNII Ruhl.

Additional citations: CUBA: Pinar del Río: Carabia 748 (Cr, N), 749 (Cr), 750 (Cr); Ekman 18132 (Ha).

LACHNOCAULON ENGLERI Ruhl.

Specimens of this species have been identified in herbaria as L. floridanum, L. glabrum, L. beyrichianum, L. anceps, Eriocaulon pumilum Chapm., E. eleocharoides Chapm., E. ravenelii Chapm., and Trypethelium mastoideum Ach. The Chapman specimen cited below is marked "TYPE" and bears on its label both the names Eriocaulon pumilum and E. eleocharoides.

The species has been collected in anthesis in April, June, July, August, and December.

Additional citations: FLORIDA: Bay Co.: Stipe 73 (Gu--28393). Highlands Co.: Phillips & Buswell s.n. [April 9, 1939] (Bu). Lake Co.: Bright 4715 (Cm), 4716 (Dm); Nash 1184 (Es--isotype), 1293 (Es), 1295 (D--824291), 1825a (Es). Orange Co.: O'Neill s.n. [Lake Oia, July 2, 1929] (Fl--5431). Osceola Co.: M. F. Baker s.n. [Aug. 13, 1935] (Bu, Fl--403, Ob--94492). Pasco Co.: O'Neill 7785a (Gg--276661, N). Polk Co.: J. R. Pennell s.n.

[Frostproof, Dec. 5, 1927] (D--637460). Putnam Co.: E. West s. n. [Keystone Heights, 18 July 1937] (Fl--26980). County undetermined: Collector undesignated s.n. (Pr). LOCALITY OF COLLECTION UNDESIGNATED: A. W. Chapman s.n. (D--783988).

LACHNOCAULON FLORIDANUM Small

Additional citations: FLORIDA: Lake Co.: Nash 1981 (Es--isotype).

LACHNOCAULON GLABRUM Körn.

Numerous specimens of this species have been identified and distributed in herbaria as L. floridanum, Eriocaulon gnaphalodes Michx., or "E. ravenellii Chapm.", while the Standley specimen cited below was originally identified as E. septangulare With., then changed to E. lineare Small by Jones in 1943!

The species inhabits pinelands, palmetto hammocks, and sandridges, and has been collected in anthesis in June.

Additional citations: FLORIDA: Collier Co.: Dr. Cooper s.n. [Everglades, 1839] (Ms). Duval Co.: Curtiss 6201, in part (D--824292). Indian River Co.: J. K. Small 8838 (N). Lee Co.: Buswell s.n. [May 3, 1932] (Bu); A. S. Hitchcock s.n. [Myers, July Aug. 1900] (Ka); J. P. Standley 33 (Ur), 498 (Ba, Cm, Or--13410, Po--173099, Se--3909, Ur, Ur, Vi--15411). Levy Co.: A. P. Garber s.n. [Oct. 1877] (Pa). Manatee Co.: Rothrock s.n. [March 22, 1887] (D--824290, Pa). Okeechobee Co.: Small, Britton, Britton, & DeWinkeler 9261 (N). Palm Beach Co.: Muenscher & Muenscher 14057 (N). LOCALITY OF COLLECTION UNDESIGNATED: A. W. Chapman s.n. (Pr).

LACHNOCAULON MINUS (Chapm.) Small

Literature references: A. C. Martin, Am. Midl. Nat. 36: 533, pl. 4. 1946.

Herbarium material of this species has been distributed as L. anceps and "Paepalanthus flavidulis" in addition to the names previously recorded. It has been collected in anthesis in every month from March to November, inclusive, and in fruit in July and August. It inhabits low or wet places, wet lake-shores, low pinelands, damp pine barrens, wet sand pockets, moist sandy soil, open pinelands, the margins of ponds in dry woods, and dry sterile white sand beneath Pinus palustris and Quercus virginiana.

The endosperm morphology is discussed by Martin in the reference given above. The Canby specimen listed below looks very much like L. eciliatum. The Wiegand 7785 specimens cited below match fairly well some material cited under L. anceps; the heads on some of the peduncles are to 6 mm. broad and the peduncles to 40 cm. long. The Pl. Exsicc. Gray. 926 material cited

here also is anomalous -- its heads are rather light-colored, but are small in size as in this species. Many other specimens of this number have been cited by me as L. anceps, of which this collection may well be a depauperate form, or it may represent a hybrid between the two species.

Additional citations: NORTH CAROLINA: Bladen Co.: Buell & West 1742 (Gg--290778). Brunswick Co.: Blomquist 5742 (H-399). New Hanover Co.: W. M. Canby s.n. [prope Wilmington, Oct. 1867] (Pa); R. K. Godfrey s.n. [Pl. Exsicc. Gray. 926], in part (Au, Ba, Gg--275556, Ms, N, N); MacElwee s.n. [Wilmington, 7/95] (D-518033). Onslow Co.: Randolph & Randolph 977 (Ba). SOUTH CAROLINA: Jasper Co.: Wiegand & Manning 688 (Po--216759). GEORGIA: Chatham Co.: D. E. Eyles 6088 (Gu--28395). County undetermined: Beyrich s.n. [in Georgia Amer. sept.] (Gg). FLORIDA: Columbia Co.: W. H. Welch 1682 (Dp--2928). Duval Co.: Curtiss 6201 (Ur); H. A. Lang s.n. [Hogan, Aug. 13, 1909] (D--538004). Gadsden Co.: A. Wood s.n. [Quincy] (Pa). Gilchrist Co.: West & Arnold s.n. [Trenton, 5 Oct. 1940] (N). Highlands Co.: P. O. Schallert s.n. [7-29-40] (Bt--58010). Hillsborough Co.: A. P. Garber s.n. [Tampa, Sept. 1877] (D--824289, in part). Lake Co.: A. S. Hitchcock s.n. [Eustis, June & July 1894] (Fl--5434, Ka); Nash 148 (D--703935, Es), 1295 (D--824291, Es), 1855 (Es). Leon Co.: A. Wood s.n. [Tallahassee] (Pa). Nassau Co.: P. O. Schallert s.n. [5/4/41] (N). Orange Co.: H. C. Beardslee s.n. [Winter Park, May 1919] (Ob--94494). Pasco Co.: O'Neill 7785 (Gg--290777, N), 7786, in part (Ba); Wiegand 7785 (Au, Au). Polk Co.: P. O. Schallert s.n. [4/30/41] (Dp--30192, N). Putnam Co.: J. H. Barnhart 2117 [Herb. Barnhart 2563] (N). Seminole Co.: H. C. Beardslee s.n. [Nov. 7, 1938] (Ob--94493). Volusia Co.: Curtiss 6894 (Ka, Ur); Noble s.n. [Lake Helen, 1905] (Po--267592). Walton Co.: Curtiss 5911 (Al, Du--90820, Fl--5432, Ka, Ur).

LEIOTHRIX ARECHAVALETAE Ruhl.

Literature: Herter, Florula 44. 1930.

The species grows in marshy places on dunes, in the littoral association, wet sand at the edge of swamps, swampy places along sandy beaches, and especially in wet depressions between dunes. It has been found in the bafados of Pando and Carrasco, in the Parque Plata and along the banks of the Río La Plata. It has been collected in anthesis in January, February, October, and December, at altitudes of 3--4 m. above sea level. Herter describes the species as 1--2 dm. tall, with pale-brown and cream flowers. It has been mis-identified as "Paepalanthus arechavaletae Ruhl." by Lombardo.

Additional citations: URUGUAY: Herter 1774b [Herb. Herter 99363] (N); Lombardo 3436 (N); Moldenke & Moldenke 19695 (Es, N,

Ot, Sm); Osten 6409 (Go, N, N--photo, W--1175615, Z--photo); Rosengurtt B.1103 (N).

LEIOTHRIX ARGENTEA Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 533 (N--photo of isotype, Vi--12424--isotype, Z--photo of isotype).

LEIOTHRIX ARRECTA Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2511 [Herb. Jard. Bot. Belo Horiz. 7885] (N).

LEIOTHRIX BECKII (Szyscz.) Ruhl.

Synonym: Lophophyllum itatiaiae Körn. ex V. A. Pouls., Vidensk. Meddel Kjøbenhavn 1888: 350. 1888.

Additional citations: BRAZIL: Minas Geraes: Glaziou 6741 [Macbride photos 22283] (Kr--photo, N). Rio de Janeiro: Brade & Santos Lima 11699 [Herb. Rio de Janeiro 26710] (Ja).

LEIOTHRIX CRASSIFOLIA (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Silveira 337 (Vi--12423).

LEIOTHRIX CURVIFOLIA (Bong.) Ruhl.

A synonym under which material of this species is often found in herbaria is Eriocaulon calocephalum Bong.

Additional citations: BRAZIL: Minas Geraes: Martius 893 (T); Silveira 339 (Vi--12426).

LEIOTHRIX CURVIFOLIA var. LANUGINOSA (Bong.) Ruhl.

Material of this variety is often found in herbaria under the names L. lanuginosa (Bong.) Ruhl. and Paepalanthus lanuginosa Körn.

Additional citations: BRAZIL: Minas Geraes: Berla s.n. [Herb. Rio de Janeiro 37345] (Ja, N); L. Riedel 1038 (M); Silveira 338 (Vi--12421).

LEIOTHRIX CURVIFOLIA var. PLANTAGO (Mart.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2570 [Herb. Jard. Bot. Belo Horiz. 8246] (N). State undetermined: G. Gardner 5277 (N).

LEIOTHRIX CURVIFOLIA var. SETACEA Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 4334 [Herb. Jard. Bot. Belo Horiz. 45163] (N); Mexia 5799 (Gg--286187); Sampaio 6707 [Herb. Rio de Janeiro 47646] (Ja, N); Ule 2722 [Herb. Rio de Janeiro 47751] (Ja, N).

LEIOTHRIX DISTICHOCLADA Herzog

The species is recorded by Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923) from Serra Marsalina, in central Bahia, where it is said to be typical of the carrasco.

LEIOTHRIX DISTICHOCLADA f. BRACTEATA Herzog

This form is recorded by Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923) from Bom Jesus do Rio de Contas and Serra do Pinheiro, in central Bahia, where it is said to be typical of the carrasco.

LEIOTHRIX DISTICHOCLADA var. GLANDULOSA Herzog

This variety is recorded (as f. glandulosa) by Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923) from Serra das Almas, alt. 1700 m., in central Bahia, where it is said to be typical of the carrasco.

LEIOTHRIX ECHINOCEPHALA Ruhl.

Additional citations: BRAZIL: Minas Geraes: Silveira 209 (Vi—12428).

LEIOTHRIX EDWALLII Alv. Silv.

This species appears as "Paepalanthus Edwallii Alv. Silv." in Silveira's Floralia Montium, page 282 (1928), where, however, it is listed as a species (no. 6) under the genus Leiothrix and where reference is made to the earlier Flora e Serras Minas, page 70 (1908).

LEIOTHRIX FLAVESCENS (Bong.) Ruhl.

The species is recorded by Luetzelburg, Estudo Botanico do Nordeste 3: 148 (1923) from (1) Bom Jesus do Rio de Contas, central Bahia, (2) Serra de Itubira, central Bahia, (3) Ventania, Paraná, and (4) Gávea, alt. 800 m., Rio de Janeiro. He says that it is typical of the carrasco. It has been mis-identified in some herbaria as Paepalanthus elongatus var. pubescens Alv. Silv. Hochreutiner identified Martius 896 as "Paepalanthus sp." It has been found at altitudes of from 1025 to 2000 m., in anthesis in July and September.

Additional citations: VENEZUELA: Amazonas: Steyermark 58252 (N). Bolívar: G. H. H. Tate 1109 (Ve—18472). BRAZIL: Alagoas: G. Gardner s.n. (M). Minas Geraes: P. Clausen 1 (N); Mello Barreto 9487 [Herb. Jard. Bot. Belo Horiz. 25678] (N); Mendes Magalhães 2538 [Herb. Jard. Bot. Belo Horiz. 43813] (N), 4349 [Herb. Jard. Bot. Belo Horiz. 45201] (N); Silveira 210 (Vi—15836). São Paulo: Brade 12225 (Ja—30345), 12229 (Ja—30341); Guillemín 521 (N, N, N, N, N); W. Hoehne 765 (N, Wh, Wh); Moldenke & Moldenke 19639 (Es, F, Lg, Mg, Mr, N, N, No, Ot, S, Sm), 19641 (Es, Lg, N, Sm), 19904 (N), 19910 (Es, N, No), 19911 (Es,

Lg, Mg, N, Ot, Sm). State undetermined: Guillemin 239 (N, N);
Martius 896 (T). BOLIVIA: El Beni: R. S. Williams 1487 (N).

LEIOTHRIX FULGIDA Ruhl.

The collection cited below was determined by Standley as Syngonanthus gracilis (Körn.) Ruhl. and will be found under that name in many herbaria.

Additional citations: BRAZIL: Minas Geraes: Mexia 5882 (Gg—286192, N).

LEIOTHRIX GOMESII Alv. Silv.

According to Silveira in Floralia Montium, page 289 (1928), a synonym is L. hirsuta var. magalhãesii Alv. Silv.

LEIOTHRIX HIRSUTA (Wikstr.) Ruhl.

This species is recorded by Luetzelburg, Estud. Bot. do Nordeste 3: 147 & 150 (1923) from Bom Jesus do Rio de Contas and Lamós in central Bahia, where it is said to be typical of the carrasco.

Additional citations: BRAZIL: Federal District: Brade 10983 (Ja—26709, N). Rio de Janeiro: Zehntner 272 (Ja—47723).

LEIOTHRIX HIRSUTA var. BLANCHETIANA (Körn.) Ruhl.

Additional citations: BRAZIL: Bahia: Blanchet 2598 (T—iso-type).

LEIOTHRIX LONGIPES Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 2421 [Herb. Jard. Bot. Belo Horiz. 43528] (ML, N).

LEIOTHRIX LUXURIANS (Körn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 2540 [Herb. Jard. Bot. Belo Horiz. 43818] (N).

LEIOTHRIX NUBIGENA (Kunth) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Silveira 527 (Vi—12422).

LEIOTHRIX PILULIFERA (Körn.) Ruhl.

Additional citations: BRAZIL: Alagoas: G. Gardner 1429 (N). Pernambuco: Pickel 3165 (Gg—276711, N).

LEIOTHRIX RUFULA (A. St. Hil.) Ruhl.

Synonym: Trichocalyx rufulus Kunth ex V. A. Poul., Vidensk. Meddel. Kjøbenhavn 1888: 353. 1888.

Material of this species is often found in herbaria under the name of Eriocaulon trinianum Mart.

Additional citations: BRAZIL: Rio de Janeiro: Martius 550

(T); L. Riedel s.n. (M).

LEIOTHRIX STEYERMARKII Moldenke

Additional citations: VENEZUELA: Bolívar: Steyermark 59779 (F--1205140--type, ML--photo of type, N--isotype, N--photo of type, Si--photo of type, Z--photo of type).

LEIOTHRIX TINGUENSIS Herzog

This species is recorded by Luetzelburg, Estud. Bot. do Nordeste 3: 148 (1923) from Serra de Tinguá, alt. 700 m., Bahia, where it is said to be typical of the carrasco.

LEIOTHRIX TURBINATA Gleason

This species has been collected at 1700--1980 m. altitude on Cerro Duida.

Additional citations: VENEZUELA: Amazonas: Steyermark 58180 (F--1205137).

LEIOTHRIX UMBRATILIS Moldenke

Additional citations: VENEZUELA: Bolívar: Lasser 1733 (N); Phelps & Hitchcock 380 (N); Steyermark 60280 (N--type).

LEIOTHRIX VIVIPARA (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2513 [Herb. Jard. Bot. Belo Horiz. 8281] (N), 9445 [Herb. Jard. Bot. Belo Horiz. 24636] (N); Mexia 5781 (Gg--286184); L. Riedel 582 (M--isotype).

MESANTHEMUM AFRICANUM Moldenke

Additional citations: SOUTHERN RHODESIA: F. W. J. McCosh 2 [Govt. Herb. Salisbury 17692] (K, Rh). PORTUGUESE EAST AFRICA: Gazaland: Munch 72 [Govt. Herb. Salisbury 20996] (N--type, Rh--isotype). Mozambique: W. H. Johnson 243 (K).

MESANTHEMUM PRESCOTTIANUM (Bong.) Körn.

Additional citations: IVORY COAST: Scaetta 3098 [139] (An, An, F--photo, N, N--photo, Sg--photo, Z--photo).

MESANTHEMUM RADICANS Körn.

Additional citations: ANGOLA: Kongo: Gossweiler 9153 (F--photo, N, N--photo, Sg--photo, W--1373590, Z--photo).

MESANTHEMUM RUTENBERGIANUM Körn.

Terrac in Trav. Lab. Mat. Med. 33 (3): 107 (1947) reports that this species -- under the synonymous name M. platyphyllum Baker -- is employed medicinally by natives in the areas where it grows. They take the leaves cooked with rice during their pregnancy in order to avoid any accidents during the period of

their lying-in. This decoction is also employed as a sedative,^{RS} astringent in cases of diarrhea, and as an aromatic.

Additional citations: MADAGASCAR: Hildebrandt 3714 (F—photo, N, N—photo, Sg—photo, W—808234, Z—photo).

PAEPALANTHUS Mart.

Original publication: Mart., Nova Acta Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): 13. 1835.

Synonyms: Dupatya Vell., Fl. Flum. 35. 1825 [nomen rejiciendum]. Stephanophyllum Guill. in Deless., Icon. Sel. 3: 61, pl. 98, in obs. 1837. Cladocaulon G. Gardn. in Hook., Icon. Pl. pl. 528. 1843. Limnoxeranthemum Salzm. ex Steud., Syn. Pl. Cyp. 2: 281, in syn. 1855. — I regard Lasiolepis Böck. as a generic synonym of Eriocaulon, instead of placing it as synonymous "in part" with Eriocaulon and "in part" with Paepalanthus, as Ruhland does. In the original publication, Flora 56: 90--91 (1873) — not "41" as stated in some works — three species are described, but none is designated as the type species. These 3 species are: 1. L. brevifolia, 2. L. pilosa, and 3. L. aquatica. L. brevifolia is synonymous with Eriocaulon lasiolepis Ruhl., L. pilosa with Paepalanthus lamarckii, and L. aquatica with Eriocaulon melanocephalum. In cases such as this it is the common practice to regard the first-described species as the type species. Following this practice here, Lasiolepis becomes a synonym of Eriocaulon, not of Paepalanthus.

Literature: Massart & al., Mission Biol. Belge au Brésil 1922-23, 1: fig. 392. 1929; F. C. Hoehne, Bot. e Agr. Bras. Sec. XVI: 52--53 & 345. 1937; H. P. Veloso, Memorias de Instituto Oswaldo Cruz 46 (1): 109, fig. 8. 1948.

The illustration in the Veloso publication cited above shows a 6-foot tall specimen of an unidentified species of Paepalanthus.

PAEPALANTHUS ACANTHOPHYLLUS Ruhl.

The species is recorded by Luetzelburg, Estudo Botanico do Nordeste 3: 148 (1923) from Serra de Ituhita in central Bahia, where he says it is typical of the carrasco and constitutes 10 percent of the total vegetation!

Additional citations: BRAZIL: Goyaz: Glaziou 22323 (N—iso-type).

PAEPALANTHUS ACUMINATUS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Magalhaes s.n. [Herb. Silveira 240] (Vi—15831—istotype).

PAEPALANTHUS AEQUALIS (Vell.) J. F. Macbr.

The Gardner collection cited below is cited by Ruhland under the synonymous name of P. blepharocnemis Mart.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5267 (N). São Paulo: Brade 5530 [Herb. Inst. Bot. S. Paulo 6584] (N), 12230 (Ja—30340).

PAEPALANTHUS ALBO-TOMENTOSUS Herzog

The species is recorded by Luetzelberg, Estudo Botanico do Nordeste 3: 148 (1923) from Alto Rio Bromado, Alto Rio de Contas, and Serra das Almas, alt. 1800 m., all in central Bahia, where it is said to be typical of the carrasco and frequent in the brejo.

PAEPALANTHUS ALBO-VAGINATUS Alv. Silv.

Additional citations: BRAZIL: Paraná: Hatschbach 997 (N), 1461 (N).

PAEPALANTHUS ALPINUS Körn.

The species is described by Balls as having stiff upright "stems" to 10 inches tall, basal rosettes of spear-shaped leaves to 8 inches across, and gray-white flowers in dense round heads to 1 inch across. It inhabits moist or boggy soil on open sunny slopes, altitude 3300—3500 m., blooming in December and March. The young leaves of the Killip collection cited below are very hairy.

Additional citations: COLOMBIA: Boyacá: Linden 1310 (Br— isotype, N—fragment of isotype, N—photo of isotype, Z—photo of isotype), s.n. [Tunja, Mars 1843] (Br). Cundinamarca: Balls 5759 (W—1777707); Garcia Barriga 1610 (W—1851737); Killip 34120 (N).

PAEPALANTHUS ALSINOIDES C. Wright

Literature reference: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 114. 1946.

The species grows in white siliceous sand on savannas. It has been collected in anthesis, in addition to the months previously reported, in May and November.

Additional citations: CUBA: Pinar del Río: Acuña 10975 (Es); Carabia 745 (Cr, N), 747 (Cr, N), 3868 (Cr, N); Ekman 17918 [Herb. Roig 2834] (Es), x (Ha), s.n. [Herb. Est. Cent. Agron. 8310] (Es); León & Alain 17797 (N); León, Victorin, & Alain 17797 (N); Moldenke & Moldenke 19881 (Es, F, Lg, Mg, Mr, N, No, Ot, S, Sm); Moldenke, Moldenke, León, Alain, & Acuña 15268 (Es, Es); C. Wright 3743 (Pa— isotype).

PAEPALANTHUS ALSINOIDES var. MINIMUS Jennings

Literature: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47. 1947.

This diminutive variety inhabits sandy soil and is endemic to the Isle of Pines and western Cuba.

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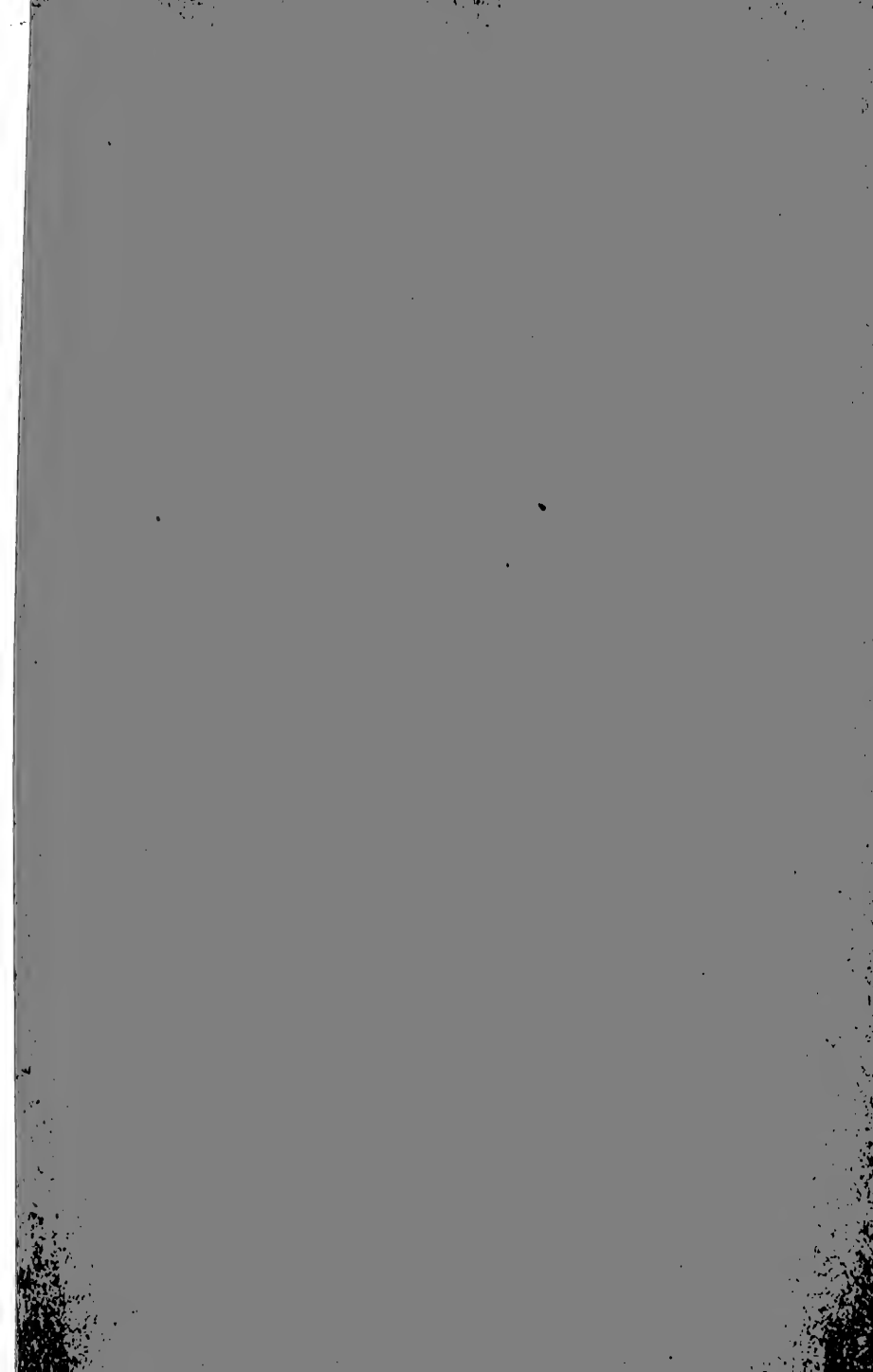
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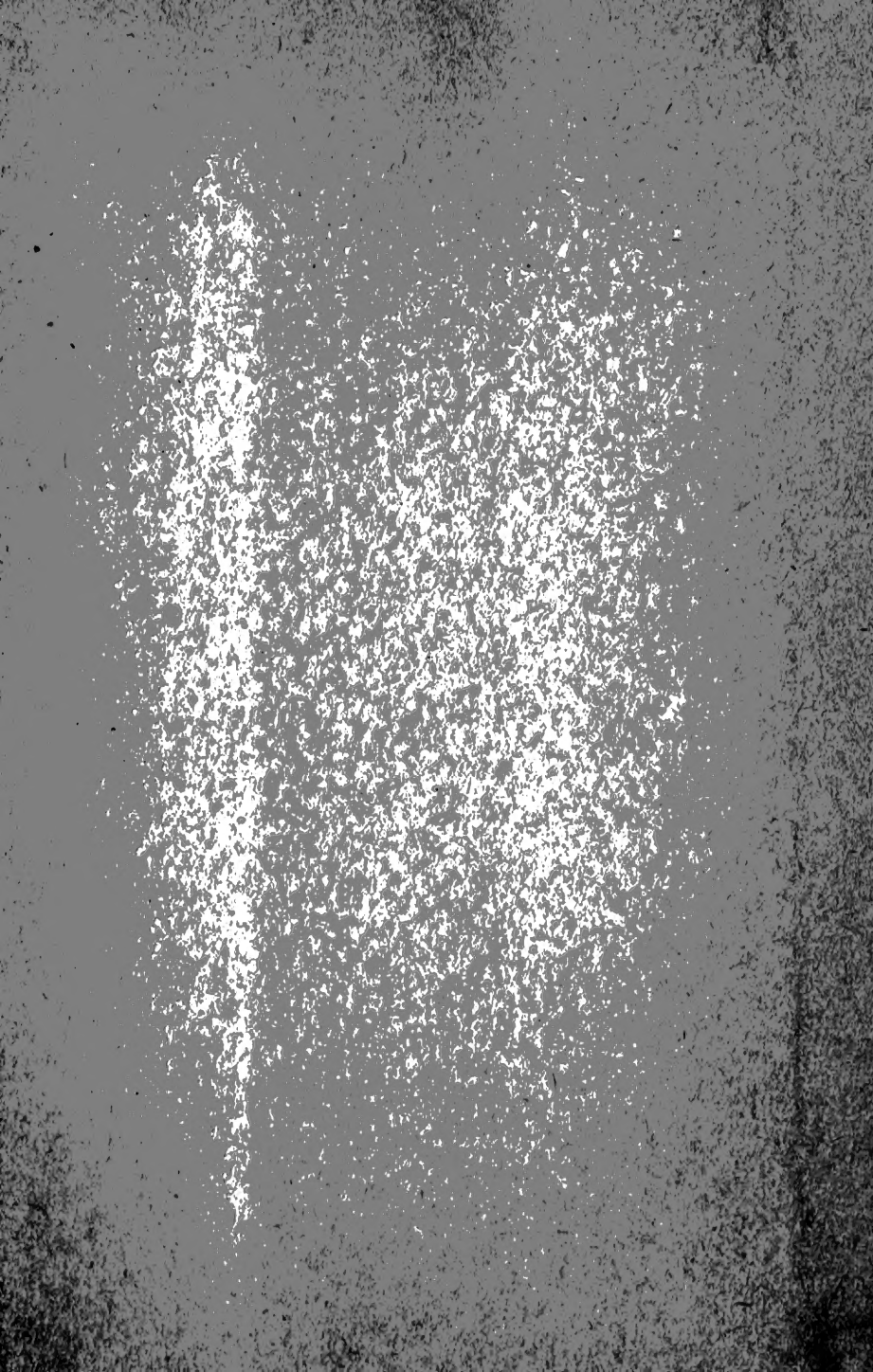
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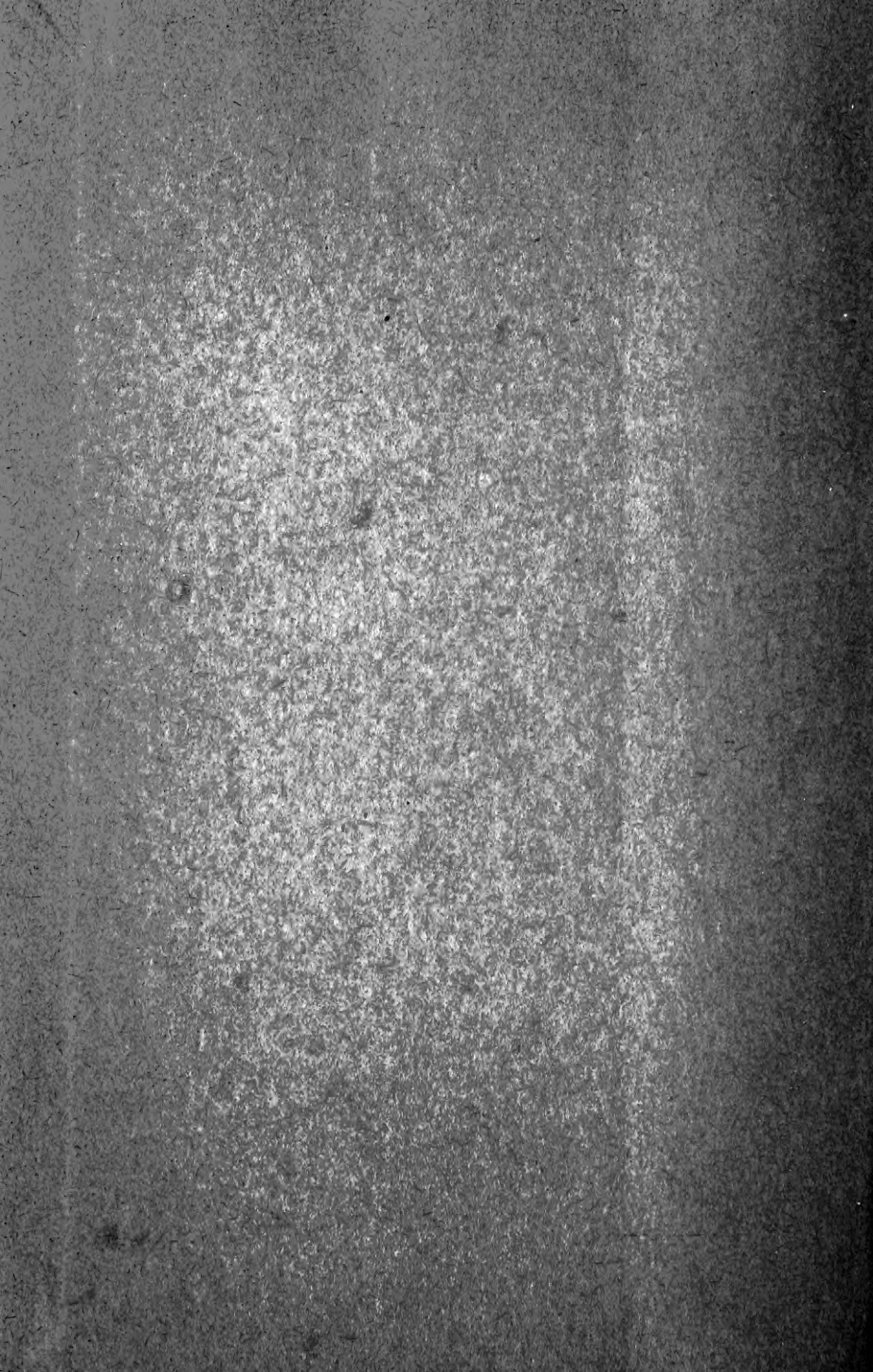
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