LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

580.5
FB
v.28
no.1-2

BIOLOGY

JUL 22 1960

The person charging this material is responsible for its return to the library from which it was withdrawn on or before the **Latest Date** stamped below.

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.

To renew call Telephone Center, 333-8400

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

MAY 06 1984

L161—O-1096

197

FIELDIANA: BOTANY

A Continuation of the

BOTANICAL SERIES

of

FIELD MUSEUM OF NATURAL HISTORY

VOLUME 28
NUMBERS 1 AND 2

CHICAGO NATURAL HISTORY MUSEUM
CHICAGO, U.S.A.
1951–1952

FB
v.28
no.1-2

CONTENTS

BOTANICAL EXPLORATION IN VENEZUELA—I, II

By Julian A. Steyermark and Collaborators.

PAGES

Number 1. From Musci through Sarraceniaceae 1–242

Number 2. From Droseraceae through Umbelliferae 243–447

LIST OF ILLUSTRATIONS

TEXT FIGURES

NUMBER 1

		PAGE
1.	*Paspalum aureolatum*	23
2.	*Paspalum piligerum*	25
3.	*Arthrostylidium Steyermarkii*	32
4.	*Myriocladus virgatus*	35
5.	Achenes of *Bulbostylis Svensoniana, Fimbristylis tamaensis, Rhynchospora dentinux, R. sanariapensis, R. tepuiana, R. Trichochaeta* var. *venezuelensis, R. Trichochaeta, R. bolivarana, R. karuaiana*	38
6.	*Rhynchospora ptaritepuiana, R. culmenicola, R. paramora, R. tamana, R. tomentosa, Hypolytrum tepuianum, Exochogyne Steyermarkii*	42
7.	*Carex roraimensis, C. culmenicola, C. turumiquirensis, Uncinia meridensis*	62
8.	*Vesicarex collumanthus, Carex larensis, C. tachirensis*	64
9.	*Bactris duidae*	74
10.	*Bactris ptariana*	79
11.	*Dahlgrenia ptariana*	83
12.	*Anthurium ptarianum*	95
13.	*Philodendron duidae*	97
14.	*Philonotion Williamsii*	100
15.	*Urospatha savannarum*	103
16.	*Xyris albescens, X. esmeraldae, X. lanulobractea, X. ptariana, X. stenostachya*	106
		106
17.	*Stegolepis ptaritepuiana, S. Gleasoniana, S. parvipetala*	132
18.	*Brocchinia melanacra*	136
19.	*Brocchinia Steyermarkii, B. vestita*	137
20.	*Connellia caricifolia, C. nutans*	140
21.	*Navia aurea, N. glauca, N. Steyermarkii, N. xyridiflora*	142
22.	*Guzmania confinis, Pitcairnia tuberculata, Tillandsia lacera*	144
23.	*Guzmania retusa, Pitcairnia cinerea, Tillandsia stenoglossa*	146
24.	*Burmannia sanariapoana*	166
25.	*Pogonia stricta*	168
26.	*Pogonia triflora*	170
27.	*Pogonia unifoliata*	172
28.	*Prescottia carnosa*	175

PAGE

29. *Erythrodes confusa* 176
30. *Stelis dispar* 179
31. *Lepanthes exilis* 181
32. *Pleurothallis callifera* 182
33. *Pleurothallis exilis, P. humilis* 184
34. *Pleurothallis Steyermarkii* 187
35. *Pleurothallis subtilis* 189
36. *Octomeria rhizomatosa* 191
37. *Acineta alticola* 193
38. *Maxillaria condensata* 195
39. *Maxillaria patula* 198
40. *Oncidium diffusum* 201
41. *Lockhartia latilabris* 202
42. *Euplassa venezuelana* 218
43. *Weinmannia roraimensis* 248

NUMBER 2

44. *Weinmannia Steyermarkii* 250
45. *Swartzia parvifolia* 264
46. *Taralea rigida* 267
47. *Taralea Steyermarkii* 269
48. *Burdachia Duckei* 284
49. *Burdachia Williamsii* 286
50. *Glandonia Williamsii* 290
51. *Heteropterys quetepensis* 291
52. *Polygala appressa* var. *kavanayen* 297
53. *Polygala Blakeana* 299
54. *Polygala sanariapoana* 302
55. *Polygala santanderensis* 303
56. *Chaetocarpus Williamsii* 307
57A. *Croizatia neotropica* 310
57B–F. *Croizatia neotropica, Actephila dispersa* 311
58. *Phyllanthus majus* 319
59. *Ilex ptariana* 326
60. *Ilex ptariana* 327
61. *Ilex subrotundifolia* 329
62. *Ilex venezuelensis* 331
63. *Ilex vesparum* 333
64. *Maytenus apiculata* 335
65. *Maytenus coriacea* 336
66. *Maytenus Pittieriana* 339

PAGE

67. *Emmotum ptarianum* ... 342
68. *Cupania kukenanica* ... 345
69. *Cupania roraimae* ... 345
70. *Dipterodendron venezuelense* ... 348
71. *Matayba ptariana* ... 349
72. *Matayba reducta* ... 351
73. *Matayba sororopaniana* ... 352
74. *Quararibea Steyermarkii* ... 364
75. *Poecilandra pumila* ... 373
76. *Sauvagesia duidae* ... 375
77. *Sauvagesia longipes* ... 377
78. *Sauvagesia miniata* ... 379
79. *Clusia imbricata* ... 388
80. *Clusia pusilla* ... 389
81. *Mahurea sororopantepuiana* ... 396
82. *Tovomita angustata* ... 401
83. *Elatine Fassettiana* ... 402
84. *Cinnamodendron venezuelense* ... 405
85. *Viola venezuelensis* ... 408, 409
86. *Cajophora larensis* ... 413
87. *Cajophora venezuelensis* ... 415
88. *Begonia laxa* ... 416
89. *Begonia otophylla* ... 419
90. *Begonia sucrensis* ... 421
91. *Farringtonia fasciculata* ... 427
92. *Macrocentrum minus* ... 433
93. *Miconia larensis* ... 437
94. *Azorella Julianii* ... 446

JUN 9 1951

CONTRIBUTIONS TO THE FLORA OF VENEZUELA

JULIAN A. STEYERMARK

AND COLLABORATORS

FIELDIANA: BOTANY

VOLUME 28, NUMBER 1

Published by

CHICAGO NATURAL HISTORY MUSEUM

MAY 18, 1951

CONTRIBUTIONS TO
THE FLORA OF VENEZUELA

JULIAN A. STEYERMARK
Curator of the Herbarium

AND COLLABORATORS

FIELDIANA: BOTANY
VOLUME 28, NUMBER 1
Published by
CHICAGO NATURAL HISTORY MUSEUM
MAY 18, 1951

THE LIBRARY OF THE

PRINTED IN THE UNITED STATES OF AMERICA
BY CHICAGO NATURAL HISTORY MUSEUM PRESS

F13
v.281

BOTANICAL EXPLORATION IN VENEZUELA - I

From December, 1943, to September, 1944, the author explored portions of the Venezuelan Andes, Coastal Range (Cordillera de la Costa), Duida, and Roraima on behalf of the United States government as Senior Botanist under the auspices of the Foreign Economic Administration, in connection with the Cinchona survey of that country. From October to December, 1944, under the auspices of the Chicago Natural History Museum, he made a botanical exploration of Ptari-tepuí, Sororopán-tepuí, Carrao-tepuí, and mesa region of Santa Teresita de Kavanayén. From February to June, 1945, sponsored by the Ministerio de Agricultura y Cria and the Servicio Botanico at Caracas, he explored the eastern section of the Cordillera de la Costa in the states of Sucre, Anzoátegui, and Monagas, including the high peaks of Cerro Turumiquire.

The identification of these collections was started at the beginning of the year 1946, and has continued since. The total number of plants collected amounted to 8,550 numbers, divided as follows: Andes, 2,048; eastern part of the Cordillera de la Costa, in the states of Sucre, Anzoategui, and Monagas, 1,947; western and central part of the Cordillera de la Costa, 1,261; Ptari-tepuí, Sororopán-tepuí, and Carrao-tepuí, 1,644; Roraima and adjacent Gran Sabana, 841; Duida and adjacent Orinoco area, 809.

Apart from the numerous encountered species previously unrecorded for Venezuela, a very large number of species new to science, as well as a number of new genera, have been found. The present publication, therefore, is the first installment, to be followed in systematic order by succeeding ones, consisting of descriptions of all the new entities and new combinations made necessary as a result of the taxonomic studies. The last installment, which will follow the publication of all new species, will contain a comprehensive summary of the species collected in the various regions, with critical taxonomic and phytogeographical notes wherever necessary. This final summary of the flora will be published together with a more detailed account of the geology, topography, floral zones, and ecological aspects of Ptari-tepuí and surrounding area, and the surrounding area, and the eastern part of the Cordillera de la Costa in the states of Sucre, Anzoátegui, and Monagas, including Cerro Turumiquire, as well as some special notes on the ascent and vegetation of Duida and Roraima and adjacent areas explored.

For this final treatment the flora will be separated into the following regions (with the exception of the Algae, Mosses, and Podocarpaceae): (1) additions to the flora of Duida, (2) additions to the

flora of Roraima, (3) flora of Ptari-tepuí, and adjacent Sororopán-tepuí and Carrao-tepuí, which are extensions of Ptari-tepuí, (4) flora of Cerro Turumiquire and adjacent Oriente region, which includes the Cordillera de la Costa in the states of Sucre, Anzoátegui, and Monagas, and (5) miscellaneous species of the Andes of Venezuela in the states of Lara, Trujillo, Merida, and Tachira. The families of cryptogams and phanerogams (with the exception of Algae, Lichens, mosses, and Podocarpaceae) have been arranged in this order.

The style of treatment has been made to conform as much as possible with that found in the report by Gleason and collaborators on the "Botanical Results of the Tyler-Duida Expedition," published in The Bulletin of the Torrey Botanical Club 58: 277-506 (1931), and in that by Maguire and collaborators on "Plant Explorations in Guiana in 1944, Chiefly to the Tafelberg and the Kaieteur Plateau," in the same journal, 75: 56-115, 189-230, 286-323 (1948). In order to facilitate the assembling and correlation of data from Duida, the same subdivisions of "lowland species" and "species of Mount Duida" have been continued. In the present treatment "lowland species" refer to all collections made in the Territorio Federal Amazonas between Puerto Ayacucho and the base of Mount Duida by Steyermark, and those made along the Río Negro and Río Guainia by Mr. Llewelyn Williams, while "species of Mount Duida" include all those made on the slopes or summit of that cerro. As regards locality names the same ones have been followed as were used by Tate for Mount Roraima, by Tate and Hitchcock for Mount Duida, and by the Phelps expedition for Ptari-tepuí. This has been done mainly in order to conform to existing published locality names, in the interest of clarity. Mount Ptari-tepuí lies in the southeastern portion of Venezuela in the state of Bolívar, 130 kilometers northwest of Mount Roraima and 65 kilometers to the east of Mount Auyan-tepuí, and in $5^0\,45'$ N. Lat., $61^0\,45'$ W. Long. Its extensions include Sororopán-tepuí and Carrao-tepuí in the same latitude and longitude, all of them situated on that part of the mesa of the Gran Sabana in the vicinity of the Mission of Santa Teresita de Kavanayén. Ptari-tepuí and its extensions represent one of the "northernmost extensions of the Guiana highlands in the watersheds of the Caroní and Paragua rivers."[1]

The author is greatly indebted to the various collaborators for their contributions of the particular groups or families which they studied in connection with this report. To the curators of the New York Botanical Garden, Gray Herbarium, and United States National Herbarium the author is greatly indebted for the loan of critical material used in connection with the study of specimens.

Finally, I wish to express my deepest gratitude and appreciation to the many persons in Venezuela who have helped to facilitate my

[1]Zimmer, J. T. and Phelps, W. H., Am. Mus. Nov., no. 1270: 9. 1944, and no. 1274: 1-9. 1945.

botanical exploration made in that country: Dr. Henry Pittier, Dr. Tobias Lasser, Dr. L. Schnee, Capitan Felix Cardona P., and Zoraida Luces of the Servicio Botánico of the Ministerio de Agricultura y Cria, Caracas; Dr. V. M. López and associates of the Servicio Técnico de Minería y Geología of the Ministerio de Fomento, Caracas; Mr. William H. Phelps, Mr. William Phelps, Jr., and Mrs. Kathleen Phelps, of Caracas; Mr. Victor M. Badillo, of Caracas; Dr. Delbert Langham of the Ministerio de Agricultura y Cria, Maracay; Dr. James H. Kempton, American Embassy, Caracas; to the many officials of the Ministerio de Agricultura y Cria throughout Venezuela; Padre Victor de Carbajal and his staff at Santa Teresita de Kavanayén: members of the staff of Instituto Biblico "Las Delicias", at Caripe; officials of the Mene Grande Oil Company; to the governors and their subordinates in the states of Táchira, Mérida, Lara, Sucre, Anzoátegui, Monagas, Bolívar, and Territorio Federal Amazonas; Mr. Eulogio Mago of Cocollar; and Mr. Fernando Peña of Santa Elena. To the members of the staff of the Foreign Economic Administration of the American Embassy at Caracas, and to my associate of the Cinchona Mission, Dr. H. Arthur Meyer of the Department of Forestry, Pennsylvania State College, Pa., I wish to express my sincere thanks for their co-operation in facilitating the botanical surveys.

A complete set of specimens is deposited in the herbarium of the Chicago Natural History Museum. Unless otherwise indicated, the types of the new species are deposited in that institution. Also, unless otherwise stated, all numbers cited have been collected by the author.

The abbreviations used in citing specimens are as follows:

A - Arnold Arboretum
F - Chicago Natural History Museum (Field Museum)
G - Gray Herbarium
I - University of Illinois
MBG - Missouri Botanical Garden
NY - New York Botanical Garden
PH - Academy of Natural Sciences of Philadelphia
US - United States National Herbarium
Ven - Servicio Botanico, Caracas
YU - Yale University

MUSCI[2]

Campylopus (Eucampylopus) **bolivarensis** Bartr., sp. nov.

Robustus, laxe caespitosus, caespites nigricantes, superne lutescentes, nitidi. Caulis submersus, 6-10 cm. longus, simplex vel parce ramosus. Folia rigida, erecto-patentis, sicca immutata, 7-8 mm. longa, anguste ovato-lanceolata, tubuloso-concava, sensim setaceo-acuminata, saepe in pilum hyalinum parce denticulatum producta; costa excurrente; cellulae basilares anguste rectangulares, incrassatae, arcte porosae, marginales angustiores, alares numerosae, fuscescentes, cellulae superiores lineares. Caetera ignota.

Type in herb. Bartram, isotype in herb. Chi. Nat. Hist. Mus., collected on summit of Mount Roraima, on southern half of the summit between Summit Camp, Great Central Rift, Central Swamp, and pond at southern end, state of Bolívar, alt. 2700-2740 m., September 28, 1944, *Julian A. Steyermark 58895;* same locality, *Steyermark 58915.*

The submerged habit is a very unusual one for *Campylopus*, and the species appears to be sharply distinct. The strongly porose basal areolation and the linear upper leaf cells are characters in common shared by no other species of the *Eucampylopus* group that I am familiar with.

Didymodon angustifolius Bartr., sp. nov.

Caespites densi, inferne fusci, superne virides, ad 1 cm. alti. Folia humida late patentia, flexuosa, sicca arcte circínato-contorta, 3-4.5 cm. longa, e basi erecta, breviter oblonga, concava angustissime lineari-ligulata, subulato-acuminata; margines plani, integri; costa breviter excurrente; cellulae superiores rotundatae, incrassatae, diam. circa 8 m. papillosae, margines versus 2-3 stratosae, basilares rectangulares, tenerae, hyalinae. Caetera ignota.

Type in herb. Bartram, isotype in herb. Chi. Nat. Hist. Mus., collected on north-facing slopes above La Trinidad in cloud forest zone, southwest of Cocollar, Cerro Turumiquire, state of Sucre, alt. 2100-2200 m., May 5, 1945, *Julian A. Steyermark 62544.* MONAGAS: Guácharo Cave, 6 kms. northwest of Guácharo, alt. 950 m., *Steyermark 62293a.* ANZOÁTEGUI: cloud forest of fila Grande, headwaters of Quebrada La Tigra, Cerro San José, between Bergantín and Cerro Peonia (Cerro Los Pajaritos), alt. 1800-1850 m., *Steyermark 61550a.*

Without fruit the generic position of this species must remain uncertain. The long, exceedingly narrow, plane margined leaves with the upper cells in two or three layers toward the margins, together with the thin-walled rectangular cells of the leaf base is an unusual combination of characters comparable to no other species familiar to me. As the costa in cross section shows stereid bands on both

[2]By E. B. Bartram

sides of the median arc of guide cells, it seems logical to include the species in *Didymodon* rather than in *Trichostomopsis*.

Meteoriopsis remotifolia (Hornsch.) Broth. var. **robusta** Bartr., var. nov.

Caulis ad 20 cm. longus, dense et regulariter pinnatim ramosus. Folia ad 3 mm. longa, 1.3 mm. lata.

Type in herb. Bartram, isotype in herb. Chi. Nat. Hist. Mus., collected in cloud forest on wooded summit of Cerro Peonía (Cerro Los Pajaritos), above Santa Cruz, headwaters of Río Manantiales, east of Bergantín, state of Anzoátegui, alt. 2350 m., March 21, 1945, *Julian A. Steyermark 61683a.*

Superficially these plants bear little resemblance to the customary forms of *M. remotifolia* with slender, irregularly branched stems, but structurally the plants are identical. The densely set branches form a compact frond. This unusual habit in connection with the larger leaves distinguishes the new variety from any form of typical plants that have come under my observation.

Hookeriopsis Steyermarkii Bartr., sp. nov.

Caespites densi, sordide virides. Caulis ad 5-6 cm. longus, prostratus, irregulariter pinnatim ramosus. Folia erecto-patentia, 2 mm. longa, ovato-lanceolata, tenuiter acuminata, haud undulata, leviter concava; margines erecti, superne minute serrulati; nervis dorso laevibus, ultra medium evanidis; cellulae angustae lineares, laevissimae, infimae laxiores. Caetera ignota.

Type in herb. Bartram, isotype in herb. Chi. Nat. Hist. Mus., collected along base of east-facing high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2410-2450 m., Nov. 7, 1944, *Julian A. Steyermark 59942;* same locality, *Steyermark 59942a.*

These plants resemble *H. diffusa* (Wils.) Jaeg. in habit and appearance but differ widely in the slenderly acuminate leaves weakly toothed above, the linear lamina cells and the more slender costae, smooth on the back and ending well below the base of the leaf acumen.

Hookeriopsis ptari-tepuiensis Bartr., sp. nov.

Caespites depressi, densi, sordide virides. Caulis circa 4 cm. longus, subpinnatim ramosus. Folia erecto-patentia, 1.5 mm. longa, oblongo-lanceolata, plicata, breviter acuminata, haud undulata; margines erecti, inferne integri, superne serrati; nervis dorso laevibus, infra apicem evanidio, apice dorso prominulis; cellulae lineares, incrassatae, vermiculares, infimae laxiores. Caetera ignota.

Type in herb. Bartram, isotype in herb. Chi. Nat. His. Mus., collected on steep forested slopes at base of first line of sandstone bluffs, on south-facing part, west of "Cave Rock", Ptari-tepuí, state of Bolívar, alt. 2130 m., Nov. 4, 1944, *Julian A. Steyermark 59846.*

Compared with *H. Steyermarkii* the leaves here are of a different shape, more bluntly pointed, and coarsely serrate above and plicate, the costae are stouter, longer, and end in a minute prickle on the back. These distinctions are not impressive but definite and well maintained, so I feel convinced that *H. ptari-tepuiensis* will prove to be a valid species.

Lepidopilum Steyermarkii Bartr., sp. nov.

Dioicum? Gracile, lutescenti-viride. Caulis secundarius ad 2 cm. longus, laxe foliosus. Folia sicca contorta, humida patentia, laterialia asymmetrica, late ovata, abrupte breviter acuminata, superne remote denticulata; nervis infra medium evanidis; cellulis ovato-hexagonis, marginalibus 3-5 seriatis angustioribus, limbum distinctum efformantibus. Seta 3-3.5 mm. longa, superne grosse pappillosa, inferne parce scaberula vel laevis; theca inclinata, oblongo-ovato; operculum longe et tenuiter rostratum; calyptra (immatura) ramentis paucis praedita.

Type in herb. Bartram, isotype in herb. Chi. Nat. Hist. Mus., collected between Hacienda Agua Blanca above La Azulita and Río Capaz, state of Merída, alt. 975 m., April 26, 1944, *Julian A. Steyermark 56138.*

This species differs from *L. tortifolium* Mitt. in the broader more abruptly pointed leaves and shorter setae which are papillose above and nearly smooth below.

PTERIDOPHYTA[3]

CYATHEACEAE

Cyathea purpurea Morton, sp. nov.

Caudex 1.5 m. altus, 7.5 cm. diam.; folia ca. 1 m. longa; stipites inermes, ca. 55 cm. longi, medio ca. 7 mm. diam., atropurpurei, glabri, basi dense appresso-paleacei, paleis firmis, lanceolatis, longe attenuatis, brunneis, concoloribus, usque ad 20 mm. longis et 3 mm. latis, minute erosis; laminae ovatae, bipinnato-pinnatifidae, rhachi atropurpurea, supra incurvo-pilosa, subtus glabra, inermi, epaleacea; pinnae patentes (infimae deflexae), lanceolatae, usque ad 27 cm. longae et 12 mm. latae, breviter petiolulatae, acuminatae, rhachi purpurea, supra incurvo-pilosa, subtus glabra, epaleacea, pinnulis ca. 15-jugis, brevissime petiolulatis (1 mm.), lanceolatis, breviter acuminatis, maximis 6 cm. longis et 1.6 cm. latis, basalibus paullo reductis, alte pinnatifidis, costa supra substrigosa, ala costali ca. 0.5 mm. lata, segmentis 12-14-jugis, oblongis, 8-10 mm. longis, 2.8-3.3 mm. latis, crenulatis, utrinque glabris, in costulis subtus paleis pallidis, minutis, cucullatis, sparse onustis; venae 5-7-jugae, omnes basin versus furcatae; sori 3-5-jugi, in venae furcationem siti; indusia primo completum, mox irregulariter fissum, brunneum, glabrum; receptaculum magnum; paraphyses breves, numerosae.

Type in herb. Chi. Nat. Hist. Mus., nos. 1,204,683-4, collected between Agüita and summit of Cerro Duida, Territorio Federal Amazonas, alt. 1800 m., Sept. 5, 1944, *Julian A. Steyermark 58395;* isotype in U.S. Nat. Herb., no. 1,915,061.

The present species is characterized by its dark brown, rigid, concolorous rhizome and stipe scales, its unarmed stipe, glabrous segments, and especially by its dark purple, shining, scaleless rhachises and costae.

Alsophila demissa Morton, sp. nov.

Caudex erectus, verisimiliter parvus gracilisque, paleis brunneis, concoloribus, ovatis, 5-9 mm. longis, 2-2.5 mm. latis, erosis, basi cordata affixis, lobis basalibus excedentibus; folia 30-90 cm. longa; stipites inermes, 24-34 cm. longi, medio 2.5-3.5 mm. diam., basi atroviolacei, sursum brunnei, subglabri, basi paleacei; laminae coriaceae, nitentes, ovatae, usque ad 45 cm. longae et 40 cm. latae, bipinnatae, basi vix reductae, apice pinnatifidae, rhachi supra incurvo-hispida, subtus glabra, sparse paleacea, paleis ovatis vel subrotundis, cordatis; pinnae sub apice pinnatifido 8-12-jugae, patentes, petiolulatae, oblongo-lanceolatae, basi non articulatae, apice pinnatifidae, acuminatae, costa supra strigosa, subtus glabra, epaleacea; pinnulae variabiles, in plantis parvis (depauperatis ?)

[3]By C. V. Morton

9-12 mm. longae et 4.5-5.5 mm. latae, jugae 3 vel 4 basales sessiles, alterae adnatae, subintegrae vel levissime lobatae, apice rotundae, pinnulae in plantis majoribus usque ad 14-jugae, infimae petiolulatae (2 mm.), usque ad 3.5 cm. longae et 1.2 cm. latae, obtusae, basi subcordatae, pinnatifidae, ala costali ca. 1 mm. lata, segmentis sub apice pinnatifido 6-8-jugis, late oblongis, 5-6 mm. longis, 3.5-4 mm. latis, rotundis, crenulatis, parenchymate et costulis glabris, epaleaceis; venae simplices vel in pinnulis majoribus infra medium furcatae; sori pauci, supramediales, saepe tantum in vena anteriore basali; indusium nullum; receptaculum mediocre; paraphyses breves.

Type in the U.S. Nat. Herb., no. 1,498,535, collected on summit of Cerro Duida, Territorio Federal Amazonas, alt. 1650-1800 m., Nov. 26, 1928, *G.H.H.Tate 402*. Additional collections from the same locality are *Tate 626* and *Steyermark 58308*, both representing small, possibly depauperate, forms.

It is somewhat venturesome to describe new species in the vast genus *Alsophila*, for many of the species are imperfectly known, but a search of the literature does not reveal any that seem to be the same as this, or even closely allied. None of the three collections are quite alike, each differing in the degree of dissection of the pinnules, which vary from sessile and subentire to petiolulate and deeply pinnatifid.

Hemitelia dissimilis Morton, sp. nov.

Caudex 15 cm. altus, dense paleaceus, paleis firmis, brunneis, concoloribus, lineari-subulatis, 7-9 mm. longis, 1-1.5 mm. latis, longe attenuatis, basi subtruncata affixis; folia ca. 1.2 m. longa; stipites ca. 55 cm. longi, 5.5-6 mm. diam., brunnei, inermes, sparse verrucosi, glabri, fere epaleacei, bisulcati; laminae ovatae, usque ad 50 cm. latae, basi vix reductae, imparipinnata, rhachi glabra, epaleacea; pinnae coriaceae, basi articulatae, petiolulatae (1-1.8 cm.), majores 25-27 cm. longae, 7 cm. latae, pinnatae, pinna terminalis conformis, pinnulis sessilibus, 14-17-jugis basi articulatis, rhachi angustissime alata, fere glabra, sterilibus oblongis, 3-3.5 cm. longis, 1-1.4 cm. latis, breviter acuminatis, basi truncatis, margine remote crenulatis, fertilibus similibus sed leviter sublobatis, omnibus fere glabris, pilis paucis articulatis et paleis linearibus perpaucis in costulis dissitis; venae liberae, 10- vel 11-jugae, bis furcatae, marginem attingentes; sori submarginales, sub apice venarum omnium; indusia magna, concava, fere 1 mm. lata, brunnea, firma, persistentia, glabra; receptaculum magnum, globosum; paraphyses numerosae, piliformes, septatae.

Type in the U.S. Nat. Herb., nos. 1,915,240-2, collected on Ptaritepuí, south-facing densely forested slopes between Río Karuai and ridge below "Misia Kathy Camp", state of Bolívar, alt. 1250-1520 m., Oct. 27, 1944, *Julian A. Steyermark 59442*; isotype in herb. Chi. Nat. Hist. Mus.

Dr. Copeland (Gen. Fil. 94-99. 1947) reduces the large genera *Hemitelia* and *Alsophila* to *Cyathea*, and since the distinctions between the genera are artificial, there is much to be said for such a course, although I prefer to retain the traditional genera for the time being. There is less merit in his attempt to recognize a number of small genera, such as *Cnemidaria*, *Trichopteris*, and *Schizocaena*, split off from Cyathea (sens. lat.). *Cnemidaria* is typically rather easily recognized by its merely pinnate-pinnatifid blades with subentire pinnules and often anastomosing veins. However, *C. petiolata* (Hook.) Copel. shows a transition to true *Hemitelia* by reason of its bipinnate blades and sometimes subpinnatifid pinnules, although it has the anastomosing veins of *Cnemidaria*. The present species is obviously allied to *H. petiolata*, but has all the veins free. It shows the generic character assigned to *Schizocaena*, confined to the Old World by Copeland, of articulate pinnae. Not only the pinnae but also the pinnules are strongly and functionally articulate in *H. dissimilis* (they are apparently articulate also in *H. petiolata*, although less obviously).

The present species differs from *H. petiolata* as follows:

Frond not reduced upwardly, ending in an articulate terminal pinna conform with the lateral; veins all free; rhizome scales concolorous; stipe unarmed; pinnules up to 3.5 cm. long and 1.4 cm. wide
H. dissimilis.

Frond reduced and pinnatifid at apex; veins often anastomosing; rhizome scales bicolorous, with a narrow white border; stipe prickly; pinnules up to 8.5 cm. long and 2.2 cm. wide.
H. petiolata.

Hemitelia minima Morton, sp. nov.

Caudex ca. 10 cm. longus, erectus, ca. 3 cm. diam., paleis firmis, ovato-lanceolatis, ca. 10 mm. longis et 3 mm. latis, brunneis, concoloribus; folia ca. 60 cm. longa et 20 cm. lata; stipites ca. 30 cm. longi, 3-3.5 mm. diam., inermes, basi subpurpurei, sursum straminei, basi paleacei, paleis ovatis, brunneis, margine pallidioribus, supra incurvo-strigosi, subtus glabri; laminae steriles ovatae, bipinnato-pinnatifidae, rhachi inermi, epaleacea, supra incurvo-strigosa, subtus glabra; pinnae breviter petiolulatae, paucijugae, patentes, usque ad 12 cm. longae et 6 cm. latae, costa utrinque inter pinnas angustissime alata, supra strigosa, subtus plus minusve paleacea, paleis subfiliformibus persistentibus; pinnulis oblongo-lanceolatis, 10-14-jugis, usque ad 3 cm. longis et 1 cm. latis, sessilibus, acutis, costula supra pilosula, segmentis 8-10-jugis, late oblongis, ca. 4 mm. longis et 2.5 mm. latis, glabris, crenulatis, obtusis, ala costulari ca. 0.5 mm. lata; venae 3-vel-4-jugae, infra medium furcatae; laminae fertiles similes sed plus minusve contracta, segmentis incurvis et concavis; sori in lobis unijugi; indusium pallidum, magnum, semicirculare, extrorsum, glabrum; receptaculum magnum; paraphyses multae, elongatae, persistentes.

Type in herb. Chi. Nat. Hist. Mus., no. 1,205,046, collected on forested south-facing slopes overlying sandstone, on "Cave Rock" above "Cave Camp", Ptari-tepuí, state of Bolívar, alt. 1810 m., Oct. 29, 1944, *Julian A. Steyermark 59481.*

In its small size and contracted fertile blades *H. minima* is unlike any species with which I am acquainted. The large and conspicuous indusium suggests that of *Cyathea,* but it is incomplete. Seemingly the inflexed concave margin of the segments functions somewhat as an indusium, protecting the sori while they are young. The type specimen is a unicate. It may represent a somewhat depauperate phase due to exposed conditions.

Hemitelia amabilis Morton, sp. nov.

Caudex 0.9 m. altus, 5-7.5 cm. diam.; folia erecta, ca. 1 m. longa; stipites inermes, breves, ca. 20 cm. longi, 5-8 mm. diam., canaliculati juventute puberuli, demum subglabri, perspicue paleacei, paleis lucidis, albidis, chartaceis, peltatis, anguste triangularibus, 6-10 mm. longis, 3-4 mm. latis, erosis; laminae lanceolatae, subabrupte acuminatae, medio ca. 30 cm. latae, pinnato-pinnatifidae, rhachi incurvo-puberulae, subtus paleis albidis, ovatis, 4-7 mm. longis praedita; pinnae ca. 20-jugae, patentes, lanceolato-ligulatae, longe acuminatae, maximae 17 cm. longae et 3.2 cm. latae (inferiores minores et deflexae), pinnatifidae, ala costalis ca. 2 mm. lata, costis costulisque supra glabra (basi excepta), subtus strigillosis, paleis albidis, subbullatis sparse praeditis; segmenta 15-20-juga, late oblonga, subfalcata, 14-18 mm. longa, 5-6 mm. late, rotundata, integra, margine paullo revoluta, utrinque subglabra; venae liberae, 9- vel 10-jugae, omnes sub medio furcatae; sori saepe 6-jugi, basi rami anterioris venae positi, rotundi; indusia ampla, tenera, semicupuliformia, brunnea, ca. 0.9 mm. lata, glabra, suberosa; receptaculum magnum, ca. 0.25 mm. latum, globosum; paraphyses nullae.

Type in the U.S. Nat. Herb., no. 1,915,330, collected at El Páramo, northeast of Las Delicias, northeast of Caripe, state of Monagas, alt. 1200-1450 m., April 13, 1945, *Julian A. Steyermark 62042;* isotype in herb. Chi. Nat. Hist. Mus.

The most nearly related species is evidently *H. chiricana* Maxon (sect. *Cnemidaria*) of Panama, which is closely similar in cutting and venation, but the scales of stipe and rhachis are quite different, those of *H. chiricana* being dark castaneous or blackish with paler borders, whereas those of the present species are white throughout.

POLYPODIACEAE

Thelypteris brachypoda (Baker) Morton, comb. nov.

Nephrodium brachypodum Baker, Timehri **5**: 213. 1886; Trans. Linn. Soc. London II. Bot. **2**: 290. 1887.

"Ene-bi-gi-yek timunga-teng (remedios chiquitos para bichos)".

On rocks along stream tributary to Río Kukenán, Gran Sabana, in woods at base of Mount Roraima, state of Bolívar, alt. 1185-1280 m., *Steyermark 58588*. This characteristic species has apparently been known from the original collection (Mt. Roraima, *Im Thurn 275*, isotype US).

It is with a good deal of regret that I have finally decided to recognize some of the segregates from *Dryopteris*. It seems to be generally conceded that the comprehensive genus as currently maintained is composed of several diverse elements, and Holttum in his recent paper "A Revised Classification of Leptosporangiate Ferns" (Journ. Linn. Soc. London **53**: 123-158. 1947) goes so far as to put *Thelypteris* in a different family from *Dryopteris*. Such a drastic procedure does not seem necessary to me; in fact, I find it hard to believe that these two groups are not at least somewhat related. However, it does seem possible to define them adequately, and since the inclusive *Dryopteris* is uncomfortably large, there is a definite advantage in segregating it. Copeland, in his useful Genera Filicum (1947), recognizes several genera, such as *Cyclodium*, *Stigmatopteris*, *Ctenitis*, *Lastrea*, *Currania*, *Meniscium*, *Goniopteris*, and *Cyclosorus*. At the present time I prefer to recognize one small aberrent group as *Gymnocarpium* and three large genera: *Dryopteris* (including *Cyclodium*, *Stigmatopteris*, and *Polystichopsis*), *Ctenitis* (including *Parapolystichum*), and *Thelypteris* (including *Goniopteris*, *Meniscium*, *Cyclosorus*, *Glaphyropteris*, *Steiropteris*, and *Leptogramma*).

Copeland's adoption of the later name *Lastrea* instead of *Thelypteris* is unfortunate. He rejected *Thelypteris* because the publishing author, Schmidel, did not adopt the Linnean system of binary nomenclature, but that provision of the International Rules (Article 68, sect. 4) affects only specific epithets and not at all generic names.

Thelypteris Engelii (Hieron.) Morton, comb. nov.

Dryopteris Engelii Hieron. Hedwigia **46**: 339. *pl. 6. fig. 12.* 1907.

Terrestrial, fronds 3 or 4, ascending; southwest-facing forested slopes between Rondón Camp and base of sandstone bluffs, Mount Roraima, state of Bolívar, alt. 2040-2255 m., *Steyermark 58992*. The identification is not certain. The original collection, of which no material is available for consultation, was from Mérida, Venezuela (*Engel 90*).

Thelypteris pilossissima Morton, sp. nov.

Rhizoma breviter repens, crassiusculum, paleaceum, paleis brunneis, lanceolatis, usque ad 6 mm. longis et 1.5 mm. latis, attenuatis, concoloribus, integris, margine pilis paucis simplicibus gerentibus; folia pauca, 18-20 cm. longa, breviter stipitata, stipitibus curvatis, 5-7 cm. longis, ca. 1 mm. diam., paleis minutis hinc inde praeditis,

valde pilosa, pilis rectis, patentibus, simplicibus, unicellularibus, 1-2 mm. longis; laminae herbaceae, lanceolatae, 15-23 cm. longae, 4.5-6 cm. latae, basi gradatim reductae, apicem versus acuminatae, apice ipso obtuso, pinnato-pinnatifidae, rhachi valde pilosa, fere epaleacea; pinna 20-25-jugae, mediales oblongae, 2-3.2 cm. longae, 9-13 mm. latae, basales (4-vel 5-jugae) gradatim minores, infimae subdeltoideae, ca. 12 mm. longae, 10 mm. latae, omnes sessiles, obtusae, altae pinnatifidae, ala costali ca. 1.5 mm. lata, segmentis 5-8-jugis, 4-6.5 mm. longis, 3.5-4.5 mm. latis, obtusis, integris, epaleaceis, basalibus alteris aequalibus, utrinque in mesophyllo et venis longe pilosa, pilis hyalinis, simplicibus, unicellularibus, patentibus, 1-2 mm. longis; venae 3-jugae, simplices, marginem attingentes; sori dorsales, 1-vel-2-jugae, inframediales, rotundi; indusium persistens, subreniforme, minutum, membranaceum, margine longissime ciliatum; sporangia stipitata, non setosa, annulo 14-articulato; sporae brunneae, bilaterales, ca. 40 μ longae et 25 μ latae, tuberculatae.

Type in the U.S. Nat. Herb., no. 1,915,091, collected on ascent of ledge along southwest-facing side, from beginning of sandstone bluffs to summit, Mt. Roraima, alt. 2255-2620 m., Sept. 27, 1944, *Julian A. Steyermark 58772;* isotype in herb. Chi. Nat. Hist. Mus.

In Posthumus' Ferns of Surinam this species will key to *T. opposita,* which it in no way resembles, differing in the few reduced lower pinnae, few veins, obtuse pinnae and segments, and long-pilose indument on both surfaces of the frond. In the indument the present species suggests the little-known *Dryopteris longipilosa* (Sodiro) C. Chr.

Thelypteris reptans (Gmel.) Morton, comb. nov.

Polypodium reptans Gmel. Syst. Nat. **22**: 1309. 1791.

Monagas: in crevices within cave entrance, Guácharo Cave, 6 kms. northwest of Guácharo, alt. 950 m., *Steyermark 62305.*

Ctenitis catocarpa (Kunze) Morton, comb. nov.

Aspidium catocarpum Kunze, Linnaea **9**: ,95. 1834.

ANZOÁTEGUI: along Río Zumbador and tributary, near base of Piedra Blanca, northeast of Bergantín, alt. 800-1000 m., *61279.* Kunze described two species, *Aspidium catocarpum* and *A. nemophilum,* at the same time and place. Mettenius regarded these as synonyms, doubtless correctly, and adopted the name *A. catocarpum.* Christensen had a similar viewpoint, but adopted the name *Dryopteris nemophila,* because this species was a larger, better developed form and because it had page priority. These considerations, however, have nothing to do with the choice of name. Since Mettenius was the first to unite the two species, his choice of the epithet *catocarpum* must stand.

Ctenitis platyloba (Baker) Morton, comb. nov.

Polypodium platylobum Baker in Hook. & Baker, Syn. Fil. 307. 1867.

SUCRE: terrestrial, fronds membranaceous, Cerro Turumiquire, north-facing slopes between La Trinidad and Quebrada El Boquerón, southwest of Cocollar, alt. 1700-1840 m., *62438*. Identified from description. Possibly known previously only from the original description from Tarapoto, Peru.

Polybotrya crassa Morton, sp. nov.

Rhizoma crassum, elongatum, repens, 1-1.5 cm. diam., paleis exclusis, densissime paleaceum, paleis lineari-lanceolatis, 1-2 cm. longis, 1-2.5 mm. latis, brunneis, patentibus, longe attenuatis, glabris, integris; folia deformia, sterilia ca. 1.5 m. longa, stipitibus ca. 35 cm. longis, 7 mm. diam., plus minusve praecipue basin versus paleaceis, supra trisulcatis; lamina lanceolata, medio ca. 50 cm. lata, basi paullo angustata, apice acuminata, pinnata, apice pinnatifida, rhachi parce paleacea, inconspicue appresso-pilosa; pinnae ca. 18-jugae, inferiores et mediales petiolulatae (usque ad 5 mm.), superiores adnatae, lineari-lanceolatae, maximae 26 cm. longae et 5 cm. latae, basi truncatae, apice longe attenuatae, majores sub medio dentato-lobatae, sursum denticulatae, lobis infimis superioribus (et saepe etiam inferioribus) fere liberis, ovatis, basi angustatis, superiores basi superiori auriculatae, omnes subcoriaceae, fere epaleaceae, subtus parcissime appresso-pilosae, pilis brunneis, multicellularibus, flaccidis; venae primariae ca. 35-jugae (in pinnis majoribus), fere horizontaliter patentes, pinnato-ramosae, ramis 3-5-jugis, in vena excurrente inter venas primarias acute anastomosantibus; folia fertilia 80-90 cm. longa, stipitibus 27 cm. longis, dense paleaceis; lamina ca. 30 cm. lata, ovato-lanceolata, bipinnato-pinnatifida, rhachi paleacea; pinnae patentes, ca. 15 cm. longae et 3.5 cm. latae, petiolulatae, attenuatae, pinnulis multijugis, subremotis, linearibus, 1.5-1.8 cm. longis, 2-2.5 mm. latis, segmentis parvis, 5-7-jugis, alternis, remotis, semicircularibus, ca. 1 mm. longis, 1.5 mm. latis, utrinque sporangiferis; annulus ca. 14-cellularis; sporae bilaterales, laeves, 50-56 u longae, 40-50 u latae.

Type in the U.S. Nat. Herb., nos. 1,915,221-2, collected on south-facing forested slopes above limestone bluffs, northeast of Guácharo, state of Monagas, alt. 1300-1400 m., April 11, 1945, *Julian A. Steyermark 61991*, "climbing, with elongate rhizome appressed tightly to small tree trunk; sterile fronds chartaceous, dull green above, pale green below"; isotype in herb. Chi. Nat. Hist. Mus. Differs from *P. suberecta* (Baker) C. Chr., *P. polybotryoides* (Baker) Christ, and related species in the lobate, basally auricled sterile pinnae and the more divided (bipinnate-pinnatifid) fertile fronds.

Paesia acclivis (Kunze) Kuhn var. **polystichoides** Morton, var. nov.

Rhizoma deest; folia scandentia, 1.6-2.6 m. longa (t. Steyermark); lamina tripinnato-pinnatifida, rhachi 3-4 mm. diam., valde flexuosa,

tereti, brunnea, nitente, decidue pilosa, pilis brunneis, septatis; demum aspera, internodiis 7-8 cm. longis; pinnae lanceolatae, numerosae, alternae, angulo acute adscendentes, maximae ca. 50 cm. longae et 22 cm. latae, petiolulatae (2-2.5 cm.), basi vix reductae, apice attenuatae, rhachi subrecta; pinnulae usque ad 30-jugae, horizontaliter patentes, alternae, inferiores petiolulatae, superiores sessiles, maximae 11 cm. longae et 2.3 cm. latae, rhachilla angustissime alata, pinnulis tertiariis usque ad 20-jugis alternis, anadromicis, oblongo-lanceolatis, 1-1.3 cm. longis, 6-8 mm. basi latis, sessilibus, basi truncatis, apice acutis, infra medium alte pinnatifidis, sursum crenatis, lobis vel crenaturis 5-8-jugis, obtusis, saepe crenulatis, subcoriaceae, supra ubique glabrae, subtus in costa et costulis parce septato-pilosae, epaleaceae; venae liberae, furcatae, marginem attingentes; sori marginales continui, indusiis extrorsis et introrsis magnis, ca. 6 mm. latis, brunneis, membranaceis, glabris, erosis; sporangia magna, breviter stipitata, annulo 15-articulato; paraphyses nullae; sporae bilaterales, laeves, 50-60 μ longae, ca. 45 μ latae.

Type in the U.S. Nat. Herb., nos. 1,915,278-9, collected at base of and on main south-facing sandstone bluffs of Ptari-tepuí, state of Bolívar, alt. 2400-2410 m., October 30, 1944, *Julian A. Steyermark 59600*, "fronds pale green beneath; stipes dark purple"; isotype in herb. Chi. Nat. Hist. Mus.

I have described this variety at length, because it may prove to be a distinct species. Mettenius' illustration (Abh. Senckenb. Naturf. Ges. Frankfurt 2: *pl. 16, fig. 9-12.* 1858) of plants of the original collection from Mérida, Venezuela, *Funck & Schlim 1222*) shows the tertiary pinnules rounded, a character sufficient to give the plant an entirely different aspect from the present variety, in which the tertiary pinnules are acute and deeply parted, a single pinna rather suggesting a whole frond of a *Polystichum*, such as *P. muricatum.*

GLEICHENIACEAE

Sticherus penniger (Mart.) Morton, comb. nov.

Mertensia pennigera Mart. Icon. Crypt. Bras. **130.** *pl. 59, f. 1.* 1834.

"itɨ-yek". Southwest-facing slopes bordered by hilly savana, Mount Roraima, alt. 1030-1155 m., *Steyermark 58605.* I have not seen any authentic material (the type was collected by Martius in Minas Gerais, Brazil), but from the description and illustration there seems little doubt that Martius's species is identical with the widespread South American plant described as *Mertensia lanuginosa* Moric., of which an isotype (*Blanchet 3706* from Bahia, Brazil) is in the New York Botanical Garden. The species has passed under a variety of names, including *Gleichenia bifida, G. furcata,* and *G. pubescens.* It was collected long ago on Roraima by Schomburgk (specimen in U.S. Nat. Herb.) and probably others. However, the plant reported by

Baker (*im Thurn 343*, specimen in U.S. Nat. Herb.) as *Gleichenia pubescens* is not this species, but **Sticherus velatus** (Kunze) Morton, comb. nov. (*Mertensia velata* Kunze, Linnaea 9: 15. 1834), the type of which was collected at Pampayacu, Peru, by Poeppig. A fragment of it is in the U.S. Nat. Herb. Synonyms are *Gleichenia Buchtienii* Christ & Rosenst. and *G. blepharolepis* Sodiro. Although *S. velatus* has a wide range in South America, it is not common. It is a huge species with very broad pinnae, and may be distinguished readily from both *S. bifidus* and *S. penniger* by the segments being scaly-tomentose above when young and by the blackish scales of the axes and buds. It is likely that the Roraima specimens reported by Posthumus as *G. longipinnata* belong to *S. velatus*. I know the true *Sticherus longipinnatus* (Hook.) Ching only from Surinam (*Hostmann 238*, photograph and fragment of the type in U.S. Nat. Herb.).

Sticherus rubiginosus (Mett.) Morton, comb. nov.

Gleichenia rubiginosa Mett. Ann. Sci. Nat. Paris V. 2: 267. 1864.

SUCRE: Cerro Turumiquire, north-facing slopes above La Trinidad in cloud forest zone, southwest of Cocollar, alt. 2100-2200 m., *Steyermark 62521*. MONAGAS: Cerro Negro, above La Sabana de las Piedras, northwest of Caripe, alt. 1500-2180 m. *62103*. These specimens, due probably to the method of drying, have lost the glaucous tinge characteristic of the lower surfaces. The species was collected in 1925 in Cerro Turumiquire (2900 m.) by Tate (no. *277*). Fragments of the type collection (*Lindig 71* from Puente Nacional, Colombia) have been examined in the U.S. National Herbarium and New York Botanical Garden. The range of the species includes Venezuela, Colombia, and Peru, and a single specimen was found some years ago in Puerto Rico.

It is with some regret that I have decided to recognize the genus *Sticherus* as distinct from *Dicranopteris*, following Christensen, Ching, Copeland, and St. John, because of the habital similarity of the two groups. However, it is obvious that the peculiar nature of the branching in this family renders a habital similarity inevitable. The technical distinctions between the genera have been pointed out clearly by M. A. Chrysler (Amer. Journ. Bot. 31: 483-491. 1944) in his study of the vascular anatomy of the petiolar bundles. The fundamental distinction is that *Dicranopteris* (sens. strict.) has only hairs on the rhizomes and fronds, whereas *Sticherus* has ciliate scales on the rhizomes and usually on the fronds also. A simple method of distinguishing the genera is by the veins of the segments, those of *Sticherus* being all once-forked (or rarely the basal pair twice-forked) whereas those of *Dicranopteris* are all twice- or thrice-forked. The character of numerous sporangia to a sorus, attributed to *Dicranopteris*, is not uniformly true in all species, nor is the development of accessory pinnae apparently of fundamental importance, for *D. pectinata* has none.

Dicranopteris Schomburgkiana (Sturm) Morton, comb. nov.

Mertensia Schomburgkiana Sturm in Mart. Fl. Bras. 1^2: 233. 1859.

Fronds with branches horizontally spreading, the segments gray on older fronds below, ferruginous on younger ones and on young stems; ascent of ledge along southwest-facing side, Mount Roraima, alt. 2100-2255 m., *Steyermark 58718*. The type came from Mt. Roraima (*Schomburgk 1671*, fragments in U.S. Nat. Herb. and N.Y. Bot. Gard.), and the species has probably not been found since, so the present collection is noteworthy. This species has been considered the same as *Dicranopteris rufinervis* (Mart.) Ching of Minas Gerais, Brazil, which Posthumus calls *Gleichenia linearis* var. *rufinervis*. Martius' description is too brief to be conclusive, but *Gleichenia Klotzschii* Hook., which is considered to be the same as *rufinervis*, is obviously distinct from *D. Schomburgkiana*. A comparison of fragments of the type of *G. Klotzschii* with the new specimens collected by Steyermark shows that the differences enumerated by Sturm hold true.

SPERMATOPHYTA

GRAMINEAE[4]

Thrasya setosa Swallen, sp. nov.

Perennis; culmi graciles erecti, ramosi, glabri, nodis inferioribus barbatis; vaginae internodia aequans, carinatae, pilosae vel papilloso-pilosae, suprema elongata, glabra, marginibus papilloso-ciliata; ligula membranacea, erosa, 1.5 mm. longa; laminae planae, 10-30 cm. longae, 2-3 mm. latae, attenuatae, pilosae, marginibus papilloso-hispidis; racemi terminales et axillares, solitarii, 8-12 cm. longi basi dense pilosi, rachi 1.8 mm. lata, papilloso-ciliata, pilis 2-5 mm. longis; spiculae 3 mm. longae; gluma prima obsoleta, gluma secunda plana, 5-nervis, acuta, scabra, summo marginibus hispida; lemma sterile gluma secunda paulo brevior summo 2-carinatum, carinis hispido-ciliatis; fructus 2.4 mm. longus, 0.7 mm. latus, summo dense pilosus pilis 0.5 mm. longis.

Perennial; culms slender, erect or somewhat geniculate, branching at the lower nodes, glabrous, smooth and shining, the nodes retrorsely bearded; sheaths about as long as the internodes, keeled, at least toward the summit, pilose or papillose-pilose with spreading hairs, the uppermost elongate, glabrous on the back, the margins papillose-ciliate; ligule membranaceous, erose, 1.5 mm. long; blades flat, 10-30 cm. long, 2-3 mm. wide, the uppermost greatly reduced, attenuate, pilose, the margins and underside of the mid-nerve papillose-hispid; inflorescences terminal and axillary, the axillary entirely enclosed in the sheath, of one arcuate raceme 8-12 cm. long, densely pilose at the base, the rachis 1.8 mm. wide, papillose-ciliate, the hairs 2-5 mm. long; spikelets 3 mm. long; first glume obsolete; second glume flat, 5-nerved, acute, scabrous, the margins hispid at the tip; sterile lemma a little shorter than the second glume enclosing a well-developed palea and staminate flower, early splitting down the middle, the margins incurved partly enclosing the fruit, 2-keeled toward the summit, the keels hispid-ciliate, each with a rather stout yellowish seta about 2 mm. long near the tip; fruit 2.4 mm. long, 0.7 mm. wide, the margins of the lemma densely pilose at the tip, the hairs about 0.5 mm. long.

Type in the U.S. Nat. Herb., no. 1,911,654, collected in vicinity of Sanariapo, near Río Sanariapo, tributary of Orinoco river, Territorio Federal Amazonas, alt. 100 m., September 8, 1944, *Julian A. Steyermark 58502*; isotype in herb. Chi. Nat. Hist. Mus.

Thrasya setosa is related to *T. paspaloides* which differs in having shorter racemes, mostly 4-5 cm. long, the axillary ones

[4]By Jason R. Swallen. Bambuseae, except *Myriocladus*, by F. A. McClure

long exserted, wider rachis (2.5 mm.), and the second glume densely papillose-hispid all over the back, the hairs long.

Eragrostis fragilis Swallen, sp. nov.

Perennis; culmi caespitosi, 20-30 cm. alti, glabri; vaginae internodiis longiores, dense pilosae, pilis adscendentibus vel patentibus; ligula ciliata 0.3 mm. longa; laminae 8-12 cm. longae, 1-3 mm. latae, planae, firmae, attenuatae, dense pilosae vel papilloso-pilosae; paniculae 12-18 cm. longae, 6-9 cm. latae, ramis fragilibus adscendentibus, simplicibus vel infra medium sparse ramosis, ramulis divergentibus, in axillis longe pilosis; spiculae 3.5-4.5 mm. longae, 1.5 mm. latae, 4-6-florae, pedicellibus 5-10 mm. longis; glumae subaequales, 1-1.3 mm. longae, 1-nerves, acutae; lemma infimum 1.5-1.8 mm. longum, acutum; rachilla sparse pilosae; caryopsis 0.5-0.6 mm. longa rectangularis, reticulata, sulcata.

Perennial; culms in small tufts, 20-30 cm. high, erect, glabrous; sheaths all longer than the internodes, rather densely pilose with ascending or spreading hairs; ligule ciliate, 0.3 mm. long; blades mostly 8-12 cm. long, 1-3 mm. wide, firm, flat, attenuate, densely pilose or papillose-pilose on both surfaces; panicles 12-18 cm. long, as much as 6-9 cm. wide, the branches fragile, ascending, simple or sometimes branching from below the middle, the branchlets divergent, long-pilose in all the axils; spikelets 3.5-4.5 mm. long, 1.5 mm. wide, 4-6-flowered, the pedicels mostly 5-10 mm. long; glumes subequal, 1-1.3 mm. long, 1-nerved, acute; first lemma 1.5-1.8 mm. long, acute; rachilla sparsely pilose, at least below the floret; caryopsis 0.5-0.6 mm. long, rectangular, reticulate, rather deeply sulcate on one edge.

Type in U.S. Nat. Herb., no. 1,911,657, collected on Gran Sabana, between Kun and Uaduara-parú, in valley of Río Kukenan, south of Mount Roraima, state of Bolívar, alt. 1065-1220 m., October 1, 1944, *Julian A. Steyermark 59062.*

Digitaria glabriculmis Swallen, sp. nov.

Perennis; culmi erecti, 63 cm. alti, glabri, summo sparse pilosi; vaginae hirsutae, suprema 24 cm. longa, glabra; ligula membranacea 0.5-1 mm. longa; laminae planae, erectae, ad 25 cm. longae, subtus glabrae, supra dense villosae; racemi 3, 9-11 cm. longi, rachi 0.5 mm. lata, marginibus scabris; spiculae 1.5-1.7 mm. longae, dense pubescentes pilis capitatis; gluma prima obsoleta; gluma secunda angusta, 3-nervis, obtusa, fructo 1/3 brevior; lemma sterile fructum aequams subacutum 8-nerve; fructus 1.7 mm. longus, ellipticus, acutus, fuscescens, perspicue striatus.

Perennial; culms erect, 65 cm. high, glabrous, with a few

scattered hairs toward the summit; basal sheaths crowded, sparsely to densely hirsute with ascending hairs, the uppermost 24 cm. long, bladeless, glabrous; ligule membranaceous, 0.5-1 mm. long; blades flat, sub-attenuate, erect, as much as 25 cm. long, 4 mm. wide, glabrous below, very densely villous above; racemes 3, 9-11 cm. long, erect or narrowly ascending, the rachis 0.5 mm. wide, scabrous on the margins; spikelets in threes, crowded, 1.5-1.7 mm. long, densely pubescent with capitate hairs; first glume wanting; second glume narrow, 3-nerved, obtuse, 2/3 as long as the fruit; sterile lemma as long as or slightly longer than the fruit, subacute, 7-nerved, the lateral and intermediate nerves obscure, thus appearing 3-nerved; fruit 1.7 mm. long, elliptic, acute, very dark reddish-brown, rather prominently striate.

Type in herb. Chi. Nat. Hist. Mus., no. 1,206,512, collected on Gran Sabana, between waterfall at Rue-merú (tributary of Río Kukenán) and Divina Pastora on Río Kukenán north of Santa Elena, south of Mount Roraima, state of Bolívar, alt. 1065 m., October 3, 1944, *Julian A. Steyermark 59226.*

Digitaria glabriculmis is similar to *D. villiculmis* Henr. which differs in having culms conspicuously villous throughout, blades villous on both surfaces, usually not more than 12 cm. long, and larger spikelets 1.8-2 mm. long.

Axonopus erectus Swallen, sp. nov.

Perennis; culmi 145 cm. alti, erecti rigidi compressi, infra inflorescentiam scaberuli, nodo dense antrorse pilosae; vaginae latae, compressae, basi papilloso-hispidae, collo dense pubescentes, suprema ad 45 cm. longa; ligula dense ciliata 0.5 mm. longa; laminae lineares, 23-33 cm. longae, 12 mm. latae, planae, basi conduplicatae, marginibus scaberrimis; inflorescentiae terminales et axillares, 12-27 cm. longae, densae, erectae, racemis adscendentibus usque ad 13 cm. longis; spiculae 2.5-2.6 mm. longae; gluma secunda et lemma sterile aequalia, obtusa, 5-nervia, inter nervos dense pubescentia; fructus 2.3 mm. longus, subacutus, minute papillosus, summo sparse pubescens.

Perennial; culms stiffly erect, 145 cm. high, hard, flattened, appearing triangular toward the base, 1-noded, the node densely antrorsely appressed-pilose, scaberulous below the inflorescence, otherwise glabrous; sheaths broad, conspicuously compressed, densely pubescent on the collar, papillose or papillose-hispid near the base, otherwise glabrous or nearly so, the lower ones relatively short, the uppermost as much as 45 cm. long; ligule densely ciliate, 0.5 mm. long; blades linear, conduplicate toward the base, becoming flat, strongly nerved,

glabrous, the margins very scabrous, the tip obtuse, 23-33 cm. long, 12 mm. wide, the uppermost greatly reduced; panicles terminal and axillary, long-exserted, 12-27 cm. long, erect, dense, the compound branches narrowly ascending, as much as 13 cm. long, densely pubescent or pilose in the axils, the rachis very scabrous; spikelets 2.4-2.6 mm. long, the second glume and sterile lemma equal, covering the fruit, 5-nerved, obtuse, rather densely pubescent between the nerves; fruit 2.3 mm. long, oblong, acutish, minutely papillose-roughened, somewhat pubescent at the tip.

Type in U.S. Nat. Herb., no. 1,911,664, collected on Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest of Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59400.* Also collected between Kun and Uaduara-parú, in valley of Río Kukenán, south of Mount Roraima, *59050.*

This species is probably most closely related to *Axonopus scoparius* Flugge, but easily distinguished by the prominent conduplicate sheaths pubescent on the collar, the firmer and narrower obtuse blades, and the narrow, dense inflorescences.

Axonopus Steyermarkii Swallen, sp. nov.

Perennis; culmi ca. 45 cm. alti glabri uninodi; vaginae equitantes 10 cm. longae, compressae, glabrae, suprema elongata lamina reducta; ligula ciliata 0.5 mm. longa; laminae planae, 10-24 cm. longae, 2.5-6 mm. latae, glabrae, marginibus scabris; inflorescentiae terminales et axillares, racemis 3-4, adscendentibus approximatis infimo remoto; rachis 0.4 mm. lata; spiculae 2.8-3 mm. longae, pedicellis 1 mm. longis pilosis; gluma secunda et lemma sterile aequalia, angusta, obtusa, 5-nervia, nervis lateralibus approximatis, inter nervos sparse pilosa; fructus 2.5 longus, ellipticus, lemmate summo villoso.

Perennial; culms about 45 cm. high. glabrous, with a single culm node; sheaths equitant, about 10 cm. long, compressed, gradually narrowed from the base to the summit, glabrous, the culm sheath elongate with a reduced blade; ligule ciliate, 0.5 mm. long; blades flat, 10-24 cm. long, narrower at the base than the mouth of the sheath, glabrous, the margins scabrous at the tip; inflorescences terminal and axillary with 3-4 ascending racemes, the upper ones approximate, the lowest somewhat remote, pubescent or pilose at the base, the rachis triangular, about 0.4 mm. wide; spikelets 2.8-3 mm. long, blunt, rather distant, not reaching the one above on the same side, pedicellate, the pedicel round, about 1 mm. long, more or less pilose; second glume and sterile lemma equal, exceeding the fruit, thin, narrow, exposing the fruit on the sides,

obtuse, 5-nerved, the lateral nerves approximate near the margins, irregularly pilose between the lateral nerves or sometimes nearly glabrous, with a tuft of hairs at the tip; fruit 2.5 mm. long, elliptic with a dense tuft of hairs on the tip of the lemma.

Type in U.S. Nat. Herb., no. 1,911,649, collected on Cerro Duida, southeastern-facing sandstone bluffs near Caño Negro (tributary of Caño Iguapo), alt. 1095-1520 m., August 26, 1944, *Julian A. Steyermark 58001.*

Axonopus Steyermarkii is closely related to *A. Fockei* (Mez) Swallen, comb. nov. (*Paspalum Fockei* Mez) which differs in having sessile spikelets, blades wider at the base than the mouth of the sheath, densely bearded nodes, and ciliate sheaths.

Axonopus villosus Swallen, sp. nov.

Perennis; culmi erecti, ca. 70 cm. alti, nodis antrorse barbatis; vaginae compressae, dense villosae, inferiores equitantes, basi glabrae; ligula ciliata ca. 0.3 mm. longa; laminae ca. 50 cm. longae, 7 mm. latae, conduplicatae, subtus dense villosae supra basi glabrae; inflorescentiae terminales et axillares; racemi 3-7, erecti, rachi scabra; spiculae 3.5-4 mm. longae; gluma secunda et lemma sterile aequalia fructo paulo longiora, summo sparse pilosa, 5-nervia, nervis lateralibus approximatis, inter nervos sparse pubescentia; fructus 3 mm. longus, subacutus, minute papillosus, lemmate summo villoso.

Perennial; culms erect, about 70 cm. high, the nodes antrorsely appressed-bearded; sheaths conduplicate, very densely villous with tawny hairs, especially at the summit, the lower equitant, glabrous toward the base; ligule ciliate, about 0.3 mm. long; blades overtopping the inflorescence, the lower surface densely appressed villous, the upper less so, becoming glabrous at the base, tightly folded, becoming flat with age, about 50 cm. long, 7 mm. wide unfolded; inflorescences terminal and axillary, composed of 3-7 erect racemes, the axis 2-5 cm. long, the rachis scabrous; spikelets 3.5-4 mm. long, rather distant; second glume and sterile lemma equal, extending a little beyond the fruit, sparsely pilose at the tip, 5-nerved, the lateral nerves of the glume approximate, usually sparsely pubescent between the nerves; fruit 3 mm. long, acutish, minutely papillose roughened, the lemma villous at the tip.

Type in herb. Chi. Nat. Hist. Mus., no. 1,206,470, on summit of Cerro Duida, Savanna Hills, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58226.*

Axonopus villosus is similar to *A. comatus* (Mez) Swallen, comb. nov. (*Paspalum comatum* Mez) described from Brazil, the definite locality unknown, which differs in having the second glume 9-nerved, the nerves evenly spaced, and the culms densely villous below the nodes.

Paspalum aureolatum Swallen, sp. nov.

Perenne; culmi erecti, 75 cm. alti, glabri; vaginae elongatae, glabrae vel summo sparse papilloso-hispidae, superiores internodiis breviores; ligula 3.5-4 mm. longae; laminae 20-30 cm. longae, usque ad 7 mm. latae, scaberulae, marginibus basi sparse hispido-ciliatis; racemi 4, 7.5-8 cm. longi, patentes, basi barbati; rachis 5-5.5 mm. lata, supra spiculas producto; gluma secunda 5.3 mm. longa, ovata, truncata, hyalina, 3-5-nervis, scaberula, basi pilosa, summo hispidula; lemma sterile glumam secundam aequans, 3-nerve, dorso glabrum, marginibus papilloso-hispido-ciliatis; fructus 3.8-4.2 mm. longus, stipitatus, marginibus hispidis, summo hispidulus; palea glabra.

Perennial; culms erect, 75 cm. high, glabrous; sheaths elongate, glabrous or sparsely papillose-hispid near the summit, the lower much longer than the internodes, the upper shorter; ligule conspicuous, reddish brown, the lower ones 3.5-4 mm. long; blades 20-30 cm. long, as much as 7 mm. wide, scaberulous, the margins sparsely hispid-ciliate toward the base; racemes 4, crowded on a short axis, 7.5-8 cm. long spreading, bearded at the base, the rachis 5-5.5 mm. wide, extending beyond the spikelets; second glume 5.3 mm. long, ovate, thin, 3-5-nerved, the nerves fine, more or less transversely nerved, scaberulous, hairy across the back at the base, shortly hispid near the truncate tip; sterile lemma as long as the second glume, 3-nerved, glabrous on the back, the margins papillose-hispid-ciliate, sparsely so above the middle; fruit 3.8-4.2 mm. long, stipitate, the margins hispid at the middle, the hairs rather long, the tip shortly hispid; palea glabrous (Fig. 1).

Type in U.S. Nat. Herb., no. 1,911,652, collected on summit of Cerro Duida, Savanna Hills, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58234.*

The hispid fertile lemma distinguishes *P. aureolatum* from the other species of the *Dissecta* group. It is similar to *P. contractum* which has bearded nodes, hispid foliage, a shorter ligule, about 1.5 mm. long, and usually only two racemes. The fruit is not more than 3.4 mm. long, and lacks the long hairs on the margins of the lemma.

Paspalum erectifolium Swallen, sp. nov.

Perenne; culmi erecti, 55-70 cm. alti, glabri vel scaberuli; vaginae inferiores internodiis multo longiores, dense papilloso-hispidae, superiores internodiis longiores vel breviores, glabrae vel marginibus sparse pilosae; ligula membranacea, 1-1.5 mm. longa; laminae firmae, appressae vel adscendentes, acutae, pungentes, pubescentes et dense hispidae, marginibus papilloso-ciliatis, inferiores 5-7 cm. longae, 7-12 mm. latae; racemi 2, approximati, 5-6 cm. longi, basi dense pilosi, rachi 3-3.5 mm. lata, alata, glabra supra spiculas procurrente; spiculae compressae, appressae; gluma secunda 5.6 mm.

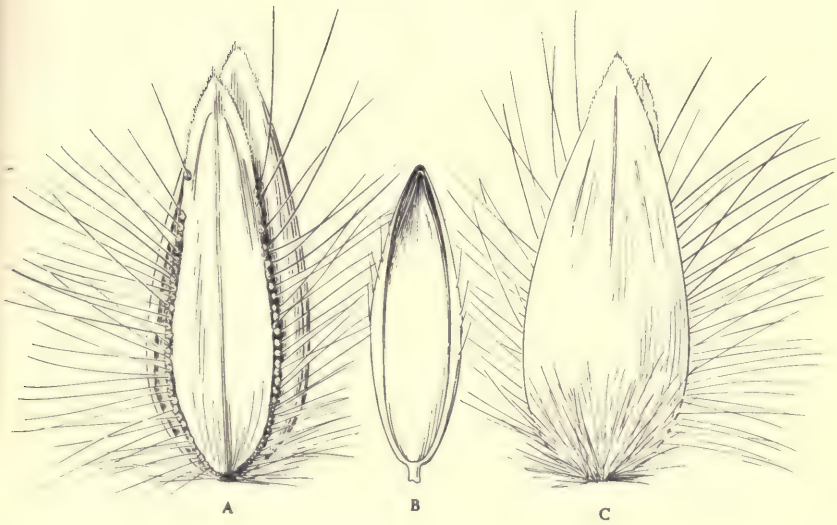

FIGURE 1

Paspalum aureolatum Swallen, sp. nov. (*Steyermark 58234*)
A, Spikelet, X 10; B, Fruit, X 10; C, Second Glume, X 10

longa, 3 mm. lata, alata, cordata, obtusa, 5-nervis, nervis lateralibus approximatis, marginibus hispido-ciliatis; lemma sterile 5 mm. longum, 2.5 mm. latum, 3-nerve, scabrum, marginibus hispido-ciliatis, summo seta 2.5-3.5 mm. longa praeditum; lemma fertile 4.5 mm. longum, lanceolatum, stipitatum, summo hispidum, marginibus angustis sparse hirsutis; palea striata, sparse pubescens.

Perennial; culms strictly erect, 55-70 cm. high, glabrous or more or less scabrous; lower sheaths much longer than the internodes, densely papillose-hispid, the upper three bladeless, elongate, longer or shorter than the internodes, glabrous or sparsely long-pilose near the margins; ligule a reddish-brown membrane 1-1.5 mm. long, irregularly dentate; blades thick, firm, usually appressed, or the lower ones somewhat spreading, the lowermost 5-7 cm. long, 7-12 mm. wide, the others gradually smaller upwards, acute, pungently pointed, pubescent and densely hispid, the margins strongly papillose-hispid-ciliate; racemes 2, approximate, somewhat spreading, 5-7 cm. long, densely hairy at the base, the rachis extending beyond the spikelets, glabrous, 3-3.5 mm. wide, winged, the center green and purple

striped, the wings brownish; spikelets very flat, closely appressed; second glume 5.6 mm. long, 3 mm. wide at the base, winged, prominently cordate, obtuse, 5-nerved, the lateral nerves approximate, transversely veined, the margins hispid-ciliate; sterile lemma 5 mm. long, 2.5 mm. wide, oval, somewhat cordate at the base, 3-nerved, scabrous, the margins hispid-ciliate, the hairs shorter than those of the second glume, with a prominent seta at the summit 2.5-3.5 mm. long; fertile lemma 4.5 mm. long, lanceolate, somewhat stipitate, with a tuft of hispid hairs at the summit, the margins narrow, sparsely hirsute; palea thin, striate, sparsely pubescent above the middle.

Type in U.S. Nat. Herb., no. 1,911,668, collected on savanna and shrubby growth bordering forest of Río Karuai, between Santa Teresita de Kavanayén and base of Ptari-tepuí, state of Bolívar, alt. 1220 m., November 18, 1944, *Julian A. Steyermark 60302.*

Paspalum erectifolium is related to *P. setiglume* Chase, described from Auyan-tepuí, which differs in being much taller, more than 1 meter with six racemes 10-12 cm. long, and much longer, linear blades which are only sparsely hispid. Both are distinguished from all other known species of *Paspalum* by the long terminal seta of the sterile lemma.

Paspalum piligerum Swallen, sp. nov.

Perenne; culmi erecti, 70 cm. alti; vaginae internodiis longiores, inferiores breves dense papilloso-hispidae, superiores elongatae sparse papilloso-hispidae, 2 supremae efoliatae, scabrae; ligula membranacea 2 mm. longa; laminae firmae, acuminatae, pungentes, valde papilloso-hispidae, infima 17 cm. longa, 12 mm. lata; racemi 4, approximati, 11-14 cm. longi, in axillis dense pilosi; rachis 8 mm. lata, glabra; spiculae appressae basi barbatae; gluma secunda 7 mm. longa, ovato-lanceolata, 3-nervis, dorso basi dense pilosa, summo marginibus hispida; lemma sterile 5.7 mm. longum, lanceolatum, sparse papilloso-hispidum, marginibus in parte inferiore dense papilloso-ciliatis, in parte superiore scabris; fructus 4 mm. longus, stipitatus, lemma lanceolato minute scabro, summo hispido; palea glabra obtusa.

Perennial; culms erect, 70 cm. high; leaves mostly crowded toward the base; sheaths all longer than the internodes, the lower ones short, very densely papillose-hispid, the upper ones elongate, less densely papillose-hispid, the two uppermost bladeless, scabrous only; ligule membranaceous, about 3 mm. long; blades thick, firm, acuminate, pungently pointed, very densely papillose-hispid on both surfaces, the hairs on the upper surface interlacing on either side of the midnerve, the lower ones 17 cm. long, 12 mm. wide, becoming smaller upward; racemes 4, ascending, approximate on a short axis, 11-14 cm. long, with dense tufts of white hairs in the axils, the rachis extended beyond the spikelets, broadly winged, 8 mm. wide, glabrous, the midrib green, the wings straw-colored; spikelets crowded, appressed, bearded at the base; second glume 7 mm. long,

ovate-lanceolate, 3-nerved, rather densely hairy across the back at the base, hispid on the margins near and at the tip, otherwise glabrous; sterile lemma 5.7 mm. long, lanceolate, very sparsely papillose-hispid above, the margins very densely papillose-ciliate in the lower half, scabrous above; fruit 4 mm. long, stipitate, the stipe about 0.4 mm. long, the lemma lanceolate, minutely scabrous, hispid at the tip, the palea glabrous, rounded at the tip (Fig. 2).

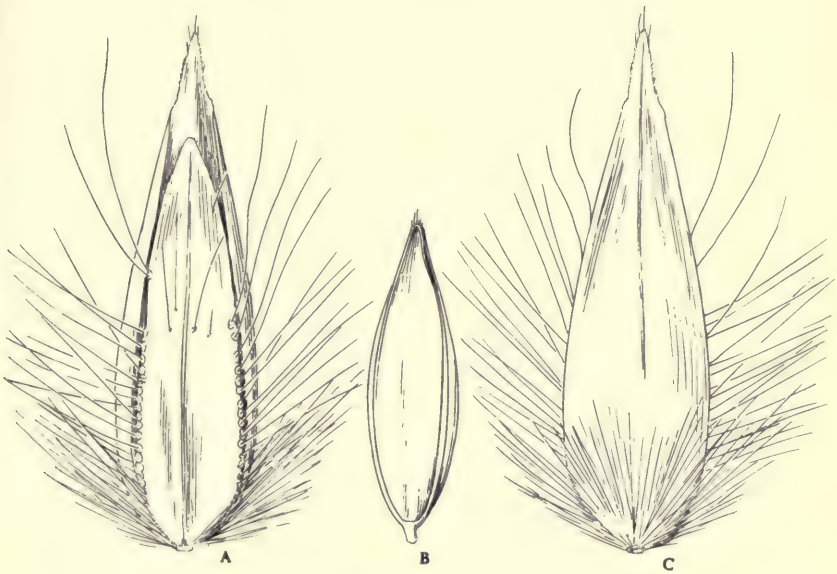

FIGURE 2

Paspalum piligerum Swallen, sp. nov. (*Steyermark 59090*)
A, Spikelet, X 10; B, Fruit, X 10; C, Second glume, X 10

Type in U.S. Nat. Herb., no. 1,911,660, collected on Gran Sabana, between Kun and Uaduara-parú, in valley of Río Kukenán, south of Mount Roraima, state of Bolívar, alt. 1065-1220 m., October 1, 1944, *Julian A. Steyermark 59090.*

Paspalum piligerum is unusual in the extremely dense interlacing hairs on the upper surface of the blades. It is allied to *P. lanciflorum* Trin. which has only 2, or rarely more, short conjugate racemes, and narrower, linear, sparsely hispid blades.

Panicum densifolium Swallen, sp. nov.

Perenne; culmi gracillimi, dense caespitosi, 10-19 cm. alti, erecti, ramosissimi; vaginae internodiis longiores, glabrae; ligula membra-

nacea ca. 1 mm. longa; laminae 7-25 mm. longae, 0.8-1 mm. latae, planae, firmae, erectae vel arcuatae, sparse longe pilosae; paniculae 1.5-3 cm. longae, ramis patentibus, gracilibus, paucifloris; spiculae 1-1.2 mm. longae, glabrae, pedicellis longis filiformibus divergentibus; gluma prima 0.5-0.6 mm. longa, acuta, 1-nervis; gluma secunda ca. 0.7 mm. longa, 5-nervis, obtusa; lemma sterile fructum aequans, 5-nerve, obtusum, flore masculo; fructus 0.9 mm. longus, ovatus, acutus, glaber.

Very slender perennial; culms 10-19 cm. high, very densely tufted, erect, usually branching from all but the uppermost nodes, obscured by the many crowded blades; sheaths mostly longer than the internodes, glabrous; ligule membranaceous, about 1 mm. long; blades 0.7-25 mm. long, 0.8-1 mm. wide, flat, firm, erect or becoming arcuate, sparsely long-pilose, with thick white cartilaginous margins; panicles 1.5-3 cm. long, nearly as wide, the slender few-flowered branches spreading; spikelets 1-1.2 mm. long, glabrous, on long filiform divergent pedicels; first glume 0.5-0.6 mm. long, acute, 1-nerved; second glume about 0.7 mm. long, 5-nerved, obtuse; sterile lemma as long as the fruit, 5-nerved, obtuse, enclosing a well developed staminate flower; fruit 0.9 mm. long, ovate, strongly convex, acute, glabrous.

Type in U.S. Nat. Herb., no. 1,911,642, collected in dry rocky open places, Esmeralda Ridge, between Esmeralda and base of Cerro Duida, Territorio Federal Amazonas, alt. 150 m., August 21, 1944, *Julian A. Steyermark 57755.*

Panicum densifolium is similar to *P. obovatum* Doell, which has smaller, sub-spherical, pubescent spikelets 0.8 mm. long, and the second glume and sterile lemma are equal, covering the fruit.

Panicum Mauryi Swallen, nom. nov.

Panicum micranthus var. *hirtum* Maury.

Territorio Federal Amazonas: Sabana Grande, alt. 200 m., *Steyermark 57863*; between Esmeralda Ridge and Sabana de Arboles, alt. 200 m., *57780.*

Panicum pilatum Swallen, sp. nov.

Perenne; culmi dense caespitose, 15-25 cm. alti, erecti, glabri vel internodiis inferioribus dense pilosi; vaginae internodiis longiores, glabrae vel summo marginibus pilosae, ligula ciliata 1.5-2 mm. longa; laminae 3-4 cm. longae, 3-4 mm. latae, lanceolatae, acutae, glabrae vel marginibus basi sparse pilosae; paniculae 3-5 cm. longae, 1-2 cm. latae, ramis adscendentibus, glabris; spiculae 1.6 mm. longae, acutae, nervosae, glabrae, purpurascentes; gluma prima 0.7 mm. longa, angusta, subacuta; gluma secunda et lemma sterile aequalia, fructam aequantia; culmi autumnales ex nodis inferioribus et intermediis sparse ramosi, ramis et laminis paulo reductis.

Culms densely tufted, 15-25 cm. high, erect, glabrous, or sparsely pilose on the lower internodes; sheaths mostly longer than the internodes, glabrous or sparsely pilose on the margins near the summit; ligule ciliate, 1.5-2 mm. long; blades 3-4 cm. long, 3-4 mm. wide, lanceolate, acute, glabrous on both surfaces, the margins sometimes sparsely pilose toward the base; panicles 3-5 cm. long, 1-2 cm. wide, the branches ascending, glabrous; spikelets 1.6 mm. long, acute, strongly nerved, glabrous, tinged with purple; first glume 0.7 mm. long, narrow, subacute; second glume and sterile lemma equal, covering the fruit. Autumnal phase sparingly branching from the lower and middle nodes, the blades and panicles not much reduced.

Type in U.S. Nat. Herb., no. 1,911,673, collected on rocky sandstone summit of eastern peak, Cerro Turumiquire, state of Sucre, alt. 2500 m., May 6, 1945, *Julian A. Steyermark 62606.*

Panicum pilatum belongs in the subgenus *Dicanthelium* and most closely resembles *P. caerulescens* which differs in having subglobose pubescent spikelets and a very short ligule.

Panicum vinaceum Swallen, sp. nov.

Perenne; culmi erecti, 45 cm. alti, infra nodos pilosi adscendentibus; vaginae dense pilosae pilis adscendentibus; ligula ciliata, ca. 0.5 mm. longa; laminae 12-20 cm. longae, 4-7 mm. latae, lineares, acuminatae, adscendentes vel appressae, glabrae vel pilosae pilis divergentibus; panicula 12 cm. longa, 5 cm. lata, ramis solitariis adscendentibus, basi villosis; spiculae 6-6.5 mm. longae, purpurascentes; gluma prima 3 mm. longa, 3-nervis, abrupte acuta; gluma secunda et lemma sterile aequalia, 7-nervia, acuta vel subacuminata; fructus 3 mm. longus, 1.4 mm. latus, glaber, minute striatus.

Perennial; culms stiffly erect, 45 cm. high, ascending-pilose below the nodes, otherwise glabrous; lower sheaths longer, the upper shorter than the internodes, densely ascending pilose, the hairs rather stiff; blades 12-20 cm. long, 4-7 mm. wide, linear, acuminate, narrowly ascending or appressed, stiff, firm, nearly glabrous, or pilose on both surfaces with spreading hairs; panicle 12 cm. long, 5 cm. wide, the few solitary branches narrowly ascending, villous at the base, with a rather large pulvinus in the axils; spikelets 6-6.5 mm. long, purple, mostly in pairs at the ends of the branchlets, obliquely placed on the pedicels, the pedicels of the lateral spikelets short; first glume 3 mm. long, 3-nerved, rather distant, somewhat abruptly acute; second glume and sterile lemma equal, or the glume slightly longer, 7-nerved, acute or subacuminate, gaping; fruit 3 mm. long, 1.4 mm. wide, minutely striate, glabrous, raised on the thickened winged rachilla joint about 0.8 mm. long.

Type in U.S. Nat. Herb., no. 1,911661, collected on Gran Sabana, between Kun and waterfall at Rué-merú (tributary of Río Kukenán), south of Mount Roraima, state of Bolívar, alt. 1065 m., October 2, 1944 *Julian A. Steyermark 59173.*

Panicum vinaceum is related to *P. cervicatum* Chase, which has very large, diffuse panicles as much as 40 cm. long, the branches glabrous or nearly so at the base, and larger spikelets, 7-8 mm. long.

Ichnanthus acuminatus Swallen, sp. nov.

Perennis; culmi robusti, 170 cm. alti, basi decumbentes, infra nodos dense pubescentes; vaginae internodiis longiores summum versus carinata, hirsutae, collo dense pubescentes; ligula membranacea 3 mm. longa; laminae 15-20 cm. longae, usque ad 2 cm. latae, lanceolato-acuminatae, pubescentes vel pilosae; paniculae ca. 30 cm. longae, 10-20 cm. latae, oblongae vel pyramidatae, ramis adscendentibus basi dense pubescentibus vel pilosis; spiculae 3.4-3.5 mm. longae; gluma prima 2-3 mm. longa, acuta vel subacuminata, 3-nervis, carina scabra; gluma secunda et lemma sterile aequalia, 5-nervia, scaberula; fructus 2.8 mm. longus, glaber, alis angustis, obtusis, 0.5-0.7 mm. longis.

Perennial; culms rather coarse, erect from a decumbent base, as much as 170 cm. high, densely pubescent below the nodes; sheaths mostly longer than the internodes, somewhat keeled toward the summit, densely pubescent on the collar, hirsute to nearly glabrous on the back; ligule membranaceous, about 3 mm. long; blades 15-20 cm. long, as much as 2 cm. wide, firm, lanceolate-acuminate, usually pubescent or pilose on both surfaces; panicle about 30 cm. long, 10-20 cm. wide, oblong or pyramidal, the branches verticillate, ascending or the lower spreading, densely pubescent or pilose in the axils; spikelets 3.4-3.5 mm. long, the lateral ones short-pediceled, appressed; first glume 2-3 mm. long, broadly triangular, acute or sub-acuminate, 3-nerved, scabrous on the keel; second glume and sterile lemma equal, sub-acute, 5-nerved, scaberulous; fruit 2.8-3 mm. long, slender, glabrous, the wings 0.5-0.7 mm. long, narrow, rounded above.

Type in U.S. Nat. Herb., no. 1,911,659, collected along stream in Gran Sabana, between Kun and Uaduara-paru, in valley of Río Kukenán, south of Mount Roraima, state of Bolívar, alt. 1065-1220 m., October 1, 1944, *Julian A. Steyermark 59086.* Also collected on Gran Sabana, between Santa Teresita de Kavanayén northwest of Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., *59371*; savanna bordering forest of Río Karuai, between Santa Teresita de Kavanayén and base of Ptari-tepui, state of Bolívar, alt. 1220 m., *60335.*

Ichnanthus acuminatus is related to *I. verticillatus* and *I. ichnodes*, both of which have smaller spikelets; the former has broad thin blades as much as 5 cm. wide, and the latter has narrower elongate blades. True *I. ichnodes* is known only from Trinidad.

Ichnanthus duidensis Swallen, sp. nov.

Annuus; culmi decumbentes, 110 cm. longi, glabri; vaginae carinatae, glabrae, internodiis breviores; ligula membranacea, ca. 0.5

mm. longa; laminae oblongo-lanceolatae, subacuminatae, 20-35 cm. longae, 4-5.5 cm. latae, supra hispidae, superiores basi cordatae, inferiores basi attenuatae; paniculae ca. 25 cm. longae, 15 cm. latae, ramis adscendentibus vel patentibus, inferioribus usque ad 15 cm. longis, spicularum pedicellis divergentibus; spiculae 4.5-5.2 mm. longae, sparse pilosae, usque ad 2 mm. longae; gluma prima 3-4 mm. longa, angusta, 3-nervis; gluma secunda et lemma sterile aequalia, acuta, 3-5-nervia; fructus 4-4.2 mm. longus, ellipticus, glaber, alis duplo brevioribus, minute erosis.

Annual; culms rather stout, semi-decumbent, 110 cm. long, glabrous; sheaths keeled, glabrous, usually shorter than the internodes; ligule membranaceous, less than 0.5 mm. long; blades oblong-lanceolate, 20-35 cm. long, 4-5.5 cm. wide, usually asymmetrical, hispid on the upper surface near the base, otherwise glabrous, rather abruptly narrowed to the sub-acuminate tip, the upper ones narrowed to a rounded or cordate base, the lower narrowed to an elongate base about as wide as the sheath; panicle about 25 cm. long, 15 cm. wide, the branchlets ascending to spreading, the lower as much as 15 cm. long, the branchlets and pedicels divergent; spikelets 4.5-5.2 mm. long, sparsely pilose with hairs as much as 2 mm. long; first glume 3-4 mm. long, narrow, 3-nerved; second glume and sterile glume and sterile lemma equal or nearly so, 3- or weakly 5-nerved, acute; fruit 4-4.2 mm. long, elliptic, glabrous, the wings about half as long, thin, narrow, minutely erose.

Type in U.S. Nat. Herb., no. 1,911,648, collected on Cerro Duida, southeastern-facing slopes along Caño Negro (tributary of Caño Iguapo), Territorio Federal Amazonas, alt. 305-1095 m., August 25-26, 1944, *Julian A. Steyermark 57988.*

Ichnanthus longifolius Swallen, sp. nov.

Perennis; culmi erecti ca. 75 cm. alti, glabri; vaginae internodiis longiores, glabrae, marginibus sparse papilloso-pilosae; ligula ciliata, 1 mm. longa, laminae ca. 65 cm. longae, 11-12 mm. latae, lineares, acuminatae, basi attenuatae, glabrae, marginibus scaberulis, suprema reducta; paniculae ca. 10 cm. longae, 2 cm. latae, ramis adscendentibus; spiculae 3.4-3.6 mm. longae; gluma prima 2.5-3 mm. longa, obtusa, 3-nervis, scabra; gluma secunda et lemma sterile aequalia, obtusa, scabra; fructus 3 mm. longus, acutus, glaber, alis 1 mm. longis, angustis, obtusis.

Perennial; culms about 75 cm. high, erect, glabrous; sheaths, except the upper one, longer than the internodes, glabrous on the back, the margins very sparsely papillose-pilose; ligule ciliate, 1 mm. long; blades mostly about 65 cm. long, 11-12 mm. wide, linear, acuminate, long-attenuate to a narrow base, except for the ligule, not differentiated from the sheath, glabrous, the margins scaberulous, the uppermost blade reduced, about 12 cm. long, not attenuate toward the base; panicle about 10 cm. long (immature), about ? cm. wide, the branches ascending; spikelets 3.4-3.6 mm. long, blunt; first

glume 2.5-3.5 mm. long, usually obtuse, 3-nerved, scabrous; second glume and sterile lemma equal, obtuse, 5-nerved, scabrous; fruit 3 mm. long, acute, glabrous, the wings 1 mm. long, narrow, the tip rounded.

Type in U.S. Nat. Herb., no. 1,911,650, collected on Cerro Duida, southeastern-facing sandstone bluffs near Caño Negro (tributary of Caño Iguapo), Territorio Federal Amazonas, alt. 1095-1520 m., August 26, 1944, *Julian A. Steyermark 58020*.

Related to the proceding, but readily distinguished by the elongate blades, long attenuate to the base.

Ichnanthus serratus Swallen, sp. nov.

Perennis; culmi erecti, 55 cm. alti, scabri; vaginae carinatae, pilosae; ligula ciliata, ca. 1 mm. longa; laminae 30 cm. longae, 4-5 mm. latae, acuminatae, pungentes, basi attenuatae, supra basi sparse pilosae, marginibus scabris, hispidis; paniculae 13 cm. longae, 8 cm. latae, ramis fasciculatis scabris, adscendentibus vel patentibus; spiculae 3-3.2 mm. longae, pedicellis gracilibus appressis; gluma prima 2-2.5 mm. longa, 1-3-nervis, scabra; gluma secunda et lemma sterile aequalia, scabra, subobtusa; fructus 2.8 mm. longus, minute acutus, glaber, lucidus, alis 1.2 mm. longis, hyalinis, angustis, obtusis.

Perennial; culms erect, 55 cm. high, scabrous; leaves mostly crowded toward the base, the culm leaves 2, the upper one much reduced; sheaths keeled, rather densely pilose on the margins, sparsely so on the back; ligule ciliate about 1 mm. long; blades about 30 cm. long, 4-5 mm. wide, thick, firm, erect, long attenuate to a narrow base as wide as the mouth of the sheath, acuminate to a stiff rounded point, sparsely pilose on the upper surface toward the base, otherwise glabrous or nearly so on the surfaces, the margins thickened, scabrous with small irregular antrorsely hispid protuberances; panicle 13 cm. long, about 8 cm. wide, the scabrous branches fascicled, ascending or spreading; spikelets 3-3.2 mm. long on rather long slender appressed pedicels; first glume 2-2.5 mm. long, 1-3-nerved, scabrous; second glume and sterile lemma equal or the glume a little longer, scabrous, subobtuse, tinged with purple; fruit 2.8 mm. long, minutely pointed, glabrous, shining, the wings about 1.2 mm. long, thin, narrow, obtuse.

Type in U.S. Nat. Herb., no. 1,911,653, collected on summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58298*.

This species can be distinguished from all others known by the stiff firm leaves and peculiar serrate margins of the blades.

Arthrostylidium effusum (Hack.) McClure, comb. nov.

Arundinaria effusa Hack. Oestert. Bot. Zeit. **53**: 71. 1903. Brazil. Duplicate of *Glaziou 16627*, and fragment of *Glaziou 17449* from herb. Hack., seen at US. Common on upper steep slopes between 1830 m. and summit, Cerro Duida, *Steyermark 58396*; sterile, no culm sheaths.

Arthrostylidium Steyermarkii McClure, sp. nov.

Rami (floriferi foliiferi tantum adsunt) solitarii, longitudinem usque ca. 1.5 m. attingentes, sublignosi, internodiis glabris, fistulosis, ligno parietario parum crasso, nodis inflatis, glabris. Foliorum vaginae nervis crassis valde striatae, dorso apicem versus plerumque manifeste carinatae, dorso et marginibus glabrae, auriculis obsoletis, setis oralibus crassis, glabris, plerumque paucis, interdum obsoletis, ligula externa (collario) brevi, margine glabra vel subtiliter ciliolata, ligula interna perbrevi, fusca, dorso glabra, apice plerumque concava, margine integra vel erosa vel sublaciniata, petiolo crasso utrinque glabro. Foliorum laminae lanceolatae, alia usque ad 177 cm. longa alia usque ad 38 mm. lata (pleraeque in specimine apice fractae quamobrem incompletae), basi rotundatae vel cuneatae, supra sensim (interdum acuminatim) angustatae, utrinque glabrae vel subglabrae, supra nitidae, subtus pallidiores (subglaucae), marginibus cartilagineae et obsolete serrulatae vel subleves, costa basin laminae versus tantum utrinque straminea, alibi vix manifesta, venis primariis secundariis vix distinguendis, venulis transversis inconspicuis vel rarius conspicuis.

Inflorescentiae paniculae effusae ramos vel ramulos foliiferos terminantes, usque (pedunculo incluso) ad 55 cm. longae, demptis spiculis omnino glabrae, pedunculo usque ad 28.5 cm. longo, rhachi valde angulata vel sulcata, radiis tenuis rigidulis, primariis usque ad 25 cm. longis, basi pulvinatis, pedicellis (radiis ordinis 2-4), 6-60 mm. longis, spiculae fusco-stramineae, lanceolatae, subcompressae, subpatentes, vulgo 1.5-2 cm. longae, 3-5-florae (dempta floscula suprema inchoata). Glumae (vacuae) 2, rarius 3, vulgo approximatae, inaequales, oblongo-ovatae, obtusae, submucronatae, dorso glabrae, marginibus glabrae vel obsolete ciliolatae, I: 1.5-3 mm. longa, 1-3-nervis; II: 2.5-3.5 mm. longa, 3-5-nervis; III: 3-4.5 mm. longa, 5-7-nervis. Lemmata glumae supremae similia sed longiora, basi latiora, et plerumque in zona secus margines scabra, I (interdum vacuum, saepius paleam inchoatam subtendens): 4-5.5 mm.; II: 5-5.5 mm.; III: 5-5.5 mm.; IV: ca. 5 mm.; supremum (flosculam inchoatam subtendens): ca. 4 mm. longum. Palea lemmate suo plerumque longior (saepe in floscula infima et semper in suprema

parum evoluta), oblonga, apice obtusa et late rotundata, dorso 2-carinata et late sulcata, inter carinas dense pubescens, extra carinas praecipue apicem versus pilis subtilibus adpressis dense pubescens, nervis inter carinas solitariis, alibi (demptis carinis) obscuris. Rhachilla segmenta infra lemmata articulata, apice suboblique ubi margine subtiliter ciliolata, idem inter flosculas compressa, clavata, curvata, utrinque pilulis albidis antrorse strigosa vel latere uno glabra alio strigosa, I (infra lemma infimum; parum compressum vel parum sulcatum): 0.5-1 mm.; II: 1.5-2 mm.; III: ca. 2.5 m.; IV: ca.

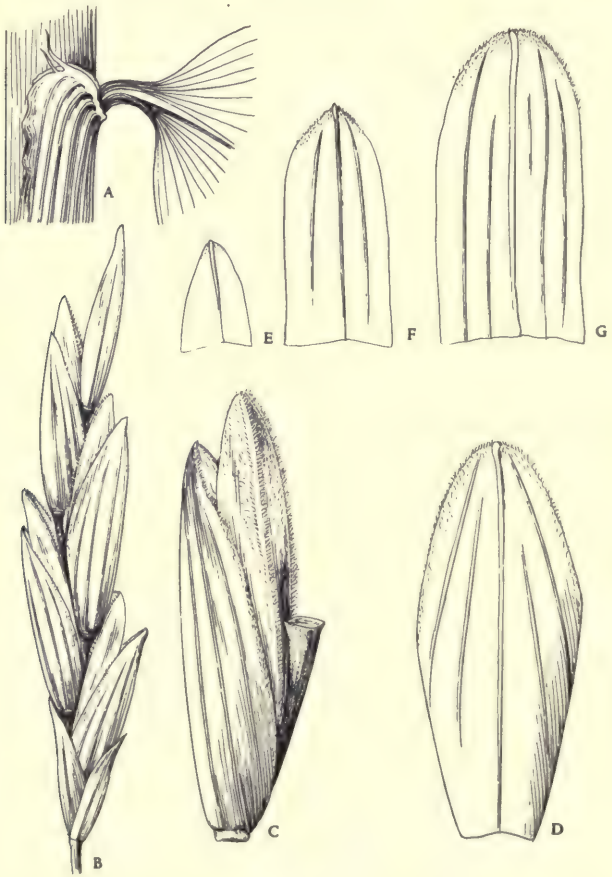

FIGURE 3

Arthrostylidium Steyermarkii McClure, sp. nov. (*Steyermark 59926*)
A, Summit of leaf sheath, X 2.5; B, Spikelet, X 5; C, Floret, X 10; D, Lemma, X 10; E-G, Glumes, I-III, X 10.
The author's pencil sketches were inked by Mrs. Agnes Chase.

3 mm.; V: ca. 3 mm. longum; supremum 3 mm. vel ultra. Lodiculae 3, vulgo badiae et vix translucidae, vix manifeste nervosae, utrinque glabrae, margine ciliatae, anteriores duae usque ad 2 mm. longae, lanceolatae vel subsemiovatae, apice plerumque acutae, posterior 1-1.5 mm. longa, anguste lanceolata, apice acuta. Antherae luteae. Ovarium subgibbose ovoideum vel subfusiforme, fusco-badium, glabrum. Stylus albidus, pubescens. Stigmata levia apice obtusa (forsan in speciminibus nostris imperfecta). Fructus maturus incognitus (Fig. 3).

Type in U.S. Nat. Herb., no. 1,911,667, isotype in herb. Chi. Nat. Hist. Mus., no. 1,189,856, collected in open places at base of east-facing high sandstone bluffs on Ptari-tepuí, state of Bolívar, November 7, 1944, *Julian A. Steyermark 59926*, "forming dense thickets"; all specimens in a flowering state, culm sheaths lacking. *Steyermark 59927* (same place and date), sterile only, culm sheaths lacking, "in dense thickets in more shaded places than *59926*" is believed to be conspecific.

The flowering specimens of this species resemble those of *Arthrostylidium amplissimum* (Nees) McClure[5] in general appearance, but, on closer comparison, the new species is seen to differ in the following respects: smaller leaf blades, longer spikelets and longer florets: glumes obtuse; lemmas broadly rounded at the apex, ciliate on the margins and somewhat pubescent or scabrous near the margins; paleas more prominently exserted and more prominently pubescent.

[5] **Arthrostylidium amplissimum** (Nees) McClure, comb. nov.

Arundinaria amplissima Nees, Linnaea 9: 479. 1834. Brazil. *Sellow 875*. Type in Berlin; isotype, with the name inscribed in Nees' hand, seen at U.S. Nat. Herb.

Myriocladus Swallen, gen. nov.

Spiculae alternae, in racemis unilateralibus dispositae, 4-florae, flosculo infimo abortivo, supremo reducto; rhachilla inter flosculum abortivum et flosculum primum hermaphroditum articulata; glumae et lemma sterile spicula breviora, 1-nervis, breve aristata; flosculorum hermaphroditum lemma coriaceum, obscure 5-7-nerve, exaristatum; palea sulcata, marginibus latis hyalinis; gramen perenne (?), laminis elongatis, latis, subcordatis, basi vix articulatis, racemis numerosis paniculatis.

Spikelets alternate on one side of an angled rachis, 4-flowered, the lowest lemma empty, the uppermost floret rudimentary, the rachilla readily disarticulating between the sterile and fertile florets, the two fertile florets and the rudiment falling entire; glumes and sterile lemma shorter than the spikelet, 1-nerved, awned; fertile lemmas coriaceous, weakly 5-7-nerved, awnless; palea deeply sulcate, the margins broad, thin, overlapping; perennial grass with long broad flat blades, gradually narrowed to a broad subcordate base, plainly differentiated from the sheath, probably tardily disarticulating, and elongate panicles of numerous racemes.

Myriocladus resembles, and is probably closely related, to *Neurolepis* which differs in having two sterile lemmas, only one perfect floret, no rudiment, and the blades are long attenuate to the base and continuous with the sheath without any definite line of separation.

Myriocladus virgatus Swallen, sp. nov.

Culmi 1.5 m. alti, robusti, erecti, glabri, panicula folio multo superante; vaginae latae, internodiis brevibus multo longiores, compressae, glabrae; ligula ca. 1 mm. longa, minute ciliata; laminae 35-55 cm. longae, 1.5-4.0 cm. latae, lineari-lanceolatae, subcordatae, firmae, glabrae, marginibus valde scabris; panicula 85 cm. longa, racemis ± 200, brevibus, adscendentibus vel patentibus, axe crasso pubescenti; spiculae 3 mm. longae; gluma prima 1.5 mm. longa, arista 0.5 mm. longa; gluma secunda obovata, 1.5 mm. longa, arista glumam aequante; lemma sterile obtusum, 2 mm. longum, arista quam gluma duplo breviore; floris inferioris hermaphroditi lemma 3 mm. longum, 5-7-nerve, glabrum; palea lemma aequans, sulcata, carinata, marginibus latis hyalinis.

Culms 1.5 m. high, robust, stiffly erect, somewhat compressed, glabrous, the elongate inflorescence much exceeding the leaves, these mostly crowded toward the base; sheaths broad, all much longer than the short internodes, somewhat compressed but not keeled, more or less inflated, glabrous, the juncture with the blade marked by a well defined line or ridge but the blades not readily deciduous; ligule about 0.1 mm. longi minutely ciliate; blade 35-55 cm. long, 1.5-4.0 cm. wide, linear-lanceolate, somewhat cordate, the base about as wide as the mouth of the sheath, firm, flat, glabrous, the margins strongly scabrous; inflorescence about 85 cm. long with approximately 200 short ascending to spreading racemes, these paniculate on the

stout pubescent axis; racemes mostly 2-2.5 cm. long, subsessile, with a prominent pubescent pulvinus in the axils, the lower ones rather distant, often with poorly developed spikelets, the upper ones crowded; spikelets 3 mm. long; first glume 1.5 mm. long, narrow, the awn about 0.5 mm. long; second glume obovate, 1.5 mm. long with a stout awn as long as the body; sterile lemma obtuse, 2 mm. long, the awn 1/2 as long as the body; lower floret 3 mm. long, the lemma faintly 5-7-nerved, smooth, awnless; palea as long as or a little longer than the lemma, rather deeply sulcate, sharply keeled, the margins broad, thin, overlapping, enclosing the flower; rudiment 1.5 mm. long (Fig. 4).

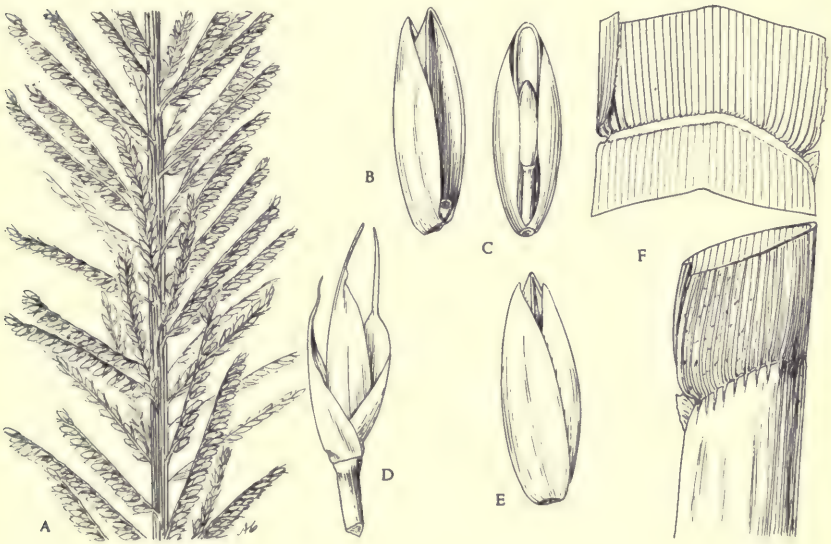

FIGURE 4

Myriocladus virgatus Swallen, sp. nov. (*Steyermark 58293*)
A, Inflorescence X 1: B, Lower fertile floret, X 10; C, Upper fertile floret with rudiment, X 10: D, Glumes and sterile lemma, X 10; E, Spikelet with glumes and sterile lemma removed, X 10; F, Ligule and upper part of sheath, X 1

Type in herb. Chi. Nat. Hist. Mus., no. 1,189,825, collected on summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58293.*

Myriocladus Cardonae Swallen, sp. nov.

Perennis; culmi usque ad 3 m. alti, ramosi, ca. 1 cm. crassi; vaginae condensatae, distichae, crassae, glabrae, summo ligula

exteriore brevi membranacea; ligula ex pilis longis implicatis, in ore vaginarum inferiorum conspicuis, constituta; laminae articulatae, inferiores suque ad 34 cm. longae, 5.5 cm. latae, acuminatae, tessellatae, glabrae, marginibus scaberrimis, eae ramorum minores, 6-14 cm. longae, 2-2.5 cm. latae; inflorescentiae 10-30 cm. longae, 1-1.5 cm. latae, densae, attenuatae, racemis brevibus, condensatis, appressis, axe dense pubescente; glumae floribus fere longiores, secunda quam prima longior, acuminatae, in parte superiore marginibus involutis; lemma sterile 3 mm. longum, obtusum, apiculatum; lemmata fertilia 3.5 mm. longa, obtusa, glabra; palea quam lemmate 0.5-1.0 mm. longior, inter carinas sulcata; flos supremus reductus obsoletus, rachilla manifesta.

Perennial; culms woody, branching and rebranching, apparently from the lower nodes, the main culm as much as 3 m. tall, about 1 cm. thick; sheaths very crowded, distichous, the back thickened, becoming spongy and fibrous with age, glabrous, extending beyond the articulation with the blade as a short membrane; ligule a dense line of long tangled hairs, the lateral hairs conspicuous at mouth of the sheath; lower blades as much as 34 cm. long, 5.5 cm. wide, acuminate, rather broadly rounded at the base, tessellate, glabrous on both surfaces, the margins strongly scabrous, disarticulating from the sheath with age, the blades of the branches much smaller, 6-14 cm. long, 2-2.5 cm. wide; inflorescences terminal on all the branches, 10-30 cm. long, 1-1.5 cm. wide, dense, spikelike, attenuate toward the tip, the short crowded racemes closely appressed, the axis densely pubescent; spikelets 5-7 mm. long; glumes about equaling or exceeding the florets, the second longer than the first, broad at the base, acuminate, the margins inrolled from the middle upward, the tip thus appearing as a stout awn; sterile lemma 3 mm. long, obtuse, apiculate; fertile lemma 3.5 mm. long, obtuse, glabrous, the midnerve thickened toward the tip but not excurrent; palea 0.5-1.0 mm. longer than the lemma, deeply sulcate; upper rudimentary floret reduced to the rachilla joint.

Type in U.S. Nat. Herb., nos. 1,914,812-4, collected on Cumbre del Cerro Acopán, Caroní, Guayana, alt. 2150 m., October, 1947, *Felix Cardona 2307.*

CYPERACEAE

Tribe CYPEREAE

Bulbostylis junciformis var. **ambigua** (Nees) Steyermark, comb. nov.

Isolepis ambigua Nees, in Herb. Lindl. et in Linn. IX: 291. 1834; Kunth, Enum. II: 219. 1837; *Isolepis junciformis* β Kunth, Enum. II. l.c.

This variety is distinguished by its shorter leaves and culms, even shorter than in the following var. *congesta*, the culms "semipedali aut breviori", and in the simple terminal head of flowers. The leaves are noticeably more scabrid-ciliate on the margins than in any of the other varieties. Dry sandy upland, Gran Sabana, between waterfall at Rué-merú and Divina Pastora on Río Kukenán north of Santa Elena, south of Mount Roraima, state of Bolívar, alt. 1065 m., *Steyermark 59207.*

Bulbostylis junciformis var. **congesta** (Schrad.) Steyermark, comb. nov.

Scirpus congestus Reichenb. in Weigelt. Herb. Surinam; *Isolepis congesta* Schrad. in Schult. Mant. II: 70. 1822; Kunth, Enum. II: 218. 1837; *Oncostylis junciformis δ congesta* Nees, in Mart. Fl. Bras. **21**: 86. 1842.

This variety may be distinguished by the shorter culms, the shorter leaves which are about half the length of the culm, and by the more contracted umbels on fewer and shorter rays. Gran Sabana, between Kun and Uaduara-paru, in valley of Río Kukenán, south of Mount Roraima, state of Bolívar, alt. 1065-1220 m., *Steyermark 59080.*

Bulbostylis Svensoniana Steyermark, sp. nov.

Perennis; culmis caespitosis angulosis striatis glabris, 5-5.5 dm. altis, 1.25-1.5 mm. latis, basi foliatis; foliis filiformi-setaceis erectis vel curvatis, supra glabris vel glabratis, infra pilosis, 10-25 cm. longis, 0.5 mm. latis, culmo brevioribus; vaginis ore dorsoque sericeo-lanatis; involucro 5-6-phyllo setaceo scabridulo, 2.5-5 cm. longo, 0.5 mm. lato quam umbella breviore vel aequali; capitulis elongatis polystachyis; spicis oblongo-lanceolatis acutis, 3.5 mm. longis; squamis ovatis acutis, 2.25-2.5 mm. longis; stylo 3-fido; achaenio trigono obovoideo, 0.6-0.8 mm. longo, subtilissime punctulato.

Inflorescence many-rayed, 5-8 cm. long, 1-2.5 cm. wide, the rays erect-ascending; spikelets densely clustered or fascicled, terminating many branches, about 4-flowered; scales 7-8, lower empty, castaneous or ferruginous-brown, ovate, acute or shortly aristate with exserted midrib, glabrous or very minutely ciliolate on margins; achene buff or pale greenish-white, about 1 mm. wide around summit. (Fig. 5, a).

Type in herb. Chi. Nat. Hist. Mus., collected on dry flat savanna with *Curatella*, between Upata and Río Caroní, state of Bolívar, alt.

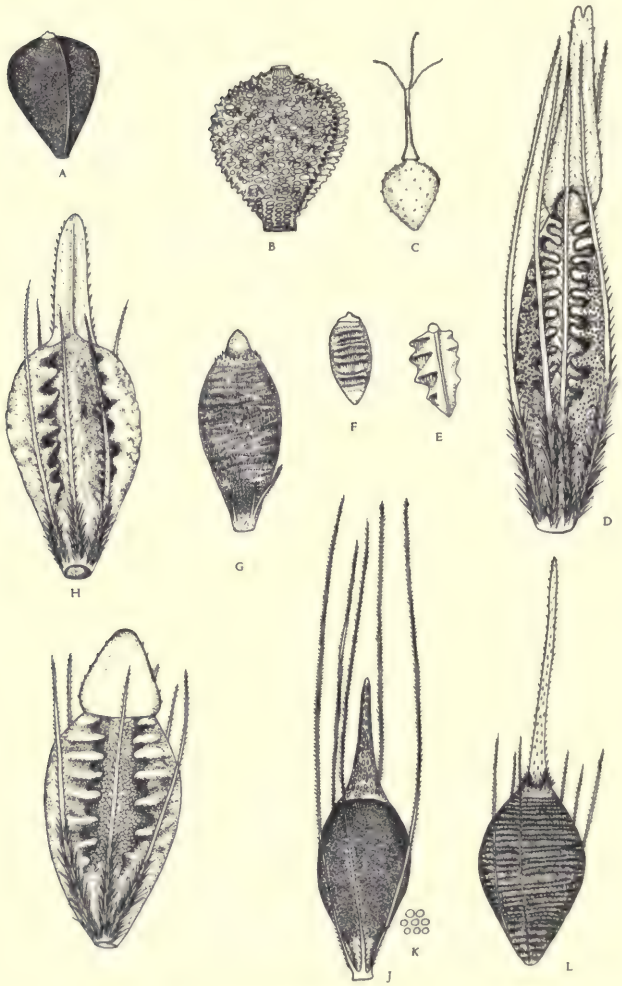

FIGURE 5

A, *Bulbostylis Svensoniana*. Achene (X 17); B, *Fimbristylis tamaensis*. Achene (X 18); C, *Fimbristylis tamaensis*. Achene with style still attached (X 8); D, *Rhynchospora dentinux*. Achene (X 13); E, *Rhynchospora sanariapensis*. Achene, lateral view (X 12); F, *Rhynchospora sanariapensis*. Achene, face view (X 12); G, *Rhynchospora tepuiana*. Achene (X 15); H, *Rhynchospora Trichochaeta* var. *venezuelensis*. Achene (X 10); I, *Rhynchospora Trichochaeta*. Achene (X 10); J, *Rhynchospora bolivarana*. Achene (X 8); K, *Rhynchospora bolivarana*. Surface of achene highly magnified; L, *Rhynchospora karuaiana*. Achene (X 5);

400 m., August 2, 1944, *Julian A. Steyermark 57629.*

In some respects this presents an intermediate position between *B. junciformis* with its many-flowered inflorescence and some of the monocephalous species having dense hairiness around the orifice of the leaves at the base of the culms. In a note received from Dr. Svenson, regarding his opinion of the species, he writes as follows: "This is close in appearance to *B. papillosa* Kükenthal, but I think it is a distinct species, differing from *B. papillosa* in the fuzzy culm bases, pale spikelets, and especially in the nearly smooth, small pale achenes (0.6 mm. long), approximately half the size of those of *B. papillosa.* It is probably the same as *Pittier 9009* (except in fuzzy base) from vicinity of Valencia, Carabobo, alt. 400-800 m., which is noted by N. E. Brown as 'not matched at Kew'."

Fimbristylis tamaensis Steyermark, sp. nov.

Culmi compressi, marginibus scabridulis, 40-55 cm. alti, 2-3 mm. lati, basi foliati; foliis basalibus planis, marginibus scabris, 30 cm. longis, 3-3.5 mm. latis, culmo brevioribus; involucro 1-2 umbella breviore, 3.5-5 cm. longo; umbella composita pluriradiata; spicis pluribus ovato-vel oblongo-lanceolatis, 4-4.5 mm. longis, 1.25-1.5 mm. latis; squamis castaneis ovatis, 1.5-2.25 mm. longis, carina pallida breviter excurrente; stylo 3-fido; achaenio pallido vel stramineo, trigono obovoideo, transversim lineato-reticulato, tuberculis prominentibus, 0.75-1 mm. longo, 1.25-1.5 mm. lato.

Culms thickened at margins, ancipital, slightly winged; leaves thickened on the margins, linear, subacute or obtusish; bracts of involucre 1.75-2 mm. wide; umbel with usually 3-4 longer rays with a few shorter ones at base, 7.5-8 cm. long, 3-3.5 cm. wide; spikelets numerous, 50-100 in an inflorescence; scales chestnut-brown with narrow pale hyaline margins, about 10-11 to a spikelet, all the flowers fertile (Fig. 5, b, c).

Type in herb. Chi. Nat. Hist. Mus., collected between Las Delicias and Paraguita, along Río Táchira, by Colombian-Venezuelan boundary, state of Táchira, alt. 1675-1980 m., July 17, 1944, *Julian A. Steyermark 57422.*

This species is at once distinguished by its tuberculate achene, and is further well-marked by its relatively broad, flattened, ancipital culm and 3-fid style. It is apparently related to *F. tenuis* and *F. autumnalis*, which have only reticulate and not tuberculate achenes.

Tribe RHYNCHOSPOREAE

Rhynchospora aristata Boeckeler

Rhynchospora immensa Kük. Engl. Bot. Jahrb. **56**: Beibl. **125**: 17-18. 1921.

Forested southwest-facing quebrada near Rondón Camp, Mount Roraima, state of Bolívar, alt. 2040 m., *Steyermark 58665.* This

plant matches Kükenthal's description of *R. immensa*, based on *Ule 8541* from the forests of Mount Roraima at an elevation of 1400 meters. The present collection was taken at 2040 meters near the base of the high line of sandstone bluffs. Apparently *R. immensa* is synonymous with *R. aristata*, since the two do not appear to be separable.

Since the leaves of *R. immensa* were not adequately described in the original description, an emended description of them, based upon *Steyermark 58665* is given: culmus 1 m. altus, foliatus; foliis anguste lineari-lanceolatis; vaginis 8-8.5 cm. longis, 8 mm. latis, glabris praeter pilos adpressos paucos prope ore concavo.

Rhynchospora bolivarana Steyermark, sp. nov.

Perennis caespitosa; culmis 30-35 cm. altis; foliis marginibus scabris, 15-30 cm. longis, 1.7-2 cm. latis; corymbis 2-3 axillaribus terminalibusque, 1.5-2 cm. longis, 1.2-5 cm. latis; pedunculis tenuibus, 2-5.5 cm. longis; spiculis 3-6, fusiformi-lanceolatis, 1 cm. longis, 2 mm. latis, 6-floris, 6-carpis; squamis ovatis vel lanceolatis breve aristatis pallido-stramineis; setis 6 antrorse hispidulis, fructu longioribus 7-8 mm. longis; achaenio obovoideo longe stipitato, 2.25-2.5 mm. longo, 1 mm. lato, subtilissime puncticulato; tuberculo anguste conico, 1.5 mm. longo, glabro foveolato; stylo bifido, ramis brevibus.

Leaves plane, crowded at base of culm; bracts foliaceous, the lowest up to 15 cm. long, the uppermost 2-10 cm. long, equaling or exceeding the inflorescence; spikelets with 10 scales; lowest scales ovate, the upper lanceolate to oblong-lanceolate, 4-8 mm. long; stipitate part of achene 0.6-1 mm. long, stramineous or pale brown on body of achene, superficially marked with numerous, small, subquadrate puncticulations; beak long-conic, 2/3 width of achene, conspicuously foveolate with rather large, elongate foveolae; short branches of style shorter than or equaling the style proper (Fig. 5, j, k).

Type in herb. Chi. Nat. Hist. Mus., collected by edge of waterfall, Salto de Iwaracaru-merú, at western end of Sororopán-tepuí, state of Bolívar, alt. 1615 m., November 15, 1944, *Julian A. Steyermark 60206*. Also collected along rocky stream bank, Ptari-tepuí, of forested slopes along fast-running stream of "Large Lunch River" below "Misia Kathy Camp", alt. 1500 m., October 27, 1944, *Steyermark 59448*.

This is a member of Series *Diplostyleae*, Div. *Eu-Rhynchospora*, Sect. *Fuscae* (as defined by Clarke), and is probably most closely related to *R. comata* Schultes. It is characterized by the pale buff 10- or more-scaled spikelets in 2-3 slender-peduncled inflorescences, long-stipitate achenes, the elongate bristles greatly surpassing the achene, and the slender, glabrous, tufted leaves.

Rhynchospora culmenicola Steyermark, sp. nov.

Perennis caespitosa; culmis supra foliatis, 25-30 cm. altis, 0.75-1 mm. latis; foliis erecto-adscendentibus, supra aggregatis, infra fere glabris vel parce adpresso-pilosulis, supra magis pubescentibus, pilis minutis adpressis, marginibus incurvatis, costa manifesta carinata; vaginis puberulis vel glabrescentibus; paniculis 4-8, laxe racemosis, 0.5-1.5 cm. longis, axillaribus terminalibusque; pedunculis filiformibus flexuosis, 3.5-5 cm. longis, 1.5-4.5 cm. longis; spiculis 1-3 fusiformi-ellipticis, 5.5-6 mm. longis, 1-1.2 mm. latis, 2-floris, 2-carpis, subsessilibus, pedicellis glabris, 0.5-1.5 mm. longis; squamis ovatis vel ovato-lanceolatis breve aristatis castaneis; setis nullis vel 2-3 rudimentariis; achaenio subrhomboideo-oblongo, 1 mm. longo, subtilissime areolato, transversim striolulato stramineo; tuberculo triangulari-lanceolato, fructu longiore 1.6 mm. longo; stylo ramis brevibus.

Leaves more prominently pubescent with minute appressed hairs on upper surface, these lying on surface enclosed by incurved margins, midrib prominent and keeled on one side, 12-15 cm. long, 1-1.5 mm. wide; panicles loosely racemosely scattered in the upper half of the culm; uppermost bract exceeding inflorescence; spikelets with 5-6 scales; scales 1-6 mm. long; bristles none, or 2-3 short processes at very base of achene with or without serrulations; achene biconvex, stramineous, abruptly narrowed below, rounded or subtruncate above, finely and shallowly areolate with transverse reticulations, the cells broader than high (Fig. 6, b).

Type in herb. Chi. Nat. Hist. Mus., collected around summit of Cerro Negro, above La Sabana de las Piedras, northwest of Caripe, state of Monagas, alt. 2180 m., April 15, 1945, *Julian A. Steyermark 62110*. Also collected in shady, moist, bamboo thickets, Cerro Turumiquire, between headwaters of Río Colorado and summit of southern peak, state of Sucre, alt. 2200-2400 m., May 7, 1945, *Steyermark 62635*.

This species belongs to Series *Haplostyleae*, Div. *Calyptrostylis*, Sect. *Racemosae* (following Clark's divisions). It is related to *R. cryptantha* C. B. Clarke, *R. Edwalliana* Boeckl., *R. racemosa* C., Wright, *R. elongata* Boeckl., *R. Lechleri* Steud., *R. uniflora* Boeckl., and *R. Gollmeri* Boeckl. From all of these it differs in its combination of the following characters: ferruginous or castaneous spikelets, relatively smooth achenes, long beak, no setae or with 2-3 rudiments, foliose culms 30 cm. or less tall, several sparsely simple racemose inflorescences, glabrous pedicels, elongate flexuous peduncles, leaves 1-1.5 mm. wide, and appressed-pilosulous blades and sheaths.

Rhynchospora dentinux C. B. Clarke

Open savanna and igneous rock outcrops, Puerto Ayacucho, Territorio Federal Amazonas, alt. 200 m., *Steyermark 58512*. This is apparently the first recorded collection of the species since its

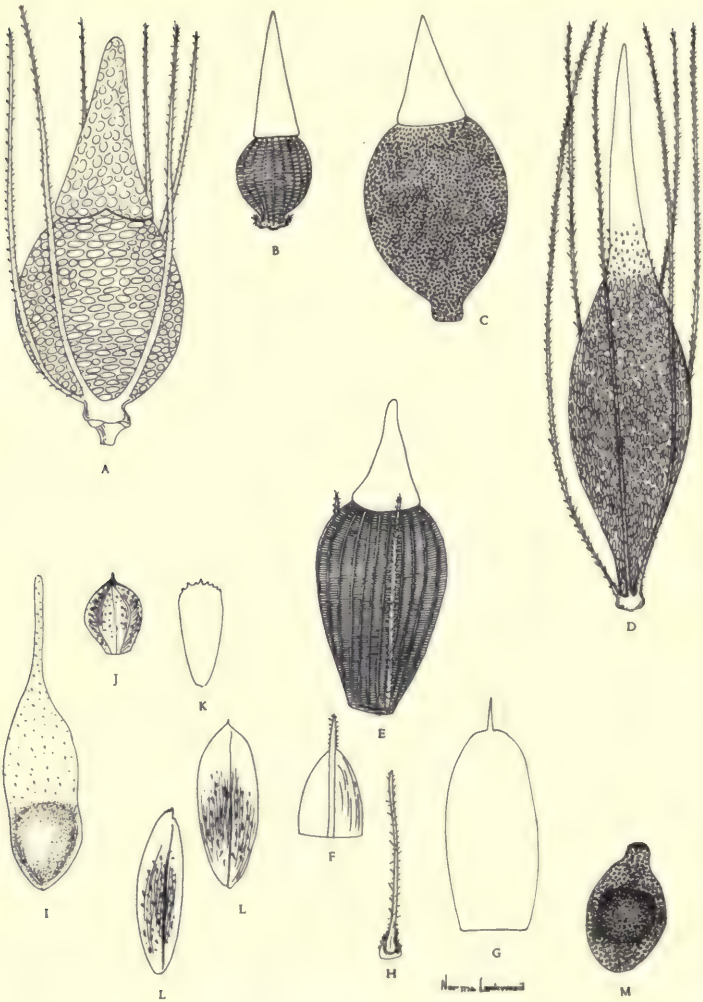

FIGURE 6

A, *Rhynchospora ptaritepuiana*. Achene (X 5); B, *Rhynchospora culmenicola*. Achene (X 17); C, *Rhynchospora paramora*. Achene (X 9); D, *Rhynchospora tamana*. Achene (X 12); E, *Rhynchospora tomentosa*. Achene (X 13); F, *Rhynchospora tomentosa*. Lower scale (X 5); G, *Rhynchospora tomentosa*. Upper scale (X 5); H, *Rhynchospora tomentosa*. Lowest scale (X 2); I, *Hypolytrum tepuianum*. Achene (X 8); J, *Hypolytrum tepuianum*. Scale (X 3); K, *Hypolytrum tepuianum*. Floral glume (X 2); L, *Hypolytrum tepuianum*. Floral glumes (X 4); M, *Exochogyne Steyermarkii*. Achene (X 6);

original publication by Clarke[6], who based his description on *Spruce 3614* from "Maypures; in Upper Orinoco", a locality on the Colombian side just south of the present collection, which is the first record for Venezuela.

Clarke's original description of the achene as "levi, papillosa, fusca" is both inadequate and misleading, especially as regards the use of the word "levi". The rows of tooth-like projections or papillae on one face certainly belie this part of Clark's description. As far as the achene is concerned, this species is one of the most distinct in the entire genus. There is no doubt, however, what Clarke had in mind about the peculiar markings, since, near the end of his description, he states that the achene is "praesertim in parte superiore a papillis erecta ornata. Ceteroquin fere ut *R. Trichochaeta*". Both *R. Trichochaeta* and the Mexican *R. mexicana* have markings on the achene similar to those found in *R. dentinux.*

The following is a description of the achene based on the present collection: body blackish, 3 mm. long, both surfaces minutely granulose-puncticulate, but marked on the inner surface with 2 rows of 10-12 ridges and depressions, the ridges curved, a longitudinal ridge running down the center between these ridges; beak prominent, tawny, bidentate, 2 mm. long, 0.5 mm. wide, antrorsely setulose; awns 5-6, buff-tawny, antrorsely scabrous, surrounded at base by 5 buff-stramineous tufts of hispidulous hairs, 4.5-5 mm. long (Fig. 5, d).

Rhynchospora duidae Steyermark, sp. nov.

Perennis caespitosa; foliis 15-50 cm. longis, 6-7 mm. latis, planis laevibus, marginibus serratis; culmis erectis trigonis laevibus, 6-7 dm. altis; corymbis pallido-stramineis axillaribus terminalibusque contractis, 2-2.5 cm. longis, 1-2.5 cm. latis; involucri bracteis 1-2, 2-3 cm. longis, 1.5-2 mm. latis; spiculis lanceolatis (immaturis) 6.5 mm. longis, 3-4-carpis; setis 6 antrorse hispidulis, 4.5-5 mm. longis (immaturis ?); stylo profunde diviso, ramis longis; tuberculo lanceolato.

Type in herb. Chi. Nat. Hist. Mus., collected on summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1065-1220 m., September 2, 1944, *Julian A. Steyermark 58254.*

Rhynchospora karuaiana Steyermark, sp. nov.

Perennis; culmis trigonis glabris, foliis excedentibus, 10.5 dm. altis vel altioribus; foliis paucis glabris, 60-70 cm. longis, 2.5-3.5 mm. latis; fasciculis 4, subcapitatis, remotis longe-pedunculatis axillaribus terminalibusque, 1-2 cm. longis, 1.5-2 cm. latis; pedunculis usque ad 7.5 cm. longis; bracteis infimis erectis scabridulis, 10 cm. longis, 1-2 mm. latis; spiculis 3-6 lanceolato-ellipticis,

[6]Clarke, C. B. New Gen. & Sp. Cyp., Kew Bull. Add. Ser. VIII: 33. 1908.

7.5-9 mm. longis, 1.5 mm. latis, 2-floris, 1-carpis; squamis ovatis vel oblongo-lanceolatis, breve mucronatis vel aristatis, pallide brunneis; setis 6, antrorse hispidulis, fructu longioribus, 5.5-6 mm. longis; achaenio elliptico-ovato, 4 mm. longo, 2 mm. lato, manifeste transversim profunde sulcato; tuberculo tenui quam achaenio longiore, 5.5-5.75 mm. longo, antrorse hispidulo; stylo parce vel non diviso.

Leaves mostly at base, 2-3 on culm, canaliculate above, midrib prominent below, gradually passing into the glabrous, striatulate, pale hyaline-margined sheath; inflorescence elongated, 13-18 cm. long; peduncles erect, slender, the lowest more elongated; spikelets with 4 scales; scales 3-8 mm. long, pale or ashy brown; achene fulvous-brown, conspicuously transversely wrinkled with deep sulcations, these connected by vertical striations; beak slender elongated, with longer hairs at base and at apex of achene, dark brown (Fig. 5, 1).

Type in herb. Chi. Nat. Hist. Mus., collected by fast water, bordering forest of Río Karuai, between Santa Teresita de Kavanayén and base of Ptari-tepuí, state of Bolívar, alt. 1220 m., November 18, 1944, *Julian A. Steyermark 60334.*

Related to *R. amazonica* Poepp. & Kunth, from which it may be distinguished by the transversely wrinkled achene, more elongated inflorescence, less foliose and less conspicuous bracts, taller, less leafy glabrous culms, and glabrous leaves. From *R. corymbosa* (L.) Hitchc. it differs in the color of the spikelets, different type of inflorescence, and less leafy development of bracts and leaves. From *R. viridi-lutea* C. B. Clarke of British Guiana it differs in the type of inflorescence, color of spikelets, markings of achene, and width of leaves. Finally, from *R. trispicata* Steud. it is distinguished by its less branched inflorescence, more fasciculate heads of spikelets, and different achene.

Rhynchospora paramora Steyermark, sp. nov.

Perennis caespitosa; culmis foliatis glabris, 27-45 cm. altis, 1.5 mm. latis; foliis planis glabris culmo brevioribus, 12-20 cm. longis, 1.5-2.5 mm. latis; paniculis 3-4 subfasciculatis, 1-1.5 cm. longis, 0.5-1 cm. latis, axillaribus terminalibusque; pedunculis tenuibus, 2.5-4.5 cm. longis; bracteis 8-15 cm. longis, inferioribus foliaceis, inflorescentiam excedentibus; spiculis anguste fusiformibus, 7.5-8 mm. longis, 1 mm. latis, 1-carpis; squamis ovatis vel lanceolatis, breve vel manifeste aristatis, castaneis vel brunneis; setis nullis; achaenio ovoideo, 2.1-2.5 mm. longo, 1.8 mm. lato, fere laevi subtilissime puncticulato, pallide stramineo; tuberculo conico-triangulari, 1.1 mm. longo, superficie squamosa; stylo indiviso.

Cespitose perennial with thick, scaly, stoloniferous off-shoots; culms striatulate; panicles dense; spikelets mostly 3-4 in a cluster, with 5-6 scales; achenes buff to stramineous; tubercle about 1/2

width of achene, the surface whitish crustaceous-squamose, these scales deciduous in age (Fig. 6, c).

Type in herb. Chi. Nat. Hist. Mus., collected on Páramo de los Colorados, between El Molino and San Isidro Alto, state of Merída, alt. 2745-2955 m., May 14, 1944, *Julian A. Steyermark 56550.*

From *R. racemosa* C. Wright, which it resembles, this species differs in the subfasciculate instead of racemose inflorescences, and paler, less rugulose achenes with smaller superficial cells. From *R. cryptantha* C. B. Clarke it may be distinguished by the less foliose culms, different type of inflorescence, which is not concealed among the leaves or bracts.

Rhynchospora ptaritepuiana Steyermark, sp. nov.

Perennis; culmis infra foliatis, 6-7 dm. altis; foliis erectis, supra glabris, infra costa glabra vel breve pilosa, aliter glabris, 25-45 cm. longis, 3-3.5 mm. latis; paniculis 2-6, brevibus, 2-4 cm. longis, 1.5-3.5 cm. latis, axillaribus terminalibusque; pedunculis tenuibus, 3.5-8.5 cm. longis; bracteis infimis foliaceis, usque ad 17 cm. longis; spiculis fusiformi-ellipticis, 4.5-5 mm. longis, 1.5 mm. latis, 5-floris, 5-carpis; squamis ovatis breviter aristatis vel mucronatis ferrugineis; setis 6, antrorse hispidulis, quam tuberculo aequantibus vel longioribus, 2-2.2 mm. longis; achaenio ovoideo, basi substipitato, superne rotundato, 1.5 mm. longo, 1 mm. lato, nitido, subtilissime puncticulato; tuberculo late conico, basi bilobato, 1.1-1.2 mm. longo, glabro; stylo indiviso vel parce diviso.

Culms glabrous, usually taller than the leaves; spikelets with 7-9 scales, on short pedicels 1.5 mm. long; scales glabrous, the lower short-aristate, the upper aristate or merely acute and mucronate, ferruginous; achene abruptly narrowed to a substipitate base 0.3 mm. long, rounded above, rufous- or dark brown, shining and appearing smooth, but the surface superficially cellular with reticulations broader than high; tubercle about 3/4 width of achene, loosely cellular with depressed cells (Fig. 6, a).

Type in herb. Chi. Nat. Hist. Mus., collected on dripping sandstone bluffs, Ptari-tepuí, at base of first line of bluffs, on south-facing part, east of "Cave Rock", state of Bolívar, alt. 2130 m., November 4, 1944, *Julian A. Steyermark 59830.* Also collected on moist bluff, Ptari-tepuí, at base of and on main south-facing high sandstone bluffs, alt. 2400-2410 m., October 30, 1944, *Steyermark 59599.*

A member of Series *Haplostyleae*, Div. *Calyptrostylis*, Sect. *Paniculatae* (following Clarke's subdivisions), this species is apparently related to *R. polyphylla* Vahl, from which it differs in the more elongated, erect, narrower leaves, which are more crowded towards the base of the culm and not so uniformly scattered along the length of the culm, in the shorter inflorescences of brown spikelets,

and the longer-beaked, larger, and more shining achenes which are less prominently reticulate with cells broader than high, while from *R. Lechleri* Steud. of Peru it differs in the broader leaves which are not scabrid-serrulate on margins, and in various floral characters.

The distinguishing characteristics of *R. ptaritepuiana* are the elongate, narrow leaves, clustered more at the base of the culm, and not conspicuously scattered on the culm, the short brown panicles, the shining achene marked with transversely broader than high superficial cells, the elongate bilobed tubercle, and the 6 bristles which equal or are longer than the achene.

Rhynchospora sanariapensis Steyermark, sp. nov.

Annua caespitosa; foliis setaceis, glabris, 2.5-5 cm. longis; culmis filiformi-setaceis, glabris, 7-10 cm. altis; corymbis terminalibus, glomerulis, 8-12 mm. altis, 5-12 mm. latis; floribus 6 vel pluribus; spiculis lanceolato-subulatis, 2-floris, 1-carpis, 3-3.5 mm. longis; squamis 4, ovatis vel lanceolatis, acutis; stylo diviso; setis nullis; achaenio oblongo-obovoideo, 0.9-1 mm. longo, 0.5 mm. lato, transversim profunde 4-5-sulcato et prominente gibbo elevato, inter gibbo subtilissime longitudinaliter striato; tuberculo breve depresso, 0.05-0.1 mm. alto.

Corymbs with central cluster subsessile, the 2 lateral clusters with 6 or more spikelets; bract shorter or longer than corymbs, 1-1.6 cm. long, scabridulous on margins; lower scales 0.5-1.5 mm. long, the upper 2.25-3.5 mm. long; style divided into 2 slender branches; achene somewhat narrowed below, rounded or subtruncate above, tawny-brown, each face deeply 4-5 transversely sulcate with prominent subacutely angled ridges with fine striae running lengthwise between the ridges, narrowly ridged lengthwise on each side (Fig. 5, e, f).

Type in herb. Chi. Nat. Hist. Mus., collected in vicinity of Sanariapo, near Río Sanariapo, tributary of Orinoco river, Territorio Federal Amazonas, alt. 100 m., September 8, 1944, *Julian A. Steyermark 58469.* Also collected among rock outcrops below mouth of Río Sanariapo, along Orinoco river, alt. 100 m., September 8, 1944, *Steyermark 58436.*

Related to *R. pluricarpa* Gilg of the Matto Grosso-Paraná portion of Brazil, but differs in its larger, oblong achene of different color, prominent sulcations and ridges, and in the single fruit of the spikelets instead of 4-5. From *R. tenuis* it is distinguished by the oblong, instead of subglobose or turbinate, achene with more prominent sulcations, narrower and less prominent tubercle, shorter spikelets, and shorter culms, leaves, and bracts, while from *R. tenella* it is separated by the shape of the achene, absence of the long scabrous awn of the scales, and denser clusters of spikelets.

Rhynchospora sororopana Steyermark, sp. nov.

Perennis caespitosa; culmis tenuibus foliatis, 15-50 cm. altis,

0.2-0.5 mm. latis, plerumque quam foliis excedentibus; foliis 15-25 cm. longis, 1.5 mm. latis; fasciculis 3-7, confertis racemoso-subcapitatis, 6-8 mm. longis, 3-4 mm. latis, axillaribus terminalibusque; pedunculis tenuibus, 0.5-5 cm. longis; bracteis setaceis, 2-7.5 cm. longis, 0.5-1 mm. latis; spiculis ovato-lanceolatis, 3.5-4 mm. longis, 1-carpis; squamis ovatis vel ovato-lanceolatis, aristatis vel acuminatis, pallidis; setis nullis; achaenio elliptico-ovoideo, basi angustato, superne nonnihil angustato, 2 mm. longo, 1.2 mm. lato, subtilissime puncticulato; tuberculo conico, 1 mm. longo; stylo breviter diviso, ramis brevibus.

Culms glabrous; leaves glabrous, several; fascicles of the inflorescence scattered along the middle and upper portion of the culms; spikelets with 4 scales; scales pale buff or grayish-green to greenish-stramineous; achene greenish or pale stramineous, minutely puncticulate with cells slightly higher than broad; beak about half the width of the achene.

Type in herb. Chi. Nat. Hist. Mus., collected along Quebrada Sororopán, between Santa Teresita de Kavanayén and Río Tek-Yunsén, state of Bolívar, alt. 1375 m., December 3, 1944, *Julian A. Steyermark 60831.*

A member of Series *Diplostyleae*, Div. *Psilocarya*, Sect. *Paucinucigerae* (following Clarke's divisions), this is related to *R. biflora*, *R. brevirostris*, *R. longispicata*, and *R. nardiflora*. It is distinguished by its pale greenish, gray-green, or greenish-white spikelets, small inflorescences, width of leaves, and details of achene and beak.

Rhynochospora tamana Steyermark, sp. nov.

Perennis caespitosa; culmis glabris, 7-55 cm. altis, 1.5-2 mm. latis; foliis plerumque basilaribus, linearibus, rigidis, supra paullo scabridulis, marginibus scabris, 7-30 cm. longis, 3-3.5 mm. latis; paniculis plus minusve 4, anguste ellipsoidalibus contractis, 3-3.5 cm. longis, 0.7-1.2 cm. latis, axillaribus terminalibusque; rhachibus angulatis, angulis scabris; pedunculis tenuibus, glabris, angulatis, 4-13 cm. longis; bracteis 8-13 cm. longis, 2-3 mm. latis; vaginis bractearum nitidis, fulvo-brunneis; spiculis confertis, fusiformibus, 9-10 mm. longis, 1.5-2 mm. latis, subsessilibus vel breviter pedicellatis, 2-carpis; squamis ovatis vel lanceolatis, breve aristatis, 4-9.5 mm. longis, castaneis; setis 6, antrorse hispidulis, tuberculum excedentibus, 8-8.5 mm. longis; achaenio fusiformi-elliptico, basi manifeste stipitato, 3.5 mm. longo, 1 mm. lato, subtilissime puncticulato; tuberculo conico-subulato, quam achaenio paullo breviore, 1.5-2 mm. longo, basi parce hispidulo; stylo bifido, ramis 3 mm. longis, stylo brevioribus.

Culms leafy below, exceeding the leaves; lower leaf surface covered with gray-white stomata between the raised nerves; bracts somewhat foliaceous; spikelets with 5 scales; achene stramineous

minutely puncticulate with numerous narrow reticulations much higher than broad (Fig. 6, d).

Type in herb. Chi. Nat. Hist. Mus., collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary, state of Táchira, alt. 3045-3475 m., July 15, 1944, *Julian A. Steyermark 57404*. Also collected in same locality, *Steyermark 57398*.

Related to *R. macrochaeta* Steud., from which it differs in the more elongated achene which is stipitate-based, shorter narrower panicles, longer scales and spikelets, narrower, more rigid, and more scabrid leaves, and the generally smaller stature.

Rhynchospora tepuiana Steyermark, sp. nov.

Perennis caespitosa; culmis setaceis foliatis, 10-25 cm. altis, 0.5 mm. latis; foliis setaceis, glabris, 8-13 cm. longis, 0.2-0.3 mm. latis; vaginis membranaceis, glabris, quam laminis latioribus, ore subtruncato; inflorescentia corymbosa vel subcorymbosa, 6-10 mm. alta, 5-8 mm. lata; bracteis 2.5 cm. longis, quam inflorescentia longioribus; spiculis 2-10, anguste ellipticis, 3-4 mm. longis, 5-floris, 5-carpis vel paucioribus; squamis late ovatis, mucronatis, 1.6-2.7 mm. longis, castaneis; setis 1-6 vel nullis, rudimentariis, antrorse serrulatis, 0.5-0.9 mm. longis; achaenio elliptico-obovoideo, substipitato, lenticulari, 1.5 mm. longo, 0.6-0.7 mm. lato, breviter transversim ruguloso, inter rugas leviter reticulato-puncticulato; tuberculo deltoideo; stylo profunde diviso, ramis longis.

Orifice of sheath with 2 lateral processes; bracts setaceous; spikelets about 1 mm. wide, with 9 scales; scales mucronate or short-awned, the lowest 2 empty scales 1.6-1.8 mm. long, the others 2.5-2.7 mm. long; bristles ferruginous-brown; achene abruptly narrowed and substipitate at base, gradually narrowed above, pale buff or stramineous, pilosulous at summit just below tubercle, shallowly cross-wrinkled with rows in between the wrinkles of faint puncticulations higher than broad, the cells in the lower fourth longer, broader, and nearly as broad as high; tubercle inconspicuous, deltoid or conic, about half the width of achene, pale brown; branches of style much longer than the style proper (Fig. 5, g).

Type in herb. Chi. Nat. Hist. Mus., collected on forested southwest-facing quebrada near Rondón Camp, Mount Roraima, state of Bolívar, alt. 2040 m., September 25, 1944, *Julian A. Steyermark 58652*. Also collected on rocky hematite exposures on open slopes on summit at west end of Sororopán-tepuí, alt. 2225-2255 m., November 13, 1944, *Steyermark 60061*.

This species is related to *R. Sellowiana* Steud., 1855, not *R. Sellowiana* Boeckl., 1873, to *R. Gollmeri* Boeckl., and to *R. roraimae* Kük. From *R. Sellowiana* Steud, it differs in its castaneous, not stramineous spikelets with much shorter setae. From *R. Gollmeri* of the Caracas and Cordillera de la Costa area, it differs in the shorter spikelets, long-cleft style, shorter tubercle of achene, much shorter

bristles, and more conspicuously rugulose or reticulate instead of almost smooth achene. From *R. roraimae* it differs in the greater number of spikelets, longer, less rigid culms and leaves, shorter tubercle, presence of setae, and more rugulose-reticulate achene.

Rhynchospora tomentosa Steyermark, sp. nov.

Perennis; culmis foliatis, 7.5 dm. altis; foliis basilaribus et culmis subcoriaceis, rigidis, undique velutino-tomentosis, 25-30 cm. longis, 9-10.5 mm. latis; paniculis 5-6, oblongo-lanceolatis, densifloris, 4-4.5 cm. longis, 1.3-1.5 cm. latis, axillaribus terminalibusque; rhachibus hispidulis; pedunculis 1.5-6 cm. longis, tomentosis; bracteis foliaceis, paniculas excedentibus, 6.5-12 cm. longis, 3-6.5 mm. latis, adpresso-villosulis infra praesertim; vaginis bractearum foliorumque velutino-tomentosis vel tomentosis; spiculis confertis anguste lanceolatis vel fusiformi-ellipticis, 5-5.5 mm. longis, 1.5 mm. latis, breviter pedicellatis, 1-carpis; squamis ovatis vel ovato-oblongis manifeste aristatis, 2-4.5 mm. longis, fusco-castaneis, arista 1-10 mm. longa, hispidula; setis 2-3, antrorse hispidulis, achaenio longioribus; achaenio oblongo-obovoideo, biconvexo, 1.8 mm. longo, 1 mm. lato, subtilissime transversim lineolato; tuberculo conico, 1 mm. longo; stylo parce diviso.

Lower side of leaves especially velutinous-tomentose, deeply sulcate or canaliculate above, midrib prominent below; panicles erect; lower spikelet scales 2-2.5 mm. long, with an awn 1-1.25 mm. long, the upper 3.5-4.5 mm. long with awns 9-10 mm. long; achene stramineous, finely transversely lineolate with many vertical rows, the lineolations broader than high; tubercle 3/4 width of achene (Fig. 6, e-h).

Type in herb. Chi. Nat. Hist. Mus., collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary, state of Táchira, alt. 3045-3475 m., July 15, 1944, *Julian A. Steyermark 57391.*

This unusual species is well-marked by its velutinous-tomentose leaves, bracts, and sheaths, and conspicuously aristate scales. It is related to *R. macrochaeta* Steud.

Rhynchospora Trichochaeta C. B. Clarke, var. **venezuelensis** Steyermark, var. nov.

A typo differt bracteis quam capitulo longioribus, 6-15 mm. longis, marginibus breviter ciliato-pilosis; tuberculo longiore angustioreque acutiore, pilis scabris longioribus.

Achene dark brown or blackish-brown (Fig. 5, h).

Type in herb. Chi. Nat. Hist. Mus., collected on rocky savanna slopes between Ciudad Bolívar and Río Caroní, state of Bolívar, alt. 100 m., August 1, 1944, *Julian A. Steyermark 57587.*

In *R. Trichochaeta* of Brazil (*Gardner 2385*, type), (Fig. 5, i), the bracts are only 4 mm. long, densely and long-ciliate on the margins, and the tubercle is short, broad, and obtuse at apex. Clarke describes the achene as "fusce straminea", but examination of type material found in the herbaria of the New York Botanical Garden and in the United States National Herbarium shows the achenes to vary from fuscous-stramineous to dark brown.

Cladium costatum Steyermark, sp. nov.

Radix repens; culmo triquetro, 25 cm. longo, 3-3.5 mm. lato, glabro; foliis subxiphoideis, basilaribus numerosis, planis, 35-50 cm. longis, 7-8.5 mm. latis, multo-nervatis, costa prominenti, glabris; caulinis brevioribus erectis, supremis spathaeformibus; spicularum fasciculis paniculatis numerosis, atro-vinaceis vel castaneo-rubris; spiculis 3.5-5 mm. longis, ovoideis, 2-3-nuciferis; squamis ovatis, apice obtusis vel rotundatis, 2.5-3 mm. longis, 1.5-2 mm. latis, glabris; staminibus 2; stylo longo, ramis 2, linearibus; setis hypogynis, nullis; achaenio fulvo, biconvexo, ovato-elliptico, 3.2-3.8 mm. longo, 1.5-2 mm. lato, marginibus conspicue costatis angulatis, glabro, sensim in rostrum contracto.

Plant growing in colonies, with creeping rootstock; inflorescence elongate-paniculate, 20-23 cm. long, the 12-15 spikes fascicled; rachis of inflorescence more or less compressed, ancipital, mostly scabridulous on angles; peduncular branches of spikes ancipital, 2-angled, more densely scabridulous on margins; spikelets 3-4-flowered; bracts subtending spikelets 3, ovate, aristate, 2.5-3.5 mm. long; scales 3, the fruiting ones especially with prominent midrib; anthers 1.5 mm. long, linear-lanceolate, appendiculate, filaments elongating to 4 mm.; achene dull brown, subturgid, conspicuously ribbed and wing-angled on two lateral margins, gradually tapering into a slender beak blackish-brown at tip.

Type in herb. Chi. Nat. Hist. Mus., collected along Quebrada Sororopán between Santa Teresita de Kavanayén and Río Tek-Yunsén, state of Bolívar, alt. 1375 m., December 3, 1944, *Julian A. Steyermark 60829*. Collected also at Salto de Iwaracaru-merú, at western end of Sororopán-tepuí, alt. 1615 m., November 15, 1944, *Julian A. Steyermark 60220*.

This species is characterized by the creeping rootstocks, elongate inflorescence with fasciculate panicles, numerous subdistichous leaves with prominent midrib, 2 stamens, bifid style, and especially the biconvex achenes with prominently ribbed and angled margins. According to Dr. Svenson, who greatly assisted in a critical study of this plant, "it has a general appearance to *C. restioides* (Sw.) Benth. of the west Indies, but the possession of achenes without bristles resembles more such species as *C. jamaicense* than those of the *Machaerina* and *Vincentia* groups."

Tribe HYPOLYTREAE

Hypolytrum tepuianum Steyermark, sp. nov.

Viridis; culmis rigidis, erectis, subacute trigonis, glabris, 1.3-1.6 m. altis, 4.5-5.5 mm. latis; foliis rigidis, subcoriaceis, viridibus, anguste lineari-lanceolatis, undique pluristriatis, marginibus parte superiore et costa inferiore valide scabrido-serrulatis, marginibus parte inferiore glabris, 90-100 cm. longis, 18-21 mm. latis; inflorescentia subumbellate decomposita vel subcorymbifere-umbellata 10-16-ramosa; ramis simplicibus monostachyis, striatis, angulatis, minute hispidulis, 1-3.5 cm. longis, 2-2.5 mm. latis, foliaceo-bracteatis; bracteis 4-5, inaequalibus, rigidis, subcoriaceis, deflexis, lineari-lanceolatis, undique pluristriatis, marginibus manifeste serrulatis, costa infra manifeste serrulata prominenti, 6-24 cm. longis, 4-15 mm. latis; spicis densifloris, confertis, subgloboso-capitatis, 1-1.5 cm. longis, 1.2-1.4 cm. latis; spiculis ovoideis, 6 mm. longis, 3.5 mm. latis; squamis suborbicularibus apice rotundatis ferrugineis, 3.5-4 mm. longis, 3.5-4 mm. latis; squamulis oblongis vel elliptico-oblongis, obtusis, liberis, glabris; staminibus 2; achaenio paullo compresso, subtereti-lenticulari, infra medium paullo constricto elliptico-oblongo, nitido, glabro, fulvo-castaneo, superne vinaceo-maculato, 5-6 mm. longo, 1.2-1.3 mm. lato; rostro tenui, achaenio aequale, 1.5-3 mm. longo, glabro.

Culms nodulose; leaves deep green above, dull green below; inflorescence with 10-16 stout, simple branches; spikelets subobtuse, rufescent; scales subtending spikelets suborbicular, rounded at apex, membranaceous, rufous-brown with numerous orange-brown splotches, the margins hyaline; floral glumes 4, free to base, 2 of them subtending stamens, glabrous, oblong to elliptic-oblong, obtuse and entire or with hyaline-suberose apex, 4.5 mm. long, 1.2-2 mm. wide, rufous-streaked below; achene fulvous to dark chestnut brown, the lower half usually darker brown than the upper half, the upper half dull purplish-red spotted; stigmatic branches 2 (Fig. 6, i-l).

Type in herb. Chi. Nat. Hist. Mus., collected in savanna, vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepuí, state of Bolívar, alt. 1615 m., November 15-17, 1944, *Julian A. Steyermark 60238.*

Very well marked by the tall culms, broad, stiff, elongated leaves and bracts subtending the subumbellate inflorescence with simple thick branches, large smooth achenes with long beak, and glabrous floral scales.

U. OF ILL. LIB.

Tribe SCLERIAE

Scleria tepuiensis Core, sp. nov.[7]

Rhizomate ligneo, squamis atro-rubris intecto; culmo 1-2 m. alto, triquetro; foliis 30 cm. longis, 5-12 mm. latis, glabris, rigidis, costa subtus et marginibus scabris; vaginis glabris, triquetris; ligula abbreviata, rotundata; paniculis 5-15 cm. longis, purpurascentibus, densis; bracteis foliaceis; spiculis masculis longe pedicellatis, numerosis; spiculis foemineis paucis, in ramorum basi subsessilibus; squamis masculis anguste mucronatis; squamis foemineis lanceolatis; hypogynio sine lobis; achaenio albo, 2-3 mm. longo, hirtello, obtuse trigono. *Scleriae cyperinae* proxime affinis.

Rhizome thick, hard, nodose; culms slender, shining, the angles smooth or somewhat roughened; leaves chartaceous, scabrous on the margins and main veins beneath; sheaths smooth or somewhat roughened on the angles, wingless or very narrowly winged; ligule rotund-triangular, with a thin, scarious margin (not appendaged); panicles terminal, single, or with additional smaller ones in the upper axils, ovate to ovate-rotund, dense, much-branched, brown-purple, rachis scabrous, the branches short, divergent; bracts about 3, exceeding the inflorescence; bractlets linear-setaceous; staminate spikelets numerous, linear, 5-6 mm. long, on slender peduncles 5-6 mm. long; pistillate spikelets solitary at the bases of the branches; staminate scales narrow, purplish; pistillate scales glabrous, purplish; hypogynium rigid, wrinkled, white, the lobes none or very obscure; achene white or sometimes purplish-tinged.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. West Virginia University, collected on summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58232.* Also collected in same locality, *Tate 738* (NY). BRITISH GUIANA: Paulo, near Mt. Roraima, alt. 4000 ft., *Tate 152* (NY).

This species is closely related to *S. cyperina*, to which the Tate specimens had been doubtfully referred. It differs in lacking the pronounced lobes of the hypogynium characteristic of that species, and also in the nature of the ligule, which is chartaceous throughout in *S. cyperina*, but membranaceous-margined in *S. tepuiensis*. The leaves in the latter species also average somewhat narrower, at least in the specimens observed. Only two other known members of the section *Hymenolytrum*, in addition to *S. tepuiensis*, lack the large, conspicuous, scarious appendage to the ligule found in most members of that section. The third species, *S. grandis*, is a very robust plant with leaves 18-35 mm. wide.

The specific epithet refers to its occurrence on sandstone mesas of Venezuela and British Guiana, which are known locally as *tepuis*.

[7] By Earl L. Core

Tribe CRYPTANGIEAE *(LAGENOCARPEAE)* [8]

Exochogyne amazonica C.B.Clarke, var. **esmeraldensis** Gilly, var.nov.

Perennis, rhizome brevissime repens; folia basalia 4-6, vaginae ad 6 cm. longae dense et minute pilosulae, lamina lineari ad 20 cm. longa et 1.5 mm. lata, glabra marginibus inferioribus sparse hirsutulo-ciliolatis excepte; culmi floriferi glabri erecti graciles, cum inflorescentia ad 12 cm. alti; inflorescentia ad 3 cm. longa, bractea subfoliacea acuminata, inferioribus ad 4 cm. longis, medioribus ad 1.2 cm. longis, glabra, marginibus inferioribus dense albo-ciliatis excepte; spicae bisexualae, cum spiculae masculae 2-4 et foemineae 2 vel 3; spiculae masculae 7-9 mm. longae et 0.5-0.7 mm. latae, glumis vacuis 2 ovatis vel lanceolato-ovatis glabris, ad 2 mm. longis, glumis fertilibus 2 vel 3 lineari-lanceolatis glabris vel sparse pubescentibus ad apicem; stamina a gluma fertile subtenta 2, filamentis persistentibus; spiculae foemineae ad 2 mm. longae, glumis 3-5 ovatis glabris, 1-2 mm. longis; achaenium breviter stipitatum glabrum laeve bisulcatum oblongo-quadrangulatum sublenticulare, cum rostro laevi et inflato-clavato ad 2 mm. longum; rostro quam corpore achaenii dimidio breviore; squamellae hypogynae nullae; stylus bifidus, stigmatibus brunneis ad 3 mm. longis.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on dry savanna between Esmeralda Savanna and southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 22, 1944, *Julian A. Steyermark 57805.*

The typical phase of the species is a more robust plant with longer leaves, larger inflorescences, and with 6 or more staminate spikelets in each spike, originally collected from a tributary of the Rio Madeira in the southwestern part of the Amazon basin. The several previously described "species" of this genus—which is thus far known only from 6 or 7 collections from isolated Amazonian savannas—appear to represent minor variants of a single species.

Exochogyne Steyermarkii Gilly, sp. nov.

Perennis, subrhizomatis vel caespitosis; folia basalia 4-6, vaginae ad 10 cm. longae sparse et minute adpresso-pilosulae, laminis linearibus ad 40 cm. longis et 1 mm. latis, glabris vel subtus sparse strigillosis; inflorescentia ad 10 cm. longa, bractea inferiore foliacea ad 18 cm. longa et 1 mm. lata, bracteis medioribus ad 1.5 cm. longis et 1 mm. latis, glabrae vagina minute strigillosa excepta; spicae bisexualae, cum spiculae masculae 2 vel 3 et spiculae foemineae 2 vel 3; spiculae masculae 4-5.5 mm. longae et 0.3-0.5 mm. latae, glumis vacuis 1 vel 2 lanceolatis vel ellipticis glabris, ad 2 mm. longis, glumis fertilibus 2 vel 3 linearibus vel lineari-lanceolatis glabris, ad 5.5 mm. longis; stamina a gluma fertile subtenta 2,

[8] By Charles L. Gilly

filamentis persistentibus; spiculae foemineae ex vagina protrudens ad 2 mm. longae, glumis 2-4 ovatis glabris, 1-2 mm. longis; achaenium glabrum laeve marginatum sublenticulare oblongo-quadrangulatum vel cum rostro laevi et inflato ellipsoideum, ad 2.5 mm. longum; squamellae hypogynae nullae; stylus bifidus, stigmatibus brunneis ad 2 mm. longis (Fig. 6, m).

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected in swampy woods, between Esmeralda Savanna and southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 22, 1944, *Julian A. Steyermark 57820.*

This species differs from all the other known species of the genus in the narrowness and small size of the inflorescence bracts. With regard to the small number of pistillate spikelets, this species is most nearly like *E. megalorrhyncha* Tutin, but in glabrity and cespitose habit it is more nearly like *E. amazonica* C. B. Clarke.

Cephalocarpus Steyermarkii Gilly, sp. nov.

Caulis gracilis ramosus, ad 10 cm. altus; folia linearia acuta bicarinata sparse pilosa, 8-20 cm. longa et 1.5-2 mm. lata; culmi floriferi solitarii in axillibus foliorum, 4-8 cm. alti; inflorescentia capitata multispiculata; bracteae inferiores inflorescentiam subtendentes ad 2 cm. longae, dense vel sparse pilosae; spiculae masculae 4-5 mm. longae, ad 1 mm. diam.; glumis vacuis 3-5, lanceolatis mucronatis glabris vel mucrone sparse pilosis, glumis staminibus 2-3, lanceolatis acutis hyalinis glabris; antherae 2.75-3 mm. longae; spiculae foemineae 4-5 mm. longae, glumis 5-8, lanceolatis acuminato-mucronatis glabris vel mucrone sparse pilosis; achaenium subteretium obovoideum glabrum stramineum, 1.75-2 mm. longum, ad 1 mm. diam., rostro 1-1.5 mm. longo persistenti sparse pubescente; squamellae hypogynae ovato-orbiculares, ciliis subcopiosis quam corpore achaenii 4- vel 3-plo brevioribus.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected in shaded spots in scrubby forest on rocky open portion of plateau on southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59640*; south-facing slopes, Ptari-tepuí, alt. 1800-1900 m., *Steyermark 59800.*

A member of the subgenus *Neocephalocarpus*, most closely related to *C. longibracteatus* Gilly, but approaching *C. lineariifolius* Gilly in length and narrowness of leaves. The several specimens examined vary considerably in the length to which the branched stem has developed.

Everardia montata Ridley, var. **pilosa** Gilly, var. nov.

A plantae typicae differt marginibus foliorum albo-pilosis copiosis; culmis floriferis dense albo-pilosis; bracteis paniculis secundariis subtendentibus cum vaginae dense et minute pubescentibus; achaenio

cum corpore 3 mm. longo et 1 mm. lato et cum rostro minute pubescenti 2.5 mm. longo.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on summit of Cerro Duida, on high moist ridge top, Territorio Federal Amazonas, alt. 1820-2075 m., September 4, 1944, *Julian A. Steyermark 58318.*

The typical phase of the species is known from the eastern end of the series of cerros.

Everardia ptariensis Gilly, sp. nov.

Caulis brevis; folia ad 10.5 cm. longa, ad basim 8-10 mm. lata, glabra, margine et costa scabridulo-ciliolata excepta, margine revoluta; culmi floriferi laxe adscendentes, cum inflorescentia ad 6 dm. alti; vagina vacua ad basim 1.5 mm. longa, vaginae floriferae atro-brunneae vel rubro-brunneae glabrae lamina subaequantae; spiculae masculae 4-5.2 mm. longae, glumis vacuis 3-5, ovatis mucronulatis ciliolatis ad apicem, glumis staminibus 2-4, oblongis vel oblongo-lanceolatis glabris acutis vel truncatis et erosis ad apicem; spiculae foemineae 3-4 mm. longae, glumis 4-6 ovatis ciliolatis mucronulatis vel mucronatis; achaenium glabrum stramineum vel pallido-brunneum ellipsoideum, 0.8-1 mm. diam. cum rostro 3.5 mm. longum; rostro conico glabro, quam corpore achaenii 3-plo brevioribus; squamellae hypogynae minute suborbiculares, ciliis copiosis quam corpore achaenii 3-vel 4-plo brevioribus; stigmata gracilia atrobrunnea.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on forested south-facing slopes overlying sandstone on "Cave Rock" above "Cave Camp", Ptari-tepuí, state of Bolívar, alt. 1810 m., October 29, 1944, *Julian A. Steyermark 59496.*

Allied to *E. montana* Ridley in vegetative habit, but differing markedly in the very slender, much elongated flowering culms and in the structure of the achene.

Everardia Steyermarkii Gilly, sp. nov.

Caulis robustus ramosus, ad 2.8 dm. altus, vaginis persistentibus fibrilosis tecta; folia ad 4.3 dm. longa et 3-3.5 mm. lata, plana vel bicarinata ad apicem linearia dense albo-pilosa vel albo-lanata et tarde glabrata; culmi floriferi erecti lanati, cum inflorescentia ad 3.5 dm. alti, vagina vacua ad basim 2.5-3 cm. longa, vaginae floriferae atrobrunneae albo-pilosae lamina subaequantae; spiculae masculae 5-6.5 mm. longae, glumis vacuis 4-7, ovatis vel lanceolato-ovatis mucronatis glabris, glumis staminibus 2-4, lanceolatis vel oblongo-lanceolatis acutis glabris; antherae ad 3.5 mm. longae; spiculae foemineae, omnes ad apicem inflorescentiae dispositae, jam deficientes; achaenium ignotum.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, in *Brocchinia-Stegolepis-Heliamphora* swamp on southwest-

facing shoulder, Ptari-tepuí, state of Bolívar, alt. 2200 m., November 2, 1944, *Julian A. Steyermark 59781.*

So far as vegetative habit is concerned, this is the most distinctive species in the genus. It is most closely allied with *E. angusta* N. E. Brown and *E. gracilis* Gilly, two species known only from Mount Roraima.

Lagenocarpus bifidus Gilly, sp. nov.

Caulis ignotus; folia lanceolato-linearia plana glabra glauca rigido-coriacea ad 9 dm. longa, ad basim 2 cm. lata et ad medium 1-1.3 cm. lata, marginibus antrorse hispido-serratis; culmi floriferi triangulares glabri, cum inflorescentia ad 1.2 m. alti; inflorescentia interrupta e paniculis secundariis pluribus composita; spiculae masculae ad 2.8 mm. longae in paniculis inferioribus laxe aggregatis, glumis vacuis 4-6, lanceolatis acutis vel mucronatis glabris, glumis staminibus 4-8, lanceolatis vel oblongo-lanceolatis subacutis vel erosis ad apicem; spiculae foemineae uniflorae ad 4.5 mm. longae paucae in paniculis superioribus rigidioribus congestae, glumis 6-8, ovatis vel orbiculato-ovatis bifidis et aristatis ad apicem, aristae ad 1.5 mm. longae hispidae; achaenium rubro-brunneum ovoideum glabrum lucidum et subrugosum tricostatum, cum rostro conico 3.5 mm. longum; rostro quam corpore achaenii subaequantes; squamellae hypogynae deltoideae minute ciliolatae ad 0.2 mm. longae; stylo trifido.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on Gran Sabana, between Divina Pastora on Río Kukenán and Santa Elena, south of Mount Roraima, state of Bolívar, alt. 915-1005 m., October 3, 1944, *Julian A. Steyermark 59302.*

Resembles *L. diffusus* Gilly in the bifid and aristate pistillate glumes, but near *L. tremulus* Nees in characters of the achenes.

Lagenocarpus diffusus Gilly, sp. nov.

Caulis brevis lignosus ad 2 cm. diam., vaginis persistentibus laceratis tecta; folia grisea lanceolato-linearia plana glabra rigido-coriacea acuta, ad 9.5 dm. longa, ad basim 1.8 cm. lata et ad medium 1 cm. lata, marginibus antrorse hispido-serratis; culmi floriferi robusti glabri, cum inflorescentia ad 1.4 dm. alti; inflorescentia interrupta e paniculis secundariis pluribus composita; spiculae masculae ad 3.5 mm. longae numerosae in paniculis inferioribus laxe diffusis aggregatis, glumis vacuis 3-5, lanceolatis vel oblongo-lanceolatis minute bifidis ad apicem mucronatis vel mucronulatis ciliolatis, glumis staminibus 4-8, lanceolatis acutis erosis et ciliolatis; antherae 1.7 mm. longae; spiculae foemineae uniflorae ad 3.5 mm. longae, paucae in paniculis superioribus rigidioribus confertis, glumis 4-6 ciliolatis ovatis vel orbiculato-ovatis, ad apicem bifidis et aristatis, aristis ad 1.5 mm. longis; achaenium glabrum laeve conico-ellipsoideum trisulcatum ad basim, cum rostro laevi truncato

ad 2.5 mm. longum et ad 1.5 mm. diam.; squamellae hypogynae triangulares, ad 0.5 mm. longae, marginibus laevibus nec ciliolatis; stylo trifido.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58218.*

Allied to *L. Sprucei* H. Pfeiffer and *L. guianensis* Nees, but differing from them in the bifid and aristate glumes and in the characters of the achene.

Lagenocarpus glomerulatus Gilly, sp. nov.

Subcaespitosa, caulibus brevibus, vaginis persistentibus reticulato-fibratis tecta; folia 6.5 dm. longa et ad 7 mm. lata linearia plana vel bicarinata ad apicem glabra vel hispidulosa; culmi floriferi triangulari glabri, cum inflorescentia ad 6 dm. alti; inflorescentia interrupta, bracteae paniculis secundarius subtendentes cum vaginae breves et laminae vaginorum 10- a 30-plo longioribus; spiculae masculae 2.5 mm. longae glomerulatae, 7-15 aggregatae conjunctim in paniculis inferioribus laxe confertae, glumis vacuis 2-4, ovatis vel lanceolato-ovatis mucronatis glabris, margine ciliolatis exceptis, glumis staminibus 6-15, lanceolatis vel lineato-lanceolatis acutis vel erosis et ciliolatis ad apicem; antherae ad 1.2 mm. longae; spiculae foemineae uniflorae ad 3.5 mm. longae, solitariae vel geminae in paniculis superioribus paucifloris rigidis instructis, glumis 5-8, ovatis oblongo-ovatis vel late ellipticis ciliolatis truncatis vel minute bifidis et mucronatis ad apicem; achaenium late ellipsoideum subteretium rubro-brunneum vadose trisulcatum subrugulosum et alveolarum, 2 mm. diam. et cum rostro laevi stramineo 3.5 mm. longum; rostro minute pubescente ad apicem, quam corpore achaenii 3-plo brevioribus; squamellae hypogynae late orbiculares vel quadrangulares ad 0.5 mm. longae ciliolatae et albo-pilosae; cilii quam squamellae subaequantes; stylo trifido, stigmata rosea vel rubro-brunnea.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on rocks along Río Karuai between Santa Teresita de Kavanayén and base of Ptari-tepuí, state of Bolívar, alt. 1220 m., November 18, 1944, *Julian A. Steyermark 60340.*

A very distinctive species apparently related, at least in the characters of the achene and the staminate spikelets, to *L. rigidus* Nees of eastern Brazil, but differing markedly from that species in foliage and type of inflorescence.

Lagenocarpus sabanensis Gilly, sp. nov.

Subcaespitosa, caulibus brevibus lignosis, vaginis persistentibus laceratis tecta; folia linearia plana ad 4 dm. longa et 5 mm. lata, dense minute pubescentia supra et infra, marginibus minute hispidulo-scabratis; culmi floriferi canaliculati dense adpresso-villosuli, cum

inflorescentia ad 1.2 m. alti; inflorescentia interrupta, bracteis paniculis secundariis subtendentibus cum vaginae minute hispido-pubescentiae et laminae adpresso-villosulae; spiculae masculae ad 4.5 mm. longae in paniculis inferioribus laxe aggregatis, glumis vacuis 5-8 minute pubescentibus oblongo-ovatis vel ovatis ad apicem truncatis vel subtruncatis aristatis, glumis staminibus 4-6 glabris lanceolatis vel lineari-lanceolatis acutis; spiculae foemineae uniflorae ad 4 mm. longae, paucae in paniculis superioribus rigidioribus dispositis, glumis 6-9 minute pubescentibus ovatis vel quadrangulato-ovatis ad apicem truncatis vel sub-bifidis et aristatis; achaenium flavo-brunneum ovoideum glabrum laeve trisulcatum, cum rostro conico laevi ad 4 mm. longum; rostro quam corpore achaenii subaequantes; squamellae hypogynae lanceolatae vel lanceolato-deltoideae ad marginem minute erosae, 0.8-0.9 mm. longae; stylo trifido atrobrunneo vel rubro-brunneo.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected on Sabana Grande, at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 23, 1944, *Julian A. Steyermark 57855.* Apparently most closely related to *L. guianensis* Lindl. & Nees, but differing in the more slender habit, narrower leaves, general distribution of pubescence, and details of the spikelets and achenes.

Lagenocarpus Steyermarkii Gilly, sp. nov.

Caulis brevis lignosus ad 1 cm. diam., vaginis persistentibus reticulato-fibratis tecta; folia argenteo-grisea scabro-hispidae supra linearia rigida ad 5.5 dm. longa et 1 cm. lata, marginibus antrorse hispido-serratis; culmi floriferi obtuse triangulares, cum inflorescentia interrupta ad 9 dm. alti; spiculae masculae 3.5 mm. longae numerosae in paniculis inferioribus dense congestis, glumis vacuis 2-4, ovatis vel oblongo-ovatis hispidulo-puberulentibus acutis et mucronatis vel mucronulatis, glumis staminibus 3-6, lanceolatis vel oblongo-lanceolatis puberulentibus acutis vel erosis ad apicem; antherae 1.5 mm. longae, filamentis persistentibus; spiculae foemineae uniflorae ad 3.5 mm. longae, paucae in paniculis parvis superioribus rigidioribus congestis, glumis 5-8, hispidulo-puberulentibus ovatis subacutis et subemarginatis et mucronulatis; achaenium ellipsoideum stramineum glabrum subrugulosum et trisulcatum ad basim, 1.8 mm. diam. cum rostro lacunoso laevi 3.5 mm. longum; rostro quam corpore achaenii subaequantes; squamellae hypogynae triangulares ad 0.3 mm. longae, ciliis paucis et minutissimis; stylo trifido.

Type in herb. Chi. Nat. Hist. Mus., isotype in herb. Iowa State College, collected in sandy wet ground with *Stegolepis* and *Brochinia* on large mesa, between Mission of Santa Teresita de Kavanayén and Río Karuai, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59363.*

Allied to *L. guianensis* Nees in characters of the glumes and inflorescence bracts, and to *L. tremulus* Nees in characters of the achenes; amply differing from both of these species in the short and narrow leaves and the congested secondary panicles of the inflorescence.

Pseudoeverardia Gilly, gen. nov.

Herba perennis terrestris vel epiphytica dioica; folia tristichoimbricata persistentia; culmi solitarii in axillibus foliorum; inflorescentia mascula multispiculata, spiculis confertis; spiculae masculae aggregatae, glumis exterioribus vacuis 4-6, glumis interioribus staminibus 3-8; stamina a gluma fertile subtenta 1-3, filamentis persistentibus, antheris apiculato-mucronatis; inflorescentia foeminea elongata verticillata; spiculae foemineae solitariae vel geminae, glumis 6-8; achaenium subteretium tricostatum, rostro brevi; perianthio trifido, lobis membranaceis ad marginem laceratis; stylo trifido.

Type species: *Pseudoeverardia flexifolia* (Gilly) Gilly.

Most closely related to the genera *Everardia* Ridley and *Cephalocarpus* Nees, but differing from both in being dioecious and in the type of achene, achene beak, and perianth scales; also differing from *Everardia* (but not from *Cephalocarpus*) in having only 1-3 stamens in each staminate flower.

Pseudoeverardia flexifolia (Gilly) Gilly, comb. nov. et descr. ampl.

Didymiandrum flexifolium Gilly, Bull. Torr. Bot. Club 68: 331. 1941.

Planta mascula: caulibus ad 3 mm. latis et 3 dm. altis, vaginis persistentibus tarde fibrillosis tecta; folia 1.5-6.5 dm. longa, 1.5-2.2 mm. lata, linearia acute plana ad basim et bicarinata supra medium, dense villoso-pubescentia vel tarde glabrata; culmi floriferi rigidi erecti minute pubescentes, cum inflorescentia ad 3 dm. alti; spiculae masculae 5 mm. longae, glabrae aggregatae, glumis vacuis 4-6, ovatis acutis vel sub-bifidis mucronatis, mucrone ad 1 mm. longo, glumis staminibus 6-8, lanceolatis; antherae 2-2.5 mm. longae. Planta foeminea: caulibus et foliis planta mascula simulans; culmi floriferi rigidi erecti, cum inflorescentia ad 1.5 dm. alti; spiculae foemineae solitarii vel geminae ad apicem pedicellorum, verticillatae, 3.5-5 mm. longae et ad 1 mm. diam., glumis 6-8, glabris exterioribus ovatis vel triangulo-ovatis mucronatis, interioribus lanceolatis vel lanceolato-ovatis acutis vel mucronulatis; achaenium brunneum tricostatum obovoideum minute pubescentium supra medium, ad 1 mm. diam., cum rostro 2.8 mm. longum; rostro obtuso-conico stramineo dense et minute pubescenti, 0.5 mm. longo; squamellae hypogynae 3, membranaceae hyalinae ad apicem lacerato-erosae, ad 0.7 mm. longae; stylo trifido, stigmatibus gracilibus brunneis vel rubrobrunneis.

Type in herb. New York Botanical Garden, isotype in U.S. National Herbarium, collected on summit of Cerro Duida, epiphyte on bark of tree, flat near stream at Central Camp, alt. 4800 ft., December 20-28, 1928, *Tate 542*, staminate plants; common as ground cover on dry slopes throughout Brocchinia Hills, alt. 1700-1980 m., September 1, 1944, *Steyermark 58194b.* (F), staminate plants; growing with the preceding, *Steyermark 58194a.* (F), pistillate plants.

At the time when I described the genus *Didymiandrum*, based on *D. stellatum* (Boeckl.) Gilly, I reluctantly placed this species (then known only from staminate plants) in that genus for lack of any other suitable place. It is peculiarly satisfying to be able to dispose of this species in a satisfactory manner at the present time, now that both staminate and pistillate plants are available.

Tribe CARICEAE

Uncinia meridensis Steyermark, sp. nov.

Stolonifera; culmis 1-7 cm. altis, 1-1.5 mm. latis, obscure trigonis glabris; foliis patentibus quam culmis multo brevioribus, rigidis subcoriaceis, 3-5.5 cm. longis, 1.5-3.5 mm. latis, marginibus et costa inferiore superioreque scabrido-serrulatis; spicis lanceolato-ellipticis vel clavato-ellipticis androgynis densifloris, 12-20 mm. longis, 2-2.5 mm. latis, parte mascula brevissima; squamis foemineis ovatis subacutis vel subobtusis, plerumque glabris, marginibus brunneis aliter pallido-viridibus, 5.5-7 mm. longis, 3.5-4 mm. latis; squamis inferioribus aristatis, arista 6.5 mm. longa, scabrido-ciliata; utriculis ellipticis, basi et apice angustatis, infra glabris, superne scabrido-hispidulis stramineis vel pallidis, 5-5.5 mm. longis, 1.5 mm. latis, tenuiter et obscure pauce nervatis; stylo basi paullo incrassato; achaenio quam utriculo multo breviore, 2.5 mm. longo; rhachilla secundaria utriculo subduplo superante uncinata glabra recta.

Leaves grass green, conspicuously scabrid-serrulate on margins and midrib of lower surface, minutely and inconspicuously scabridulous on midnerve of upper surface, complicate at base, otherwise plane; spikes 10-flowered, glabrous except for minutely erose-ciliolate margins about apex, subcoriaceous, closely appressed, imbricate, persistent, 3-nerved, mostly exceeding the perigynia; rachilla 7.5-8 mm. long, the exserted portion 4-4.5 mm. long; stigmas 3, exserted, reddish-brown (Fig. 7, k-m).

Type in herb. Chi. Nat. Hist. Mus., collected on margin of alpine lake at El Aguila above Páramo de Mucuchíes, state of Mérida, alt. 4025 m., July 6, 1944, *Julian A. Steyermark 57039*. Also collected along rocky lake shore, near upper limit of páramo, between Chachopo and Los Apartaderos, state of Merida, alt. 3930 m., *Steyermark 55875*.

Easily distinguished by the dwarf habit, very short culms, leaves, and spikes. Most closely related to *U. brevicaulis* var. *macloviana* f. *montana* (Phil.) Kük. (*U. macloviana* var. *montana*) of Chile and Patagonia, from which it is distinguished by the practically non-ciliate scales, shorter culms and leaves, scales longer than or equaling the perigynia, and margins of the perigynia not hispidulous in the lower 2/3.

This is a most remarkable plant, there being no locality previously recorded between Venezuela and Chile for a species of the *U. brevicaulis* affinity. This is a similar case to that of the composite *Lagenophora*, originally known in South America from Chile and Argentina, and later discovered on the páramos of Venezuela (*Steyermark 57501*), described by Badillo as *L. andina*. It also simulates the distribution of another cyperaceous genus, *Oreobolus*, in which a new species has been found recently in Venezuela (*Steyermark*

57198), which is related to one originally described from Chile and Argentina, and more recently collected in Peru, Ecuador, and Colombia. Remaining species of *Lagenophora*, *Oreobolus*, and some species of *Uncinia* are encountered in Australia, New Zealand, Tasmania, the Sandwich Islands, Borneo, New Guinea, and (or) the Hawaiian Islands. Such distributions reveal ancient geological connections, and indicate that these isolated páramo-inhabiting

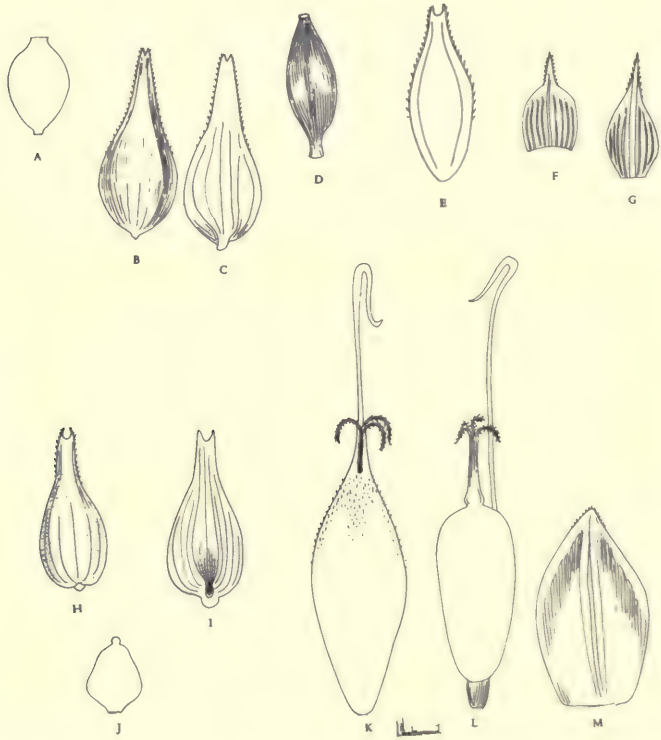

FIGURE 7

A, *Carex roraimensis*. Achene (X 6); B, *Carex roraimensis*. Perigynium, ventral view (X 7); C, *Carex roraimensis*. Perigynium, dorsal view (X 7); D, *Carex culmenicola*. Achene (X 9); E, *Carex culmenicola*. Perigynium (X 7); F, *Carex culmenicola*. Pistillate scale (X 5); G, *Carex culmenicola*. Pistillate scale (X 5); H, *Carex turumiquirensis*. Achene (X 7); I, *Carex turumiquirensis*. Perigynium, ventral view (X 7); J, *Carex turumiquirensis*. Perigynium, dorsal view (X 7); K, *Uncinia meridensis*. Perigynium (X 7); L, *Uncinia meridensis*. Achene with perigynium removed (X 7); M, *Uncinia meridensis*. Pistillate scale (X 4).

species may go back a long time in geological history for their original segregation and ancestral home.

Vesicarex Steyermark, gen. nov.

Folia evaginantia, ligulo marginibus cartilagineis. Flores dioicae. Stigmata 2. Stylus rectus. Squamae cucullatae incurvatae, infra apicem coalescentes, hyalinae. Flores foemineae cacumene appendiculata carnosa. Perigynia 2-parietina.

Leaves sheathless, ligules grass-like with cartilaginous margins. Flowers dioecious. Stigmas 2. Style straight, persistent at base. Scales cucullate-incurved, margins joined below apex, hyaline. Pistillate flowers subsessile, the summit of perigynium crowned by a whitish fleshy somewhat lobed appendage. Perigynia with the pericarp apparently 2-layered, separating at maturity into a whitish somewhat thickened inner membrane, surrounding the achene, and a firmer outer layer.

The generic name, from *vesiculus* or *vesica*, refers to the extra sac-like membrane or inner layer of the pericarp which encloses the achene.

Vesicarex collumanthus Steyermark, sp. nov.

Planta caespitosa acaulescens vel subacaulescens; foliis glaucis caeruleo-viridibus patentibus, supra sulcatis, subtus prominente costatis, 1.3 cm. longis, 1-2.5 mm. latis, glabris vel marginibus et costa inferiore scabridis; ligulo ore brunneo obtuso; floribus foemineis subsessilibus; spiculis capitulis ovoideis 4-floris, 4 mm. longis, 2 mm. latis; squamis flores subtendentibus hyalinis, 3.75-5.5 mm. longis, 3 mm. latis, ovatis cuspidatis; appendice 0.5 mm. longo; perigyniis subcapitatis congestis terminalibus, 4.5-5.5 mm. longis, 1.5-2.25 mm. latis, plano-convexis, biconvexis, vel obscure trigonis, 2-angulatis, elliptico-oblongis, glabris basi rotundatis, sensim in rostrum attenuatis, ore bidentato; achaenio lenticulari-subtereti vel trigono, ovato- vel late oblongo-elliptico, 2-3 mm. longo, 1.2-1.5 mm. lato, superne et inferne angustato, minute puncticulato.

Plant in dense rosettes; leaves subcoriaceous, complicate, the lower crowded portions of the sheathless leaves subimbricate, membranaceous, whitish, 10-nerved; orifice conspicuously protruded upward; pistillate flowers subsessile or shortly pedicellate, the pedicels about 0.5 mm. long; spikelets terminal; pistillate scales with central midrib prominent, the other 2 lateral nerves scarcely prominent, shorter than the perigynia, but as broad as and clasping the perigynia at the base; perigynia firmly membranaceous, congested, fulvous- or olivaceous-brown, somewhat shining, faintly 3-4-nerved on one side, rather obscurely or not nerved elsewhere; achene about half filling the perigynium, lenticular-subterete when immature, trigonous when mature, dark brown (Fig. 8, a - f).

Type in herb. Chi. Nat. Hist. Mus., collected on margin of alpine lake at El Aguila, above Páramo de Mucuchíes, state of Mérida, alt. 4025 m., July 6, 1944, *Julian A. Steyermark 57040.* Also collected near upper limit of páramo, around small lake, between Chachopo and Los Apartaderos, near El Aguila, state of Mérida, alt. 3930 m., April 16, 1944, *Steyermark 55875a.* Also collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary,

FIGURE 8

A, *Vesicarex collumanthus.* Pistillate scale (X 6); B, *Vesicarex collumanthus.* Perigynium (X 5); C, *Vesicarex collumanthus.* Achene (X 9); D, *Vesicarex collumanthus.* Pistillate flower (X 13); E, *Vesicarex collumanthus.* Appendage at summit of perigynium (X 30); F, *Vesicarex collumanthus.* Leaf with ligule and sheath (X 1.5); G, *Carex larensis.* Perigynium (X 9); H, *Carex larensis.* Achene (X 9); I, *Carex tachirensis.* Tip of leaf (highly magnified). J, *Carex tachirensis.* Margin of leaf (highly magnified; K, *Carex tachirensis.* Pistillate scale (X 8); L, *Carex tachirensis;* Perigynium (X 8), M, *Carex tachirensis.* Achene (X 8);

state of Táchira, alt. 3045-3475 m., July 15, 1944, *Steyermark 57370*, fruiting specimen.

The specific name refers to the collar-like apical appendage of the perigynium.

This genus may be separated from *Carex* and related segregates, such as *Cymophyllus* (if that is considered generic), by the combination of sheathless leaves, the peculiar grass-like ligule with cartilaginous margin, cucullate-incurved scales with the margins joined below apex, apparently dioecious flowers, the peculiar whitish fleshy lobed appendage at the summit of the young perigynium, and the double-layered pericarp, which separates into an inner whitish membranous layer surrounding the achene, and the outer firm part of the pericarp proper. This inner layer becomes separated and stands between the achene and the perigynium proper at maturity, but in the younger flowers appears to be part of the inner part of the pericarp. The peculiar appendage crowning the perigynium appears to be separated from the perigynium proper, and not a direct continuation of it, such as the beak in *Carex*. In *Carex* I have not found this 2-layered type of perigynium or the peculiar collar-like appendage which appears to be separate from the perigynium.

Carex culmenicola Steyermark, sp. nov.

Planta subcaespitosa; culmis 30-45 cm. altis, foliaceis, trigonis, glabris; foliis 15-30 cm. longis, 3-5 mm. latis, marginibus scabridulo-serrulatis; spicis pluribus, superioribus masculinis, inferioribus foemineis, 4-8 cm. longis; bracteis foliaceis, erectis, 9-15 cm. longis, 4 mm. latis, longe vaginatis, vagina 8-20 mm. longa; glumis masculis ovatis vel late oblongis, abrupte aristatis, 2.5-3.5 mm. longis, 1-1.5 mm. latis; glumis foemineis late ovatis vel suborbiculari-ovatis, aristatis, 2.7-3 mm. longis, 1.5-1.8 mm. latis; stigmatibus 3; perigyniis trigonis, ellipticis, sensim in rostrum brevem scabridulum attenuatis, 3.25-3.5 mm. longis, 1 mm. latis, marginibus scabris, ore bidentato; achaenio trigono, elliptico-oblongo, stipitato, 2 mm. longo, 0.75 mm. lato.

Leaves erect, prominently sulcate on upper side along center; pistillate spikes on stout, erect peduncles, 4-8 cm. long, the rachis scabrid-serrulate; lowest bracts shorter or nearly equaling the upper spikes; sheaths tight, the truncate ligule up to 5 mm. long; staminate scales pale to stramineous-brown, with elongate streaks, the aristae serrulate-scabrid; pistillate scales 10-12-striate with pale striations, rufous-brown with whitish hyaline margins and pale midrib, speckled and streaked with reddish-brown; perigynia firm, closely enveloping the achene, not inflated, conspicuously thickened along margins, one side concave, the other two more or less plane, olivaceous-brown, longer than the subtending scales, 3-nerved ventrally, two of the margins scabrid from below the middle to apex of beak; beak about 1 mm. long, nearly as long as or more than half as long as body;

style jointed to achene; achene long-stipitate, castaneous-brown, the sides concave (Fig. 7, d-g).

Type in herb. Chi. Nat. Hist. Mus., collected on rocky sandstone summit of eastern peak, Cerro Turumiquire, state of Sucre, alt. 2500 m., May 6, 1944, *Julian A. Steyermark 62605.*

Apparently a member of the section *Elatae*, and the second species of this section known from the western hemisphere, the other being *C. Bermudiana* Hemsl. From the latter this new species differs in the rootstocks not elongated, narrower and more branched pistillate spikes, shorter and fewer-ribbed perigynia scabrid on two of the margins from below the middle to the apex of the beak, smaller pistillate and staminate scales, and shorter achenes. Another related species is *C. Dianae* Steud. of the Island of St. Helena.

Mackenzie[9] states that the group is "represented by numerous species in Africa and the islands adjacent. One Australian, one Asiatic, and two species in the temperate and warmer parts of Europe are also referred here. Represented in the western hemisphere by one very local species in Bermuda." The occurrence of this new species on a remote peak in eastern Venezuela adds another endemic, allied most closely to the two species, *C. Bermudiana* of Bermuda, and *C. Dianae* of St. Helena. It may possibly represent a survivor pointing to a former geological relationship between Europe, Africa, and South America.

Carex larensis Steyermark, sp. nov.

Planta caespitosa; culmis 3-3.5 mm. altis, 1.5 mm. latis, glabris; foliis 4-15 cm. longis, 3 mm. latis, marginibus scabrido-serrulatis; spicis 4-5, terminalibus masculis, ceteris foemineis; bracteis foliaceis, 4-11 cm. longis, 2.5 mm. latis, longe vaginatis, vagina ventrali saepe paullo transverso-rugulosa et albo-hyalina; spiculis masculis solitariis anguste oblongis, 1 cm. longis; spiculis foemineis approximatis vel inferioribus remotis, late oblongis, 6-12 mm. longis, 5-6 mm. latis, erectis; glumis foemineis late ovatis, obtusis vel acutis, 2 mm. longis; stigmatibus 3; perigyniis obscure trigonis, ovatis vel elliptico-ovoideis, 2-angulatis, paullo abrupte in rostrum sparse scabridulum contractis, 3 mm. longis, 1.5 mm. latis, glabris, patento-adscendentibus, ore bidentato; achaenio trigono obovato, substipitato, 1.25-1.5 mm. longo, 1 mm. lato.

Culms stiff, much exceeding the leaves; leaves more or less bunched at base, the well-developed blades many to a culm, not septate-nodulose, rather stiff; inflorescence 1.5-5.5 cm. long, of 4-5 spikes, sessile, except for the lowest which is pedunculate; bracts exceeding the culms, the lowest the longest; sheaths smooth, concave at orifice with short ligule; pistillate spikes closely 30-45-flowered; pistillate scales shorter than the perigynium but about as

[9]Mackenzie, K. K. N. Am. Fl. **18**, part 5: 309. 1935.

wide, pale or ferruginous-brown, margins narrowly hyaline, the central portion broad, 3-nerved; perigynia firmly membranaceous, pale brown, olivaceous, or pale brownish-green below, prominently several-nerved, narrowed below to an obtuse or rounded base; beak 1 mm. long and 1/2-3/8 length of perigynium, 1/2 or slightly over 1/2 length of body; achene rounded and broadest above the middle, convex above, concave below, gray- or purplish-brown (Fig. 8, g-h).

Type in herb. Chi. Nat. Hist. Mus., collected in swampy meadow, between Buenos Aires and Páramo de las Rosas, state of Lara, alt. 2285-3290 m., February 11, 1944, *Julian A. Steyermark 55470*; also same locality, *55467*. Vernacular name: "pajilla de montaña".

A member of Kükenthal's section *Spirostachyae* Drejer and treated by Mackenzie under section *Extensae* Fries, this species is related to *C. extensa* Good. and *C. fuscula* D'urv. From *C. extensa* it differs in the smaller achenes which are more conspicuously broadened above the middle, while from *C. fuscula* and varieties of southern South America it differs in the obtuse non-ciliate pistillate scales, and the smaller, obovate, upwardly broadened achenes. The achenes of *C. extensa* are described as being yellow-brown, and of *C. fuscula* as yellow-green, but ones with purple-brown color may also be found in those species.

Steyermark 55467 is apparently a dwarfed plant of this species, but with shorter culms and leaves, shorter inflorescence, and smaller pistillate spikes.

Carex roraimensis Steyermark, sp. nov.

Planta caespitosa; culmis 70-80 cm. altis, trigonis, infra capitulum scabridulis, folia excedentibus; foliis 12-25 cm. longis, 2.5-3 mm. latis, marginibus minute serrulatis, vaginis ore productis; spicis gynaecandris subglobosis vel breve oblongis, 7-8 mm. longis, 4-5 mm. latis; bractea erecta, 2.5-4 cm. longa, 0.5-1 mm. lata; glumis ovatis acutis, 2.8-3 mm. longis, pallide viridibus, perigyniis brevioribus; stigmatibus 2; perigyniis oblongo-lanceolatis, basi substipitatis, sensim in rostrum scabridulum attenuatis, marginibus paullo alatis, 3.5 mm. longis, 1.25-1.5 mm. latis, undique moderatim vel valde nervatis, pallide viridibus, ore bidentato; achaenio lenticulari, obovoideo-oblongi, substipitato, 2 mm. longo, 1 mm. lato.

Sterile culms absent or poorly developed; fertile culms triquetrous; leaves erect-ascending, becoming foliose about 25 cm. above base, well-developed blades 5-6 to fertile culm; sheaths pale brown around orifice, rather tight and white-hyaline ventrally; inflorescence erect or slightly flexuous, 2-2.5 cm. long, 0.8-0.9 cm. wide; spikes 5-6, approximate, subclavate at base, rounded above, the basal staminate flowers few and inconspicuous; perigynia 12-20 in a spikelet, ascending; bract stiff, prolonged, equaling or longer than the inflorescence; scales pale greenish-white with a pale green center, narrowed above, exposing the upper part of the perigynia; perigynia concavo-convex,

the body widest just below the middle, membranaceous, pale to silvery green, tapering into a beak about equaling the length of the body, the beak flat, scabrid from middle to apex; style straight, slender, jointed with achene, at length deciduous; achene somewhat narrowed above, yellow-brown (Fig. 7, a-c).

Type in herb. Chi. Nat. Hist. Mus., collected in spongy soil with dense mats of vegetation in depression of morro, summit of Mount Roraima, on southern half of the summit between Summit Camp, Great Central Rift, Central Swamp, and pond at southern end, state of Bolivar, alt. 2700-2740 m., September 28, 1944, *Julian A. Steyermark 58870.*

This species is characterized by the greenish-white perigynia and scales, perigynia broadest in lower half and relatively narrow achenes 2 mm. long, culms scabridulous below the heads, poorly developed sterile culms, and elongated bract of inflorescence. It is placed here in section *Ovales*, because of the wing-margined perigynium, which is not spongy-thickened at base.

This is the second member of the group *Ovales* to be recorded from South America, *C. Longii* Mack. (*C. albolutescens*) being the other. It is the first of the group belonging to the sections *Festucaceae* or *Fetae*, as treated by Mackenzie in the North American Flora, to be recorded from South America, since Mackenzie placed *C. Longii* in section *Alatae*.

Although I have not seen the specimen, this is apparently the plant from the summit of Roraima (*Ule 8536*) reported by Kükenthal, in Engl. Bot. Jahrb. **56.** Beibl. **125**: 25 (1921), as *C. Bonplandii* Kunth. However, careful study of our material shows that it is not *C. Bonplandii*, nor even in the section to which that species belongs. From *C. Longii* this new species may be distinguished by the narrower perigynium, not broadest above the middle, the longer beak and achene. Its elongate bract, together with other characters of the perigynium, distinguishes it from *C. tenera*, *C. normalis*, *C. molesta*, and *C. feta*, all of which it resembles. From the members of the *Athrostachyae* and *Cyperoideae*, in which the bracts are either leaflike or conspicuously exceed the head, this species differs in the heads not congested, and either paler-colored scales, or different shape and size of perigynium. From *C. foenea*, which has an elongated bract of the inflorescence, this species differs in having the sterile culms poorly developed, narrower perigynia, larger achenes, and beak larger in proportion to the rest of the perigynium.

Carex tachirensis Steyermark, sp. nov.

Planta caespitosa; culmis in anthesi 3.5-8 cm. altis, in fructu 15 cm. altis, angulis scabridulis 2-bracteatis; foliis erectis, coriaceis, basi aggregatis, linearibus, obtusis, 3-5 cm. longis, 1-1.5 mm. latis, marginibus et superne per margines partis canaliculatae subtilissime denseque setulosis evaginantibus; spica simplici androgyna, apice

mascula anguste lineari, 11-17 mm. longa, 1 mm. lata; bracteis 2, longe aristatis, bractea superiore 18 mm. longa, breve vaginata, bractea inferiore 17-25 mm. longa, vagina 6.5 mm. longa; glumis masculis ovatis, acuminatis, 3 mm. longis, 1.2-2 mm. latis; glumis foemineis late ovatis vel lanceolatis, breve acuminatis vel longe aristatis, 3.5-7 mm. longis, 1.5 mm. latis, apice et marginibus superioribus parce setulosis, aliter glabris; stigmatibus 3; perigyniis obscure trigonis, lanceolato-ellipticis, breve stipitatis, 2-angulatis, 14-nervatis, longe rostratis, 3.75 mm. longis, 1 mm. latis, glabris, ore bidentato; achaenio (immaturo) elliptico-oblongo, longe stipitato.

Leaves finely many-nerved, bases of the blades many-nerved and becoming fibrillose in age; spike pseudolateral, the staminate portion small, densely flowered, 5 mm. long, pistillate portion rather laxly flowered, 8-11 mm. long; staminate scales purplish-castaneous on outer margins, yellowish-green along midrib and central part, the margins incurved; lowest pistillate scales long-aristate, the awn 3-3.5 mm. long and setulose on margins, all the scales 3-nerved, castaneous on outer margins, pale green along midrib and central part; stigmas short, about 1.5 mm. long; perigynia firmly membranaceous, with nerves raised on surface; achene (immature) about filling the perigynium, laterally compressed (Fig. 8, i-m).

Type in herb. Chi. Nat. Hist. Mus., collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary, state of Táchira, alt. 3045-3475 m., July 15, 1944, *Julian A. Steyermark 57367.*

A member of the subgenus *Primocarex*, as defined by Kükenthal, on account of the single terminal spike. It is a member of either section *Circinatae* or section *Unciniaeformes*, but it is difficult to state whether the pistillate scales are quickly caducous or not. From *C. anthoxanthea* Presl and *C. circinata* C. A. Mey., of northern North America, this is distinguished by the cespitose rhizomes, acuminate pistillate and staminate scales, and short rigid leaves, while among the members of the section *Unciniaeformes* its relationship would be closest to the bracteate-spiked subsection *Aciculares*, as defined by Kükenthal, and especially close to *C. vallis pulchrae* Phil. of Chile and Argentina because of the 3 stigmas. From this last species it differs in its narrowly linear, longer spike, and straight, not curved, culms.

The outstanding characters of this new species are the combination of the narrowly linear, single, terminal, androgynous spike, 2-bracteate erect culms, short, erect, rigid, canaliculate, setulose-margined and channelled leaves, relatively long, bidentate beaks, glabrous, prominently nerved perigynia, short acuminate scales which are minutely setulose on upper margins and tips, and densely cespitose habit.

Carex tamana Steyermark, sp. nov.

Stolonifera; culmis 10-50 cm. altis, foliaceis, glabris; foliis erectis, anguste linearibus, 10-40 cm. longis, 2-4.5 mm. latis, supra saepe scabridulis; spicis 4-5, terminalibus masculis, ceteris foemineis approximatis, erectis, sessilibus vel subsessilibus, confertis, 1-3 cm. longis, 2-5 mm. latis; bracteis foliaceis, erectis, inflorescentiam excedentibus, 5-15 cm. longis, 2-3.5 mm. latis, evaginantibus; glumis masculis lanceolatis, acuminatis, carinatis, 5.5 mm. longis, 1 mm. latis; glumis foemineis ovatis vel lanceolatis, acutis vel acuminatis, carinatis, 4-4.5 mm. longis, 2-2.5 mm. latis, glabris; stigmatibus 3; perigyniis paullo biconvexis, erectis, anguste elliptico-fusiformibus, 2 nervis marginalibus abrupte anguste rostratis, 6 mm. longis, 1.5 mm. latis, rostro 1.5 mm. longo, ore bidentato; achaenio trigono, elliptico-oblongo, 2.25 mm. longo 1 mm. lato.

Leaves rigid, equaling or longer than the culms, glabrous, or the upper surface often scabridulous; staminate scales with narrowly hyaline margins; pistillate scales membranaceous, the prominent midnerve bordered on each side by a cellular portion; perigynia exceeding the scales, membranaceous, dull brown-olivaceous, tapering gradually below to a narrow base, shining; achene not filling the perigynium, with concave sides; style bent at base, continuous with achene.

Type in herb. Chi. Nat. Hist. Mus., collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary, state of Táchira, alt. 3045-3475 m., July 15, 1944, *Julian A. Steyermark 57401*; also same locality, *Steyermark 57369*.

A member of the subgenus *Eucarex*, section *Hymenochlaenae*, as treated by Kükenthal, this species is characterized by its glabrous leaves, culms, and perigynia, the single terminal, staminate spike, subsessile, lateral pistillate spikes, sheathless, foliaceous bracts, and bidentate, erect, nerveless, 2-margined perigynia.

Carex turumiquirensis Steyermark, sp. nov.

Planta caespitosa; culmis 15-30 cm. altis, triquetris, angulis scabridulis; foliis 10-20 cm. longis, 1-2 mm. latis, plerumque culmis brevioribus, marginibus scabrido-serrulatis; spicis 2-5, gynaecandris, subglobosis vel breve oblongis, 4-8 mm. longis, 3-5 mm. latis; glumis foemineis ovatis, acutis vel breve aristatis, 1.75-2 mm. longis, ca. 1.25 mm. latis; perigyniis planis, ovato-oblongis, dorso prominente nervatis, antice paullo prope basem, abrupte in rostrum angustatis, 2.75 mm. longis, 1 mm. latis, rostro 1-1.25 mm. longo, ore bidentato, marginibus ventralibus incurvatis; achaenio lenticulari, ovato-suborbiculari, paullo longiore quam latiore, 1.3-1.4 mm. longo, 1 mm. lato.

Inflorescence 1.5-2.5 cm. long; spikes interrupted; pistillate scales yellow to dull brown with white-hyaline margins and a pale

green or darker brown midrib, often short-excurrent; stigmas 2; perigynia squarrose at maturity, brownish or yellow-brown or brownish-rufous, prominently nerved dorsally and somewhat ventrally near base; beak 1/2-3/4 length of perigynium body (Fig. 7, h-j).

Type in herb. Chi. Nat. Hist. Mus., collected in swampy meadow, on ridge dividing headwaters of Río Manzanares and Río de Amana, Cerro Turumiquire, state of Sucre, alt. 1900-2000 m., May 10, 1945, *Julian A. Steyermark 62705.*

This is the first South American record of a species that might be referred to *C. angustior* Mack. or the related *C. interior* L. H. Bailey. *Carex Bonplandii*, previously known from South America, is, of course, related to both of these species. The nearest locality to which the related *C. angustior* has been collected is in Santo Domingo, cited by Mackenzie in North American Flora, and in Chihuahua, Mexico, for *C. interior.* However, in *C. angustior* the beak is "more than half to about length of body", measuring longer than in our collection, and the achenes in that species are longer, being 1.75 mm. long and "ovate or oblong-ovate" (Mackenzie, N. Am. Fl. p. 113).

In *C. interior*, which Mackenzie cites as occurring as far south as the state of Chihuahua, Mexico, the beak is "about one third or one fourth the length of the body" and the achene is "broadly ovate-orbicular, 1.5 mm. wide." Our species is, therefore, somewhat intermediate between *C. interior* and *C. angustior*, if these can be considered as distinct species, and agrees more closely with the relative length of the beak in its relation to the body of the perigynium and to the shape and size of the achene of *C. angustior* than with *C. interior.*

To summarize, *C. turumiquirensis* differs from *C. interior* in its longer beak which is more conspicuously bidentate, acute to short-aristate scales, and narrower perigynium body with more incurved margins, while from *C. angustior* it differs in the shorter, somewhat more ovate-suborbicular achenes, and more prominently ventrally and dorsally nerved perigynia.

PALMAE

Bactris bergantina Steyermark, sp. nov.

Palma 5 m. alta, caespites formans, caudice 7.5 cm. crasso, aculeis nigris armata; petiolo 52-55 cm. longo, 1.3 cm. crasso, infra convexo rotundatoque, bicanaliculato carina acri, parte infima dense stramineo-furfuracea, partibus medianis et superioribus stramineo- vel fusco-furfuraceis squamis parvis et pilis fuscis, plerumque utrinque aculeis nigris; aculeis applanatis, nigris 7-30 mm. longis fasciculis flabellatis; rhachi aculeis minoribus et paucioribus; fronde 2.37 m. longa; pinnis utroque latere circ. 40 circ. 4-5 per greges nonnihil confertis, lanceolatis subfalcatis apice bidenticulatis supra glabris infra

per costam mediam et 1-2 nervos laterales linea squamorum fuscarum vestitis aliter glabris, inferioribus 55-65 cm. longis, 2.5-4 cm. latis, supremis 30-35 cm. longis, 2-3 cm. latis, ad marginem setoso-ciliata nigra; spatha 40 cm. longa cylindrica angusta extus fusco-tomentulosa, aculeis pluribus acicularibus subteretibus nigris 12-37 mm. longis dense confertis; spadice multiramoso tomentuloso; rhachi 21 cm. longa; pedunculo 13 cm. longo, 2 cm. crasso, robusto declinato aculeato, setis brevibus tenuibus; ramis numerosis 4-12 cm. longis, 2 mm. crassis; calyce fructifero annuliforme adpresso, margine subintegro, 4-4.5 mm. alto, 1 cm. diametro; drupa oblato-globulari vel turbinata, 18-19 mm. alta, 18-20 mm. lata, apice subtruncata ad basim subito angustata glabra.

Petiole 52-55 cm. long from base to lowermost pinnae, 1.3 cm. thick, convex and rounded below, bicanaliculate above with sharp keel, densely buff-furfuraceous in lowermost part, middle and upper parts less closely but conspicuously buff- or brown furfuraceous with minute scales mixed with brown hairs, densely black-spiny over most of length; spines on lower convex surface more prominent, arranged in fan-like clusters, black, those near base of rachis white-pubescent in lower part, those in upper and middle portions less noticeably pubescent below or glabrescent; spines on lower side in upper part of rachis smaller, 7-10 mm. long, less numerous, absent from uppermost portion of rachis; pinnae membranaceous, dull green both sides, in groups of 4-5, rather closely crowded, the uppermost alternate, narrowed above into a bidenticulate apex, with one side longer than the other, glabrous above except for black slender sparse setae 3-6 mm. long on midrib of uppermost ones, below midrib and 1-2 main lateral nerves covered with a line of brownish scales especially prominent at base of pinna, otherwise glabrous, lower pinnae 55-65 cm. long, 2.5-4 cm. wide, middle pinnae 65 cm. long, 4 cm. wide, uppermost pinnae 30-45 cm. long, 2-3 cm. wide; spathe long-cylindric, shortly exceeding the spadix, the brown-tomentulose surface thickly covered by numerous slender black spines; axis of rachis continued through most of length of spadix; fruiting clusters pendent, arising on old wood at base of leaf clusters; drupe at first dark green, turning purple, the edible white interior with coconut-like flavor.

xxType in herb. Chi. Nat. Hist. Mus., collected in woods along Río Leon by Quebrada Danta, tributary to Río Neverí, northeast of Bergantín, state of Anzóategui, alt. 500 m., February 20, 1945, *Julian A. Steyermark 61039.*

Local name: "Maquenilla". The woody part of the trunk serves for frames used in connection with hand-made Venezuelan sandals (*alpargata*). The *alpargatas* are woven with various colors of cotton thread, and started on a wooden support, which is derived in this section of Venezuela from the woody trunk of this species of *Bactris*.

In its combination of concolorous setulose-margined pinnae, which have 1 or 2 lines or nerves minutely buff-brown furfuraceous on the

lower surface, the rachis of the frond buff-tomentulose in the lower part to minutely brown-scurfy in the upper half, the upper surface of the uppermost pinnae with black setae on the midrib, the flattened spines, the bifurcation of the leaf tips into an equally bifid apex, and the many-branched spadix with its slender elongated densely spiny spathe, this species differs from *B. Sworderiana* Becc., *B. Cuesa* Crueger, *B. Lindmaniana* Drude, *B. littoralis* Barb., *B. setulosa* Karst., and *B. setosa* Mart. The flattened or nearly flattened spines on the rachis of the petiole, if this character is to be relied upon, separates *B. bergantina* from the closely related *B. Cuesa* of Trinidad and *B. Sworderiana* of Tobago. The pinnae in *B. Cuesa* are described as "glabrescent", and in *B. Sworderiana* as "utrinque glabris", but in *B. bergantina* there are 1 or more lines of furfuraceous or buff-brown or brown scales on the lower surface of the pinnae.

Bactris duidae Steyermark, sp. nov.

Caudex 3 m. altus, 1.5-2.5 cm. crassus, solitarius; fronde 0.7-0.8 m. longa; petiolo 33 cm. longo usque ad 5 mm. crasso prope basim fusco-furfuraceo vel tomentoso, inferne aculeis nigro-fuscis applanatis 3-18 mm. longis armato; lamina ultra medium (ad 2/3) simplice bifida, oblanceolato-obovata utrinque nervis primariis 10-12 percursa, 72-83 cm. longa, usque ad 17 cm. lata, infra glabra, ad margines setis tenuibus nigris 2-5 mm. longis dense ciliata; costa media glabra; laminae lobis late triangulari-lanceolatis, apice falcato-curvatis, 39-41 cm. longis, usque ad 11 cm. latis; spatha interiore elliptico-lanceolata acuta 13-15 cm. longa, 4.5 cm. lata, extus pallide fusco-tomentosa aculeis 6-9 mm. longis pallido-fuscis tenuibus subapplanatis dense vestita; spathae pedunculo 6-7 cm. longo supra dense fusco-tomentoso parce setuloso, infra saepe inermi; spadice multiramoso, 9 cm. longo, 7.5 cm. lato, ramis 9-11 tenuibus 5-7 cm. longis, circ. 1 mm. crassis, dense scrobiculatis minute parceque fusco-tomentosis, rhachi breviter producta 2.5 cm. longa; spadicis pedunculo 5 cm. longo, 4 mm. lato, dense tomentosopilis castaneis et moderatim vel parce aculeatis aculeis applanatis nigris 4-4.5 mm. longis; floribus foemineis: calyce tubulosa quam corolla longiore circ. 5 mm. longa, 2 mm. lata pluristriata glabra 3-denticulata, lobis late subtriangularibus; corolla 3.5-4 mm. longa apice truncata ad margines ciliata, intus pubescenti extus parce adpresso-setulosa setis pallido-brunneis; gynaeceo pyriformi, 8-9 mm. longo apice basi attenuato.

Petiole glabrous and unarmed in upper 2/3; lamina dull green both sides, broader above the middle and narrowed below, conspicuously nerved, the 6-7 secondary nerves occurring between the 10-12 primary nerves on each side; inner spathe often pubescent in lower part; axis of spadix produced only a short distance, not continued throughout inflorescence; peduncle of spadix moderately to sparsely aculeate with flattened spines black at base and brown above; branches of spadix densely scrobiculate where the flowers occur; staminate

flowers fallen, but occupying most of the sunken depressions of the rachis; pistillate flowers scattered on the branches: calyx longer and enveloping the corolla, tubular, the short broadly subtriangular lobes minutely apiculate; corolla scaly-pubescent within, sparsely short-appressed setulose without, many-striate; bract suborbicular-ovate, acuminate, 0.5 mm. long, 0.8-0.9 mm. wide, glabrous; young fruit or ovary pyriform, 8-9 mm. long, attenuate at apex and base (Fig. 9).

Type in herb. Chi. Nat. Hist. Mus., collected in forest near Base

FIGURE 9

Bactris duidae Steyermark

A, Frond (X1/10); B, Inflorescence with spathe (X1/10); C, Pistillate flower (X 3); D, Pistillate perianth opened (X 3);

River (Caño Negro), at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 215 m., August 23, 1944, *Julian A. Steyermark 57908.*

This species is characterized by the bifid elongate leaves, which are glabrous on the lower surface, the petiole aculeate near base, the densely brown-spiny spathe, and the many-branched spadix.

It is apparently related to *B. chaetospatha* Mart. of Amazonas, Brazil, from which it differs in the glabrous rachis and lower leaf surface, the aculeate base of the petiole, and the densely spiny spathe. From *B. armata* Barb. it differs in the much shorter spines of the petiole, which are confined near its base instead of scattered along the length. From other species of similar type, such as *B. longipes* Poepp., *B. fissifrons* Mart., *B. Luetzelburgii* Burret, and several others, it differs in the combination of characters mentioned above.

Bactris duidae is somewhat intermediate between *Bactris* proper and the group of species sometimes referred to *Pyrenoglyphis* (which is now considered by Bailey, Dahlgren, and others as a section of *Bactris*), forming a transition between *B. chaetospatha* and *B. bifida* Mart. The latter has a simple spadix, while the former has a many-branched inflorescence. Because of the lack of a staminodial ring in the pistillate flowers and the calyx not duplicate on the interior, this species should be placed with the section of *Bactris* relegated to *Pyrenoglyphis.*

Bactris Kamarupa Steyermark, sp. nov.

Caudex 3-3.75 m. altus, 5 cm. crassus, solitarius, aculeis canis applanatis 20-30 mm. longis 2-3 mm. latis armatus; frondibus 1.75 m. longis membranaceis; petiolo 70 cm. longo, 6 mm. crasso, supra canaliculato, fusco-furfuraceo, parte inferiore aculeis inaequalibus applanatis pallido-brunneis praeter apicem nigrum 0.9-3.5 cm. longis, 0.5-2.5 mm. latis armata; rhachi 1 m. longa, 2-6 mm. crassa, utrinque dense brunneo-furfuracea inermi; pinnis undique 10 vel 12 per greges 2-4 inaequaliter dispositis, falcato- vel sigmoideo-lanceolatis, ad apicem longi-acuminatis, terminalibus 27 cm. longis, 6-6.5 cm. latis, prope apicem dense setulosis, ceteris 30-48 cm. longis, 2.5-6 cm. latis, costa media prope apices asymmetrica, nervis primariis 6, supra glabris subtus basi costae mediae et ad nervos primarios et basi pinnae pallido-furfuraceis; spatha 11-12 cm. longa dense pubescenti setis nigro-fuscis et pilis atrofuscis et aculeis basi fuscis applanatis lanceolatis vel ovato-lanceolatis 7-13 mm. longis intermixtis; spadicis fructiferae pedunculo pendenti curvato, 14 cm. longo, 7-8 mm. crasso, parte superiore dense atrofusco-setuloso-hispidulo pilis adpressis tenuibus; spadicis rhachi brevi, 1.5 cm. longa, ramis 9, 5-7.5 cm. longis, 2.5-3 mm. crassis, brunneo-furfuraceo-pubescentibus scrobiculatis; calyce fructifera duplico, exteriore minore 3-4 mm.

longa, 7.5 mm. lata, 3-lobata, lobis 3-4 mm. latis rotundatis sparse hispidulis, supra pilis fusco-nigris pluristriatis ad margines scariosis, interiore 5-6 mm. longa, 11-12 mm. lata, irregulariter 5-7-lobata, lobis 2.5-3 mm. longis, 2-3 mm. latis, rotundatis moderatim vel tenuiter hispidulis, pilis nigris vel fuscis ad margines scariosis; drupa subgloboso-oblata vel late turbinata, apice subtruncata, 15-16 mm. alta, 18-21 mm. lata, glabra tenuiter pluristriata.

Stems armed with pale spines arranged in fan-like groups; fronds dark green above, dull green below; pexiole moderately armed in lower half with flattened unequal spines, pale brown except black at base and tip, these densely scattered over the basal 30 cm., but sparse and irregular in the next 30 cm., absent beyond this, all parts of the rachis densely dark brown scurfy-furfuraceous; pinnae 10 pair on one side, 12 on the other, unequally arranged and interrupted with gaps of 10-20 cm. along rachis, the pinnae arranged in groups of 2-4; terminal pinnae widely divergent at a 60^0 angle, densely setulose near apex; middle pinnae 37-47 cm. long, 4.5-6 cm. wide, conspicuously narrowed and curved to the base, lower pinnae 30-48 cm. long, 2.5-6 cm. wide, the main midrib mostly in center of pinna, but becoming asymmetric or towards one side near either end of the pinnae; primary nerves 6, glabrous above, below buff-furfuraceous at base of and (or) on main midrib and on some of primary nerves at base of pinnae, otherwise glabrous below, sometimes portions of the surface minutely scurfy, the margins of the apices and upper portion black setulose with slender setae 1.5-2.5 mm. long; spathe densely pubescent with dark brown hairs and black-brown setae mixed with flattened membranaceous spines which are long-attenuate at apex, brown and buff-scarious on margins, dark brown at base; axis of rachis of spadix not produced through the inflorescence, but terminating shortly, the branches of the spadix scrobiculately marked by the locations of the flowers; fruiting calyx double, the outer smaller; fruit purple-black, edible, with sweetish-acid juice, subtruncate at apex, abruptly tapering to a slightly raised central mound, apiculately tipped, the central mound about 8 mm. in diameter and marked by a circular depression, gradually attenuate at base, the body of the fruit 18-21 mm. broad.

Type in herb. Chi. Nat. Hist. Mus., collected in lower portion of Quebrada O-paru-má, tributary of Río Pacairao, below Santa Teresita de Kavanayen, state of Bolívar, alt. 915-1065 m., November 25, 1944, *Julian A. Steyermark 60542*.

Local name: "Kamar-ba-yek". The trunk of this palm is used locally by the Indian inhabitants for the terminal portion of the arrow (*Kamarba*), the other part of the arrow being known as "*purau*".

The specific name is taken from the Pemón language of the Taurepán Indians of Ptari-tepuí, the word "kamarupa" signifying a spiny tree used for making arrows. Although the name for the tree was given apparently as "kamarba", it seems preferable to employ the more generally known word "kamarupa".

This species somewhat approaches *Bactris Gastoniana* Barb., but differs in the leaf rachis, which is smooth except at the basal part, shape of the drupe, greater number of pairs of pinnae, long spiny stem, pale spines of the stem, and other differences. From *B. aristata* Mart. it differs in its many-branched spadix and rachis armed at base; from *B. rivularis* Barb. it differs in the shape and number of the pinnae, and other particulars, while from *B. maraja* Mart. it differs in the fuscous-pubescent rachis which is aculeate only at base, in the larger number of pinnae, and the shorter spadix. It is characterized by the scurfy-furfuraceous leaf rachis which is unarmed except at base, the sigmoid oblanceolate long-falcate pinnae acuminate at apex, the long pale-colored spines arranged in fan-like groups on the stems, the densely spinose spathe, and the short several-branched spadix.

Bactris ptariana Steyermark, sp. nov.

Caudex 6-9 m. altus, 5-10 cm. crassus, solitarius, ad annulos aculeis nigris 4-32 mm. longis dense aggregatis armatus; fronde 1.91 m. longa; vagina fusco-tomentosa aculeis brevibus 0.6-2 cm. longis applanatis; petiolo 55-60 cm. longo basi 4 cm. lato; rhachi infra prope basem aculeis nigris dense aggregatis annulatis minoribus et majoribus; pinnis inermibus utrinque 40 plus minusve regulariter dispositis subopposítis concoloribus lineari-lanceolatis tenuiter acuminatis, 55-85 cm. longis, 1-3 cm. latis, supra glabris infra omnibus nervis hispidulis; spadice 15-22 cm. longo, usque ad 10 cm. lato, ramulis 20-25, 13-17 cm. longis, 2-3 cm. crassis dense hirtellis; pedunculo 18 cm. longo, 15 mm. lato, supra inermi dense pallido-velutino infra setis brevibus nigro-fuscis dense vestito; spatha fusiformi clavato-acuta, 40-48 cm. longa, parte inferiore usque ad 7 cm. lata, aculeis densis brevioribus fuscis vel castaneis et longioribus intermixtis nigris patentibus obtecta, dense velutina; floribus masculinis cum foemineis intermixtis ad ramorum apices aggregatis, breviter pedicellatis, pedicellis 0.8 mm. longis glabris: calyce 1 mm. longa, 3 lobis late triangularibus obtusis 0.8 mm. longis, 0.6-0.7 mm. latis, glabris fusco-maculatis lineolatis; corolla ultra medium divisa, 3 lobis ovatis superne subito angustata 2 mm. longis, 1.5 mm. latis, apice fusco-maculatis; staminibus 6, filamentis tenuibus glabris, 1.2 mm. longis; antheris oblongis, 0.8-0.9 mm. longis; floribus foemineis: calyce 0.8-1.1 mm. longa, 3.5 mm. lata, 3 lobis fere obsoletis; corolla 3 mm. longa, 3 mm. lata, 3 lobis late triangularibus subcuculatis obtuse apiculatis, parce stipitato-glandularibus obtecta; drupa obovoidea, 11 mm. longa, 11 mm. lata, glabra plerumque calva apice apiculata.

Spines on trunk densely clustered in annulate arrangement, the trunk annulate about 3 cm. between the spines; frond subcoriaceous to firmly membranaceous, deep green above, dull green below; rachis of frond concave above at very base, convex below, in lower and middle parts convex below, carinate and bifacial above, the lower

portion armed on both surfaces with flattened black spines 2-6 cm. long, 1 mm. wide, these more or less furfuraceous at or near the base, middle part of rachis with the lower convex side spinose with aggregations of black spines 1.5-3.5 cm. long, mixed at the base with small, slender, black or gray scales and (or) hairs, the upper carinate side without spines, the upper part of rachis with shorter black spines 0.4-1.1 cm. long on the lower surface mixed with short, black-brown hairs and scales, spineless on the upper side, the uppermost part of rachis spineless on the lower side with only small clusters of blackish scales; spines at base of rachis on lower surface arranged in fan-like aggregations; pinnae 2-ranked, the uppermost ones with 6 primary nerves on each side, the lower and middle ones with 8-10 on each side, all the nerves on lower surface hispidulous with tiny brown appressed scales at base of hairs, lower pinnae 78-85 cm. long, 1.5-2 cm. wide, middle ones 75-85 cm. long, 2-3 cm. wide, uppermost ones 55-60 cm. long, 1-2 cm. wide, some pinnae sparsely and remotely setulose-ciliate, otherwise entirely unarmed; inflorescence erect, arising at base of leaf sheath; rachis creamy white; flowers yellow (Fig. 10).

Type in herb. Chi. Nat. Hist. Mus., collected in forest near "Misia Kathy" camp, on southeast-facing slopes of Ptari-tepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 60046.* Also collected on lower southeastern slopes of Carrao-tepuí, state of Bolívar, alt. 1675-1980 m., December 5-6, 1944, *Steyermark 60869.*

Local name: "Moi-ye-kai-yek".

This species shows a relationship to *B. longisecta* Burret, *B. balanophora* Spruce, *B. littoralis* Barb., *B. glaucescens* Drude, *B. bidentula* Spruce, *B. megistocarpa* Burret, *B. setosa* Mart., and *B. vulgaris* Barb., but differs from them by its combination of solitary trunk, dense fan-like clusters of long, black spines on lower surface of rachis and petiole, the long, black spines densely covering the spathe, the unarmed rachis of the inflorescence which is much branched and densely hirsutulous, the regularly many-pinnate frond with narrowly linear-lanceolate, concolorous pinnae which are densely hispidulous on the nerves of the lower surface, the glabrous fruit, and the minutely stipitate-glandular, otherwise glabrous, pistillate corolla.

Bactris sororopanae Steyermark, sp. nov.

Caudex 1.7-1.9 m. altus, 9-10 mm. crassus, solitarius, aculeis brevibus tenuibus nigris, 3-4 mm. longis; frondis vagina fusco-tomentosa aculeis brevibus tenuibus 3-5 mm. longis apice fusco-setosa; lamina 25-27 cm. longa, 18 cm. lata; petiolo 10-15 cm. longo, 3 mm. crasso, inermi ancipitali costato pallido-brunneo tomentoso-leproso; rhachi fusco-leprosa 10-12 cm. longa; pinnis utrinque 5-6 irregulariter proxime dispositis alternatis vel suboppositis sigmoideis lanceolatis apice longi-acuminatis superne curvatis, 12-16 cm.

longis, 1.7-4.5 cm. latis, utrinque glabris vel infimis infra saepe fusco-leprosis ad margines prope apicem aculeis nigris tenuibus; spadice 3 cm. longa, in axillis, mox pendenti; rhachi unica et simplice glabra, floribus et fructibus spissis; spatha inermi 3-3.3 cm. longa furfuracea glabrescenti mox in partes longitudinales divisa; calyce quam corolla breviore persistenti, 3 lobis late ovatis apice rotundatis, 2.5 mm. longis, 2-2.5 mm. latis pluristriatis, extus glabra scariosa; corolla persistenti, 3 lobis ovato-suborbicularibus apice obtusis 3.5-4 mm. longis, 3.5-4 mm. latis, pluristriatis, extus glabra scariosa; drupa subgloboso-ovata, rostro brevi, glabra, 1 cm. longa, 9 mm. lata.

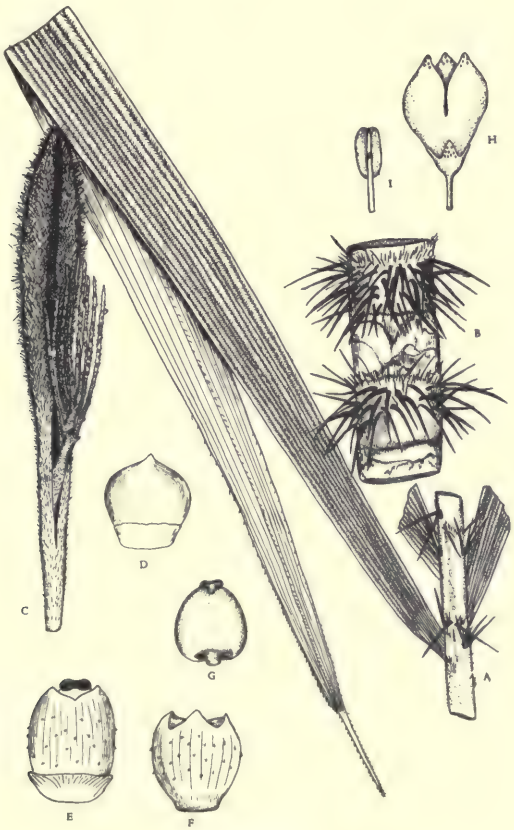

FIGURE 10

Bactris ptariana Steyermark

A, Portion of middle section of frond (X 1/3); B, Portion of trunk (X 1/3); C, Inflorescence with spathe (X 1/6); D, Fruit (X 4); E, Pistillate flower (X 4); F, Pistillate corolla (X 4); G, Pistil (X 4); H, Staminate flower (X 4); I, Stamen (X 4).

Pinnae chartaceous, deep green above, dull green below, irregularly but closely disposed, proximate, sigmoid, the apex upwardly curved and long-acuminate, the terminal pair, and sometimes the lowest pair, the longest, the midrib prominent, but shifting from central to the other side near the ends of the pinnae, primary ribs 1-2 on each side; spathe furfuraceous, becoming glabrescent; drupe green, filled with a homogeneous seed.

Type in herb. Chi. Nat. Hist. Mus., collected in woods bordering savanna, along Río Karuai, at base of Sororopán-tepuí, west of La Laja, state of Bolívar, alt. 1220 m., November 29, 1944, *Julian A. Steyermark 60781.*

Local name: "Moy-ye-ki-yek". A game is sometimes played with the stems of this species. An Indian that can pull the tough stem from the ground thereby gives proof of his strength or force.

This species is related to *Yuyba Maguirei* Bailey (Bailey, L. H. Bull. Torr. Bot. Club **75**: 106. 1948.) = **Bactris Maguirei** (Bailey) Steyermark, comb. nov. I cannot agree with Bailey that these diminutive palms should constitute a genus distinct from *Bactris*. The dwarfing of general stature, together with its associated smaller size of spathe, peduncle, and reduction of spines on the trunk, should not be regarded as generic characters. They might, on the other hand, be considered as setting off a distinct section within the genus. Both *Yuyba* and *Bactris* have 6 stamens, and *Bactris* may have even 9 or 12.

From *B. Maguirei* this new species differs in its more densely brown-scurfy leaf rachis, the tips and upper margins of the pinnae more closely black-setulose, the shorter spathe and spadix, the more closely crowded pinnae, and the somewhat shorter spines of the stem and leaf sheath.

From *B. microspadix* Burret, it may be distinguished by the smaller peduncle of the inflorescence, the shorter petiole not spiny at base, and the shorter spathe and pinnae, while the simple spadix, brown-furfuraceous leaf rachis, and the number of pairs of pinnae differentiates it from *B. microspatha* Barb. It is closely related to *B. mitis*, which, however, has a 2-3-fid spadix with glabrous rachis, an unarmed leaf sheath and rachis, and 6,8-10 pairs of pinnae not as closely set together as in *B. sororopanae*. From the closely related *B. paucisecta* Burret of British Guiana, the new species differs in the tomentose or furfuraceous rachis, shorter spadix, narrower and shorter apical leaf segment, and less number of primary nerves.

Bactris venezuelensis Steyermark, sp. nov.

Caudex 3 m. altus, supra 1.5 cm. crassus; frondis vagina fusco-tomentosa furfuracea, aculeis brevibus tenuibus nigris instructa; petiolo 20-27 cm. longo infra pallido-tomentoso-furfuraceo, aculeis nigris supra longioribus 3-4 cm. longis, infra brevioribus numerosis 0.6-2.2 cm. longis armato; rhachi 28 cm. longa, 4-5 mm. crassa,

pallido-fusca furfuracea mox glabrescenti, prope basim aculeis nigris 2-3.5 cm. longis armata; lamina 55-75 cm. longa, 30 cm. lata, apice profunde bifida, paucisecta, segmentis utroque latere infra 2-4 irregulariter et inaequaliter dispositis lanceolatis sigmoideis supra glabris subtus pilis pallidis dissitis minute adpressis et ad nervos inconspicue furfuraceis, ad margines setis brevibus tenuibus nigris 1.5-2 mm. longis; segmenta terminali magna cuneato-oblanceolato-obovata, parte indivisa 13-16 cm. longa, 12-18.5 cm. lata, lobis oblongo-lanceolatis, 20-35 cm. longis, 7-10 cm. latis, nervis primariis utroque latere 8-9; segmentis lateralibus altermatis aut suboppositis, 30-50 cm. longis, 1.5-4.5 cm. latis, nervis primariis utroque latere 2-3, nervis secundariis 7-10; spatha exteriore 5 cm. longa, interiore fusiformi 11-12 cm. longa, setis fuscis pilosis vel glabrescentibus 5-6 mm. longis vel brevioribus dense obtecta, fusco-tomentosa; spadice patenti demum pendenti, ramulis 8 gracilibus, 7.5-9.5 cm. longis, 1-1.5 mm. latis, crassis conspicue scrobiculatis paullo tomentosis; rhachi 1 cm. longa dense fusco-tomentosa, pedunculo 4-4.5 cm. longo, 4 mm. crasso, inermi dense pallido-fusco-tomentosa furfuracea; floribus masculinis ignotis; floribus foemineis: calyce urceolata, 3-3.5 mm. longa, 2.5-3 mm. lata, 3-denticulata glabra pluristriata; corolla quam calyce longiore tubulosa 5-5.5 mm. longa, apice subtruncata ciliato-setulosa, pluristriata, superficie setulosa setis brevibus paucis nigris, mox deciduis.

Petiole spiny, the spines above longer and more scattered, shorter and more numerous in lower part; sheathing base of petiole shredding at sides; lamina deeply bifurcate at apex into a large terminal segment with 2-4 pairs of lanceolate sigmoid segments irregularly and unequally distant below, glabrous above, minutely appressed-pubescent below with scattered pale hairs and furfuraceous on the lower surface of some of nerves; lateral segments tapering to an elongate apex, often remotely separated from the terminal bifurcate segment; axis of spadix not continued throughout its length, branches conspicuously scrobiculate from the insertions of the flowers; pistillate calyx slightly 3-denticulate with shallow lobes.

Type in herb. Chi. Nat. Hist. Mus., collected in forest along Base River (Caño Negro), at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 225 m., August 23, 1944, *Julian A. Steyermark 57933.*

This species is closely related to *B. corosilla* Karst., *B. geonomoides* Drude, *B. incommoda* Trail, and *B. penicillata* Barb. From the last one it differs in the shorter spathe and spadix, shorter lamina, and black instead of brown petiolar spines. From *B. geonomoides* and *B. incommoda* it differs in the broadly lanceolate-falcate instead of linear lowermost pair of pinnae, in shorter brown instead of longer black spines covering the outer surface of the spathe, and in the somewhat shorter spathe.

Dahlgrenia Steyermark, gen. nov.

Monoeca, spadicibus distinctis unisexualibus. Spadis utriusque sexus ramosus, ramis masculinis tenuibus. Flores masculi minutuli: calyx parvus, sepalis 3 imbricatis late subrhomboideo-subglobosis; corolla petalis 3 valvatis liberis non patentibus basi non-dilatatis nec gibbosis oblongis; staminibus 6. Flores foeminei parvi: calyx sepalis 3 imbricatis suborbicularibus; corolla petalis 3 valvatis late ovatis; staminodia 6 ad basim ovarii adhaerentibus; ovario integro glabro, loculis 3, ovulo in loculo solitario, stigmatibus apicalibus.

Palmae inermes, frondibus paripinnatis. Pinnae apice praemorsae et erosae.

Type species: **Dahlgrenia ptariana** Steyermark.

This genus is dedicated to and named in honor of Dr. B. E. Dahlgren, Curator Emeritus of the Department of Botany at the Chicago Natural History Museum. Students of palms owe Dr. Dahlgren a debt of gratitude for his contributions to the study of tropical American palms, for the excellent series of palm exhibits and palm herbarium which he has organized and developed at the Museum, and especially for his monumental work "Index of American Palms" published in 1936.

Dahlgrenia ptariana Steyermark, sp. nov.

Caudex 11-14 m. altus, 9.5-10 cm. crassus, solitarius; frondibus 2.2 m. longis 4-seriatis subcoriaceis supra viridibus infra argillaceis lineis latis fuscis ad margines exteriores et squamis fuscis sessilibus microscopicis obtectis; rhachi usque ad 4.5 cm. lata tomentosa cinereo-fusca praedita supra carinata infra convexa; pinnis utroque latere 28 valide sulcatis, pinna terminali cuneata praemorsa 50 cm. longa, ceteris angustate ligulatis apice oblique praemorsis et erosis, 86-115 cm. longis, 7 cm. latis, infra usque ad 16 nervis, lineo lato marginali 4-8 mm. lato; spathis elongatis; spadice masculina alba ramis numerosis tenuibus 9-12 cm. longis, 2 mm. crassis, glabris; floribus masculinis confertis glabris; sepalis supra rotundatis 0.5 mm. altis, 0.7-0.8 mm. latis, petalis ovatis vel elliptico-oblongis, 0.7 mm. longis, 0.5 mm. latis, obtusis; antheris sessilibus vel fere 0.5-0.6 mm. longis; spadice foeminea alba tomentella pilis brevibus albidis, rhachi 60 cm. longa, 1-2.5 cm. crassa, ramis numerosis 60 cm. longis, 2 mm. crassis; bracteis late ovatis acutis vel acuminatis, 2.5-3 cm. longis, basi 2 cm. latis, extus fulvo-tomentosis, intus basi nigris; sepalis rotundatis 1.5 mm. altis, 2.5 mm. latis ad margines ciliatis; petalis obtusis 2 mm. latis, 2 mm. altis, striatis; staminodiis 0.2 mm. longis dentiformibus; ovario 1.2 mm. longo.

Fronds 4-ranked; rachis covered with a fine dull gray-brown tomentum which wears off in age, but persists in places as a dark brown tomentum; pinnae subcoriaceous, deep rich green above, silvery below with a broad, dark brown, tomentose band extending along outer margin on lower surface of each segment, sometimes

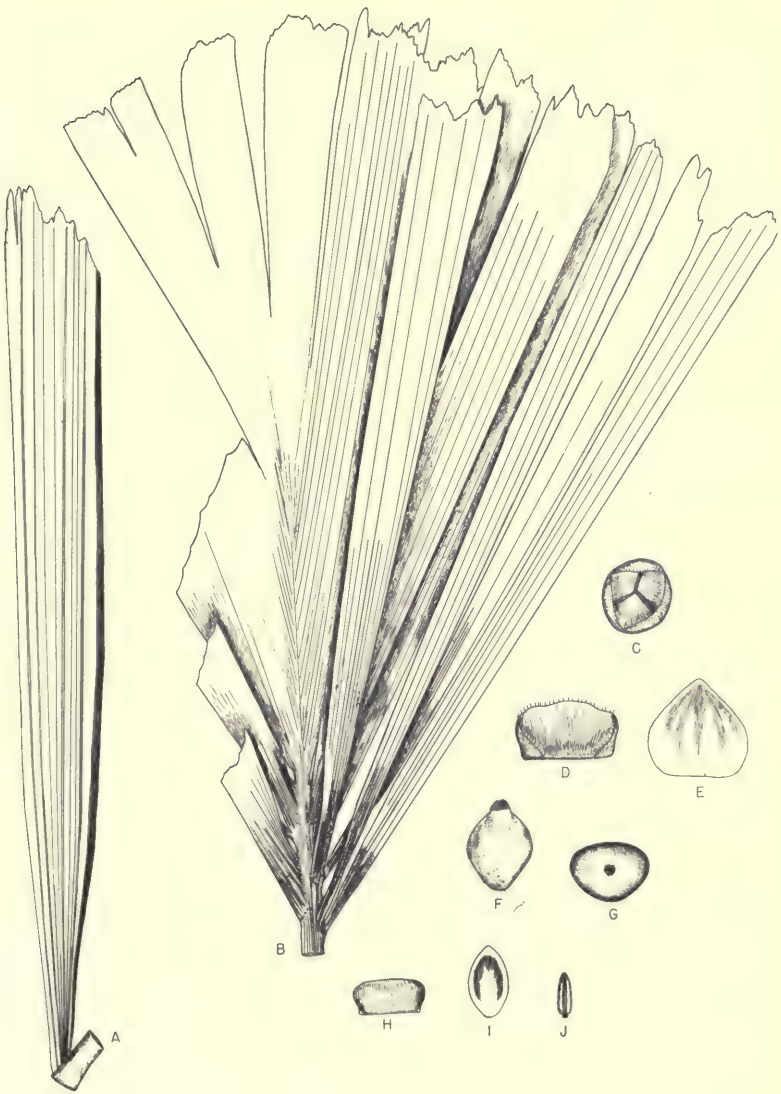

FIGURE 11

Dahlgrenia ptariana **Steyermark**

A, Leaf segment from lower portion of frond (X 1/7); B, Terminal portion of frond (X 1/5); C, Pistillate flower, from above (X 5.5); D, Pistillate sepal (X 5.5); E, Pistillate petal (X 6); F, Pistil (X 10); G, Pistil, from above (X 10); H, Staminate sepal (X 9); I, Staminate petal (X 5); J, Stamen (X 10).

other narrower, dark brown bands occur elsewhere on the segment, the lower surface covered with numerous, microscopic, sessile, deep brown scales, strongly sulcate above and conspicuously ribbed below; terminal segment cuneate, shallowly and irregularly erose at apex, 50 cm. long; middle and lower pinnae narrowly ligulate, obliquely praemorse and shallowly erose along apex, up to 16- nerved on lower surface, but often with only 3-5 strong nerves, the dark brown, tomentose, marginal band 4-8 mm. wide; spadices unisexual, arising on trunk at base of leafy shoot, white; staminate spadix with numerous branches, the branches slender with crowded staminate flowers; staminate sepals broadly depressed-rounded; staminate petals separate and free to the base, the margins pale; pistillate spadix covered minutely with short whitish tomentum; pistillate sepals depressed-suborbicular; staminodia attached at base of ovary (Fig. 11).

Type in herb. Chi. Nat. Hist. Mus., collected on southeast-facing slopes of Ptari-tepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 60044.*

Local name: "Puru-a-yek". This is one of the dominants of the understory of the moist forest covering the southeast-facing slopes of Ptari-tepuí. The inside of the shoot is not edible.

The characteristics of this new genus are the occurrence of the pistillate and staminate flowers in separate spadices, the pistillate flowers much smaller than in *Socratea, Iriartea, Dictyocaryum, Catostigma,* or *Catoblastus,* the entire glabrous ovary with apical stigmas, the very small staminate flowers with separate petals not spreading and not dilated or gibbous at base, and the 6 stamens.

In Dugand's key to the Iriarteae (Caldasia 1: 33-34. 1940), this plant does not fall into either section. He has "Flores de ambos sexos en el mismo espádice; ovario entero, de estigmas apicules o excéntricos", which includes *Socratea, Iriartea, Iriartella, Dictyocaryum,* and *Cuatrecasea,* as opposed to "Flores de cada sexo en espadices, separados", which includes *Catoblastus, Catostigma, Wettiniicarpus,* and *Wettinia.* Our collection would fall in the latter group. However, that group has the "ovario casi siempre trilobulado (1 ó 2 lobulos mas pequeños abortivos) a menudo pubescente o velludo, con estilo o estigmas basilares o sobre los lóbulos basales; palmeras medianas o elevadas", whereas our collection has "ovario entero, de estigmas apicales o excéntricos" which would place it with *Socratea, Iriartea,* and *Dictyocaryum.*

Like *Dictyocaryum* our collection has 6 stamens, entire ovary with apical stigmas, 6 staminodia, and the segments of the leaves quite laciniate in different directions; however, unlike that genus, the staminate and pistillate flowers are in separate spadices, the pistillate flowers are much smaller, and the staminate sepals are not dilated or gibbous at the base, and are much broader than long. In

Dictyocaryum the staminate sepals are narrower and much longer than broad.

It will be observed that the segments of the fronds in *Dahlgrenia* are narrow, because they have become split at maturity apparently into five narrow divisions, whereas actually it may represent just one leaf segment up to 21 cm. wide that has become split into portions from 3-5 cm. wide. On such a wide leaf the brown bands may number as many as nine, but when each segment splits lengthwise of the whole of which it is a part, these brown bands then appear marginal, with the result that there may be up to twenty-five main nerves extending lengthwise, these becoming fewer in number as the segment becomes split.

Desmoncus duidensis Steyermark, sp. nov.

Scandens vel subscandens; frondis vagina inermi fusco-furfuracea; fronde 0.78 m. longa; flagello tenui 20 cm. longo, foliolis hamatis 4-jugis rectis 12-25 mm. longis, 1-1.5 mm. latis, aculeis brevibus retrorsis curvatis 1.5 mm. longis fusco-furfuraceis; rhachi tenui 2-3 mm. crassa fusco-furfuracea aculeis retrorsis brevibus viridibus vel stramineis praedita; pinnis oppositis 4-jugis sessilibus oblongo-ellipticis ad apicem acuminatis ad basim nonnihil angustatis 12.5-16 cm. longis, 3.5-6 cm. latis, supra glabris, infra minute fusco-maculatis vel punctatis, ad margines fusco-furfuraceis 2 mm., firme membranaceis.

Low climbing or sprawling plant; frond dark green above, dull paler green below.

Type in herb. Chi. Nat. Hist. Mus., collected in forest along Base River (Cãno Negro), at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 225 m., August 23, 1944, *Julian A. Steyermark 57944.*

Desmoncus duidensis is distinguished by the few pairs of oblong-elliptic sessile opposite pinnae, the slender, short, few pairs of straight barbs of the cirrhus, the unarmed leaf sheaths and leaflets, the minutely aculeate rachis, and the brown-furfuraceous margins. From *D. nemorosus* Barb. it differs in the unarmed leaf sheath, shorter more slender barbs of the cirrhus, and the fewer leaflets, which are not aculeate on the lower surface of the midrib. From *D. aereus* Drude it may be distinguished by the shorter, more slender, fewer barbs of the cirrhus, and by the short-aculeate rachis.

Desmoncus multijugus Steyermark, sp. nov.

Scandens; frondis vagina pallido-viridi, tomento flavo-cinereo, setis fuscis confertis 2-15 mm. longis; fronde 1.7 m. longa brevi-petiolata; petiolo 1 cm. longo; flagello 50 cm. longo, foliolis hamatis 6-jugis oppositis rectis robustis, 1.3-5 cm. longis, 3-4 mm. latis, rhachi inermi; infra foliola hamata 2 foliolis aliis longioribus retrorso-patentibus 7.5-10 cm. longis; frondis rhachi utrinque fusco-

furfuracea, parte inferiore pubescente, aculeis fuscis 11-40 mm. longis abundanter instructa; pinnis plerumque alternatis vel subopositis, utrinque 23-25, sessilibus anguste lanceolatis ad apicem acuminatis, ad basim angustatis, 20-30 cm. longis, 2-3 cm. latis, glabris praeter utrinque lineas fusco-furfuraceas aut tomentosas per nervos, supra omnino glabrescentibus, utrinque in costa media aculeis 2-6 fuscis, 13-32 mm. longis armatis, aculeis praesertim basi et parte inferiore saepe pubescentibus; spatha superiore aut interiore elliptica, 30 cm. longa, 8-10.5 cm. lata, tomentosa fusca, aculeis brevibus tenuibus nigro-fuscis basi straminea bulbosocrassiuscula oriundus; spadice simpliciter ramoso 15 cm. longo fusco vel purpureo-fusco-furfuraceo; spadicis ramis 37 angulatis undulatis 10-15 cm. longis, 2 mm. crassis, prope basim atro-fusco-furfuraceis aliter glabris; floribus foemineis: calyce cupulare gamosepala 0.5 mm. alta margine 3-apiculata; corolla gamopetala pluristriata 3-lobata, 1.5 mm. alta, lobis suborbicularibus, late rotundatis, per margines obscuros, 1.5 mm. alta, 2 mm. lata; spadicis pedunculo compresso, parte superiore 5 cm. longa, 1 cm. crassa, purpureo-fusco-furfuracea aculeis brevibus nigris 3-5 mm. longis praedita, parte inferiore 11 cm. longa, inermi; drupa novella ovoideo-oblonga superne subito angustata, 8.5-9 mm. longa, 5 mm. crassa.

Pinnae closely but unequally distributed along the rachis, membranaceous, grass dull green above, dull paler green below, narrowly lanceolate, tapering to an acuminate apex, gradually narrowed to base, armed on midnerve and lower and upper leaf surfaces with 2-6 dark brown spines 13-32 mm. long, the spines often pubescent, especially at base and lower half, the leaf surface glabrous except for brown-furfuraceous or tomentose lines along one or more nerves above and below, becoming entirely glabrescent above; rachis fuscous-furfuraceous throughout; upper spathe moderately armed with short slender black-brown spines 6-11 mm. long, arising from a bulbous-thickened buff-colored base; drupe becoming scarlet.

Type in herb. Chi. Nat. Hist. Mus., collected in vicinity of Tumeremo, between south of town and airport, state of Bolívar, alt. 305 m., December 18, 1944, *Julian A. Steyermark 60968.*

Known locally as "Camuari". The stems are stripped of their spines and split into lengths which are woven into various types of baskets (*canaste*) and back carriers (*guayare*).

This species is characterized by its numerous closely and unequally spaced pinnae, elongate black spines of the brown-furfuraceous leaf rachis, the spiny leaves, and the spiny broadly ovate inner spathe. It is most closely related to *D. rudentum* Mart., *D. horridus* Splitgerb., *D. palustris* Trail, and *D. angustisectus* Burret, to which group it belongs by reason of the broad ovate inner spathe, and, following Burret's establishment of the section *Orthacanthium*, by the straight instead of recurved pairs of hooks, but from all these

it is distinguished by the greater number of pinnae, combined with the other characters stated above.

Euterpe ptariana Steyermark, sp. nov.

Caudex 8-9.5 m. altus, 5-7.5 cm. crassus; frondibus magnis 2.2 m. longis, in parte media 1.4 m. latis, pinnis utrinsecus 32, petiolo 30-32 cm. longo, 2-2.5 cm. lato, supra concavo, subtus convexo utrinque atro-leproso, ad vaginam dilatato; frondis vagina elongata coriacea glauca cano-viridi maculis purpureo-fuscis, rhachi triangulari, 2.5-20 mm. crassa, subtus squamis nigris aut purpureo-fuscis persistentibus obtecta, lateribus squamis paucioribus; pinnis subcoriaceis subobpositis vel alternatis ligulato-lanceolatis acuminatis vel filiformi-caudatis, usque ad 80 cm. longis et 5 cm. latis, 2 infimis angustissimis 0.4-0.8 cm. latis, plerumque 5-nervatis, subtus costa media et nervis primariis squamis elongatis persistentibus purpureo-fuscis obtectis, inter nervos maculis fuscis parvissimis; spatha coriacea squamis purpureo- vel nigro-fuscis partim vel omnino obtecta, mox glabrescenti; spadice immatura 15 cm. longa, pedunculo brevissimo 2-3 cm. longo, ramis circ. 30, 20-25 cm. longis, 1.5-2 mm. crassis, minute puberulis pilis pallidis vel stramineis, bracteis 3.5-4 mm. longis ovatis acuminatis; floribus immaturis.

Pinnae subcoriaceous, deep green above, dull green below, upper surface (in dried state) covered with a "bloom", middle pinnae falcate with a long acuminate or filiform-caudate tip, 58-61 cm. long, 4.5-5 cm. wide, the caudate part up to 5.5 cm. long, the upper pinnae short, abruptly acuminate, the uppermost ones 20-37 cm. long, 2.5-3.5 cm. wide, the 2 lowermost pinnae much narrower than the others, 63-80 cm. long, 0.4-0.8 cm. wide, the pinnae mostly 5-nerved (including the midnerve and 2 strong nerves on each side), the principal nerves and especially the midrib on lower surface covered with elongated purplish-brown persistent scales attenuate at each end and darker black-brown in the center, minutely dotted with dull brown spots on the leaf surface between the nerves.

Type in herb. Chi. Nat. Hist. Mus., collected in forest near "Misia Kathy" camp, southeast-facing slopes of Ptari-tepui, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 60045.*

Local name: "Manaca-si-yek". The interior of the shoot of this palm is edible. It is a common species of the forest at the elevation noted.

This species is characterized by the purplish-brown or blackish scales attached to the nerves of the lower leaf surface, the blackish-brown scurfiness on the lower part and sides of the leaf rachis, the glaucous gray-green leaf sheath with purple-brown specks, the minutely puberulous branches of the rachis of the inflorescence with pale buff pubescence, and the very narrow lowermost leaf segments.

It differs from *E. roraimae* Dammer, which also possesses peculiar, large, colored scales, in that the scales of the lower leaf surface of *E. roraimae* are rich brown, whereas those of *E. ptariana* are much darker brown, being purple- or blackish-brown and darker in the center. Furthermore, in *E. ptariana* there is an abundance of persistent dark purplish-brown or blackish scales on the lower side of the leaf rachis, whereas in *E. roraimae* these are either absent, relatively sparse, or deciduous in mature leaves. Moreover, the branches of the spadix in *E. roraimae* are fuscous-brown tomentose, whereas in *E. ptariana* they are minutely puberulous with buff or light-colored hairs. Another characteristic of *E. ptariana* is the glaucous gray-green leaf sheath speckled purple-brown. In addition, the peduncle of the spadix in *E. ptariana* appears, by comparison with the rachis, to be much shorter and the branches more slender than in *E. roraimae*. Finally, the lowermost pinnae are much narrower in *E. ptariana* than in *E. roraimae*.

Geonoma karuaiana Steyermark, sp. nov.

Caudex 1.75-2.75 m. altus; frondibus usque ad 7.5 dm. longis pinnatisectis; pinnis utroque latere 4; petiolo 30-33 cm. longo plus minusve partim fusco-leproso, mox partim glabrescenti; pinnis firme membranaceis, 35-50 cm. longis, 4-12 cm. latis, apice falcato-acuminato filiformi, nervis primariis 4-11, subtus ad nervos squamis fuscis persistentibus seriatis dispositis; spatha 10-11 cm. longa, 1.5-2.5 cm. lata, extus fusco-leprosa; spadice 11-20 cm. longo, 10-20 cm. crasso; pedunculo tenuiter granuloso-tuberculato squamis fuscis; spadicis ramis 7-11, simplicibus 7 vel 2 infimis furcatis ad apicem spinosis, 9-15 cm. longis, 3 mm. crassis, dense vel breviter pilosis, tenuiter granuloso-tuberculatis; floribus in foveis spiraliter dispositis, 40 e basi ad apicem 2-4 mm. dissitis non bilabiatis, labio inferio truncato fere recto, labio superio curvato-rotundato; floribus masculinis: sepalis elliptico-oblongis obtusis, 2.5 mm. longis, 1.75 mm. latis ad margines denticulatis; petalis 2.5 mm. longis, 1.75 mm. latis, oblanceolato-oblongis obtusis usque ad 2/3 longitudinem connatis; urceolo staminali 0.5 mm. longo; filamentis 0.5 mm. longis; antheris 1.25-1.5 mm. longis; floribus foemineis sub anthesi: sepalis 2-2.5 mm. longis oblongo-lanceolatis; fructu elliptico-ovato 7 mm. longo, 6 mm. crasso, nigro (sicco) striatulato (sicco).

Frond dark green above, dull green below; petiole with patches of brown scurfiness, becoming glabrescent in places; pinnae widely separated, 7.5 cm. separating the first pair from the second, 7.5-8.5 cm. separating the second pair from the third, and 6-7.5 cm. separating the third pair from the fourth pair, the lower 3 pairs of pinnae 35-45 cm. long, 4-4.5 cm. wide, 7-11-nerved, narrowly lanceolate, falcate-acuminate, the apex prolonged into a long filiform tip 3-4.5 cm. long; uppermost pairs of pinnae 45-50 cm. long, 11-12 cm. wide, broadly lanceolate, with 4 primary nerves, the falcate-acuminate

apex prolonged into a slender filiform tip about 3-4 cm. long, asymmetric at base, the lower surface of the main nerves with lines of persistent brown scales, which also tend to persist in patches along the leaf rachis, on the lower surface, and on the sides; spadix 11 cm. long in anthesis, 15-20 cm. in fruit, 5-20 cm. in diameter, the peduncle finely granulose-tuberculate with dark brown scales interspersed along the axis, the branches of the spadix 7-11, the simple ones 7, the two lowest sometimes forked, spinose at apex, 9-15 cm. long, densely or sparsely short-pubescent, finely granulose-tuberculate, the hairs darkening in age; flowers with foveolae 3-4 mm. apart on the same side, but only 2 mm. apart between those nearest each other; fruit small, blackish when dried, deep olive green in life.

Type in herb. Chi. Nat. Hist. Mus., collected along Río Karuai, at base of Sororopán-tepuí, west of La Laja, state of Bolívar, alt. 1220 m., November 29, 1944, *Julian A. Steyermark 60789.*

This species is characterized by having few (4) pairs of broad leaf segments which on the nerves of the lower leaf surface and along the lower surface of the leaf rachis have lines of brown scurfiness, relatively small fruits, minutely pilose rachillae of the flowering branches, spinose tips of the branches, and relatively small spathes.

Hyospathe maculata Steyermark, sp. nov.

Caudex solitarius, 1.3 m. altus, 8 mm. crassus; lamina 55-65 cm. longa, 4-6-juga fere concolori firme membranacea; petiolo 12.5 cm. longo, 4 mm. crasso; rhachi 19-28 cm. longa utrinque irregulariter fusco-maculata; segmentis falcatis inaequalibus, late lanceolatis anguste acuminatis, 35-43 longis, jugis infimis 1.5-3 cm. latis, mediis 3.5-4.5 cm. latis, supremis 4.5-6 cm. latis, infra glabratis, nervis pluribus; segmentis intermediis angustioribus linearibus vel lineari-lanceolatis, 35-38 cm. longis, 1-1.5 cm. latis, anguste acuminatis, apicibus filiformibus; vagina fusco-maculata leprosa; spadice parvo; spatha non visa; pedunculo 3.9-4 cm. longo, 3 mm. lato; inflorescentiae rhachi pallido-viridi, parte florifera 9 cm. longa, 18 cm. lata, ramis 12, simplicibus, 5.5-10 cm. longis, 1.5-2 mm. crassis; floribus masculinis sessilibus: calyce 1.25 mm. longo, 1 mm. lato, lobis 4 parce inaequalibus late triangularibus, 0.3-0.4 mm. longis, apice 0.2 mm. latis; petalis 4, 2.8-3 mm. longis, 0.9-1 mm. latis, oblongis vel lanceolato-oblongis, obtusis, tenuiter pluristriatis; staminibus 4-7; antheris 0.8-0.9 mm. longis; filamentis 1 mm. longis; fructu non viso.

Rachis of frond irregularly dotted or splotched on all sides, especially prominent on lower side, with dark brown scales or masses of scales; segments of frond glabrate on the lower surface or somewhat brown-scaly near base, deep green above, dull green below; leaf sheath dark brown, mottled with tiny patches of persistent scales, less densely so on older spathes; flowering rachis arising on trunk just below leafy shoot, divergent; flowers dull yellow.

Type in herb. Chi. Nat. Hist. Mus., collected on wooded slopes of Quebrada O-paru-má, between Santa Teresita de Kavanayén and Río Pacairao (tributary of Río Mouak), state of Bolívar, alt. 1065-1220 m., Nov. 20-21, 1944, *Julian A. Steyermark 60406.*

Known locally as "Kricha-yu-yek". The fruit is said to be edible, and has an acidulous watery quality.

This species is characterized by the small spadix and spadix branches, the 4-6 pairs of leaf segments, and by the maculate leaf sheath and base of the leaf stipe. It is most closely related to *H. Ulei* Dammer of Peru, from which it differs in the sessile staminate flowers with 4 instead of 3 petals, 4 instead of 3 calyx lobes, and shorter anthers.

Mauritia flexuosa L., var. **venezuelana** Steyermark, var. nov.

A typo differt fructu minore, squamis fructiferis minoribus, et lobis calycis fructifera minoribus.

Outer pistillate lobes suborbicular, 6-7 mm. long, 7-8 mm. wide, the inner ones ovate, acute, 8 mm. long, 6.5 mm. wide; fruit 3.5-4 cm. broad; scales of the fruit relatively small, 3.5 mm. long, 4-4.25 mm. wide.

Local name: "Moriche".

Type in herb. Chi. Nat. Hist. Mus., collected along a small stream with running water in morichales in savanna between Río Caroní and Ciudad Bolívar, state of Bolívar, alt. 200 m., August 2, 1944, *Julian A. Steyermark 57649.*

According to Pittier et al, the common species of *Mauritia* in the morichales of the llano in Venezuela is *M. minor* Burret (Catalogo de la Flora Venezolana, vol. 1: 143, 1945), and *M. flexuosa* is not even credited to the country. But, Pittier was following the results of Dugand's studies when he adopted the name *M. minor*, since Dugand showed what was passing in Colombia as *M. flexuosa* was really *M. minor*, the material common to the eastern llanos in Colombia having elliptical rather than globose fruit. According to his communication from Pittier, it is stated (Dugand, A. Caldasia 3: 18. 1941) that "El Profesor H. Pittier, a quien comuniqué recientemente mis dudas respecto a la identidad del moriche del Meta, me ha escrito confirmando mis punto de vista y diciéndome que los ejemplares del moriche venezolano que él posee tampoco pertecen a *M. flexuosa* puesto que sus frutos son elípticos y no globosos."

However, this statement by Pittier is not borne out by the present collection (*Steyermark 57649*), which comes from the llanos around Ciudad Bolívar, and which has globose mature fruits. Those collected by Williams (his no. *14802*) from the Upper Río Negro (cited as *M. Carana* Wallace) are described by Williams as "globose". Apparently, Pittier's observations communicated to Dugand are either

inexact or too general. Thus far, all the material examined by me from the Venezuelan llanos has globose fruit.

The size of the scales of the fruit, the fruit itself, and the length of the calyx lobes in *Steyermark 57649* are all smaller than stated in the description of *M. flexuosa* given by Drude in Mart. Fl. Bras. (pp. 290-291), but agree with that species better than for any other. In the absence of typical material of *M. flexuosa* from Surinam, and from the lack of identifying criteria in Linnaeus's description, this Venezuelan collection is probably best treated as a small-fruited variety of that species, having the same type of globular fruit as is characteristic of *M. flexuosa*. From *M. Minor* if differs in its smaller globose rather than elliptic fruit, smaller fruiting scales, and smaller calyx lobes, while from *M. Carana* it differs principally, if Wallace's description is to be followed literally, in the shape of the fruits, described in *M. Carana* as "slightly ovate".

Dugand (Caldasia **3**: 18. 1941) further states that "las informaciones del Profesor Pittier son suficientemente significativas y deben aceptarse como terminantes en el sentido de que el moriche venezolano no corresponde a la descripcion de *M. flexuosa*." Since I have shown above that the globose fruits of my *57649* do correspond, it is proper to refer them to *M. flexuosa* as agreeing with the description for globose fruits.

Socratea albolineata Steyermark, sp. nov.

Caudex solitarius, gracilis, 9-12 m. altus, 7.5-12.5 cm. crassus; frondibus 2.7 cm. longis, segmentis utrinque 18; rhachi dense pallida flavido-tomentosa, prope basim 3 cm. crassa; frondibus apice furcatis paripinnatis, segmentis cuneatis transversim praemorsis; segmentis majoribus cuneatis, apice oblique maximis 70-90 cm. longis, 10-17 cm. latis, circ. 15-nervatis, infra 10-13 lineis tomentosis albidis aliter glabris; spadice fructifero 50 cm. longo, basi 5-10 cm. lato, parte media 2-3 cm. lata, supra 0.5-1 cm. lato et glabriusculo vel tenuiter parce adpresso-piloso, infra tenuiter strigoso; ramis fructiferis patento-curvatis, 15-35 cm. longis, 5-6 mm. crassis, ad basim fulvo-tomentosis; vaginis fructiferis indumento tenui cinereo vestitis, praesertim infimis pilis fuscis brevibus adpressis; perianthio fructifero glabro; sepalis fructiferis late triangularibus, supra rotundatis, 4 mm. longis, 7 mm. latis; petalis fructiferis late depresso-suborbicularibus, 3-5 mm. longis, 11 mm. latis; bacca oblonga calva glabra pallido-fusca, 2.5 cm. longa, 2 cm. crassa; pericarpio 1 mm. crasso; semine oblongo, 17-18 mm. longo, 13 mm. lato; embryone apicali vel subapicali; mesocarpio albido furfuraceo, lineis irregularibus castaneis radiato; endocarpio extus fusco lineis irregularibus pallido-vel flavido-fuscis anastomosantibus ramificatis.

Frond forked and praemorse at apex with shallow irregular teeth; larger segments cuneate, obliquely praemorse at apex with irregular coarse teeth, the margin extended into 6-8 laciniate portions slender-

ly elongated, the lower surface glabrous except for 10-13 dull white, tomentose, longitudinal bands, deep green on upper surface, dull green on lower surface; fruiting spadix arising at base of (below) leaf sheath, 5-10 cm. wide at base, 2-3 cm. wide in middle portion, 0.5-1 cm. wide in the upper half, glabrescent or finely sparsely appressed-pilose above or finely strigose below; fruiting sheaths covered with a dull gray, fine coating, which is covered over, especially on the lowermost sheath, with brown appressed short hairs; mesocarp whitish, dry-scaly, with irregular, castaneous, thread-like parts running lengthwise through tissue; outside of endocarp dark brown with irregular buff or pale brown longitudinal lines anastomosing or branching on surface.

Type in herb. Chi. Nat. Hist. Mus., collected in lower portion of Quebrada O-paru-má, tributary of Río Pacairao, below Santa Teresita de Kavanayén, state of Bolívar, alt. 915-1065 m., November 25, 1944, *Julian A. Steyermark 60541.*

Known locally as "Capai-chan-yek" ("Cola de Pescado"). The bark and wood are used locally by the inhabitants for making into roofs.

This species is distinguished by the longitudinal lines of white tomentum on the lower surface of the leaf segments, which are otherwise glabrous, by the concolorous leaf surfaces, and by the dense tomentum over the surface of the leaf rachis, especially in its lower portion. From *S. elegans* Karst., described as having the lower side of the leaf segments with "lineis albo-tomentosulis notatas", this new species differs in the concolorous rather than glaucous lower leaf surface, and in the segments with longer, more erose tips.

ARACEAE

Anthurium duidae Steyermark, sp. nov.

Planta terrestris glabra; caudice paullo elongato, 5 mm. crasso, internodiis 1.5-3 cm. longis; cataphyllis ovatis vel lanceolatis, obtusis, nervatis, 1.5-5 cm. longis, 1-1.3 cm. latis; petiolis lamina longioribus, 19-28 cm. longis, 2.5-3 mm. crassis; lamina in sicco subcoriacea, late ovato-oblonga, 13-16 cm. longa, 8-11 cm. lata, supra obscure viridi, subtus pallida, apice rotundata, basi subcordata, nervis primariis utrinque 1, basi nascentibus, 1-1.3 cm. a margine remotis, utrinque distincte prominentibus.

Blades deep green above, pale below.

Type in herb. Chi. Nat. Hist. Mus., collected on summit of Cerro Duida, along valley forest between Central Camp and Brocchinia Hills, Territorio Federal Amazonas, alt. 1675 m., August 31, 1944, *Julian A. Steyermark 58099.*

In leaf shape this species somewhat resembles *A. marense* Krause, but that species has the primary nerves more remote from the margin

and a more deeply cordate or subcordate leaf. From *A. glanduligerum* Engl. it differs in having 3 instead of 5 prominent nerves (1 instead of 2 main primary nerves on each side of the midnerve), the lowest pair evident in *A. glanduligerum*, but not in *A. duidae*. It is unfortunate that the material upon which this new species is based is sterile, but it resembles no other described species.

Anthurium Krauseanum Steyermark, sp. nov.

Herba epiphytica, caudice elongato, 5-10 mm. crasso, internodiis 2-2.5 cm. longis, caulibus radices paucas elongatas emittentibus; cataphyllis ovato-oblongis, obtusis, 2-2.5 cm. longis; foliorum petiolis 21-23 cm. longis, 3 mm. crassis, supra sulcatis teretiusculis; lamina coriacea, supra atro-viridi nitente, ovato-oblonga, basi subtruncata vel rotundata, apice obtusa, 17-19 cm. longa, 7-8.5 cm. lata, nervis primariis utrinque 2 basi nascentibus, infimis leviter arcuatis in ima quarta parte marginibus exeuntibus, intimis validioribus adscendentibus medium a margine 1.3-1.5 cm. remotis, utrinque distincte prominentibus; spatha 2.3 cm. longa, 5 mm. lata; spadice stipite 4 mm. longo suffulto, 10 mm. longo, 4 mm. crasso.

Leaves dark green and shining above, dull paler green below; spadix dull lavender.

Type in herb. Chi. Nat. Hist. Mus., collected in woods on southeastern portion of base of Carrao-tepuí, state of Bolívar, alt. 1460-1615 m., December 4-5, 1944, *Julian A. Steyermark 60847.*

This species is related to *A. crassifolium* N. E. Brown, differing from that in its smaller spathe and spadix, stipitate instead of sessile spadix, and subtruncate to broad, instead of cuneate, leaf base. In its shorter stipe and spadix, and narrower spathe, it differs from *A. microphyllum* (Hook.) Don.

Anthurium monsterioides Steyermark, sp. nov.

Caudex epiphyticus; foliorum petiolo 45 cm. longo, 1-2 cm. crasso, semitereti; lamina 9-11-secta, segmentis subpetiolatis, basi longe cuneatis liberis, apice abrupte acuminatis, 35-60 cm. longis, 10-25 cm. latis, nervis primariis 3-4 utrinque; lobis 4 utrinque vel pauciioribus remotis, apice abrupte acuminatis et sursum curvatis, 8-12 cm. longis, 5.5-8.5 cm. latis; pedunculo quam petiolo breviore, 25 cm. longo, 8 mm. crasso; spatha subcoriacea, viridi, 10-24 cm. longa, 1.5-3 cm. lata, lanceolata, acuminata reflexa; spadice sessili pallido-purpurascente, 8-23 cm. longo, inferne 0.7-1.3 cm. crasso; tepalis 2 mm. longis, 1-1.3 mm. latis; pistillo 2-2.3 mm. longo; ovario oblongo-ovoideo; stigmate sessile coronato.

Leaf blade dark green above, dull green below, the 9-11 segments cuneately tapering and decurrent to the substipitate base, the stipitate portion up to 1.5 cm. long, midnerve prominent especially below; inflorescence arising from base of leaf sheath.

Type in herb. Chi. Nat. Hist. Mus., collected on rich forested slopes along Río Onia, near Bolero, north of Mesa Bolívar, state of Mérida, alt. 545-915 m., May 23, 1944, *Julian A. Steyermark 56727.*

Apparently a member of sect. *Semaeophyllium* Schott, this species is related to *A. Holtonianum* Schott, *A. Burchellianum* (Engl.) Macbr., and *A. clavigerum* Poepp. & Endl. in its deeply lobed, laciniate leaves, but differs from all of them in the acuminate lobes of the segments, each segment deeply cut in the manner of *Monstera dilacerata.* The lobing most closely approaches that of *A. clavigerum,* but that species has most of the lobes rounded at the apex, and the spaces between the lobes are larger. To add to the resemblance between this species and *Monstera dilacerata,* it will be noted that some of the leaflets of the segments have large holes, which appear as natural as those in the *Monstera,* although in the single specimen at hand, it is not possible to state definitely whether some of the holes may not have been caused by insect damage. None of the other lobate-laciniate species of *Anthurium* have long acuminate, upwardly curved tips to the lobes of the segments, nor have as deeply cut lobes as has this species.

Anthurium ptarianum Steyermark, sp. nov.

Planta terrestris, caudice erecto elongato, 1.5 cm. alto, circ. 1 cm. crasso; cataphyllis lanceolatis, elongatis; foliorum petiolo 53-60 cm. longo, 4-6 mm. crasso; lamina coriacea erecta late ovato-hastata, 25-30 cm. longa, 15-16 cm. lata, apice obtusis, basi late subcordata, lobis posticis brevibus vel semi-orbicularibus, 8-8.5 cm. longis, 8-8.5 cm. latis, exitu rotundatis, sinu amplo semicirculari, lobo antico inferne 15-16 cm., superne 7-8 cm. lato, nervis primariis e basi nascentibus utrinque 4, interlobaribus et proximis liberis, nervis secundariis confertis; spatha subcoriacea reflexa, lanceolata, apice acuminata, basi decurrenti, 6.5 cm. longa, inferne 1.5 cm. lata; spadice 9-15 cm. longo, 4-15 mm. crasso, tenuiter fusiformi, stipite suffulto; tepalis in anthesi 1.8-3.5 mm. longis, 1.8-2.5 mm. latis; ovario 1.5-2 mm. longo.

Lamina of leaf rich deep green above, paler below; spathe dull green; spadix dull lavender; fruiting parts blood red (Fig. 12).

Type in herb. Chi. Nat. Hist. Mus., collected on forested south-facing slopes overlying sandstone, on "Cave Rock" above "Cave Camp", Ptari-tepuí, state of Bolívar, alt. 1810 m., October 29, 1944, *Julian A. Steyermark 59509* (2 sheets).

Apparently a member of section *Belolonchium* Schott, it is nearest *A. conjunctum* K. Krause of Bolivia and *A. Lechlerianum* Schott of Peru in leaf shape. The spathe and spadix, however, are longer than in those species. It is characterized by the lavender spadix, dull green elongated spathe, blades with 5 main nerves on each side and closely secondary nerves.

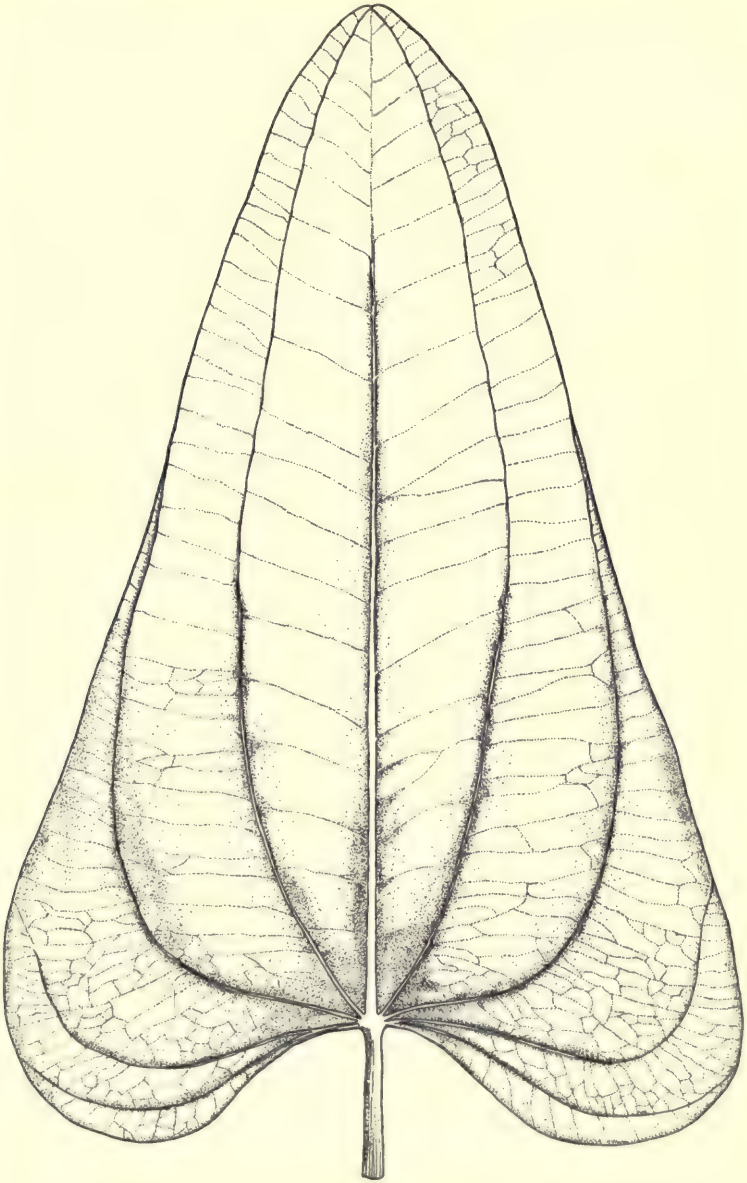

FIGURE 12

Anthurium ptarianum Steyermark

Blade and upper part of petiole (X 1/2).

Philodendron duidae Steyermark, sp. nov.

Planta terrestris; caudice crasso brevissimo; foliis basalibus; foliorum petiolo erecto tereti, 40 cm. longo, 4-10 mm. crasso, deorsum dilatato; lamina coriacea perfoliata ovato-semiorbiculari vel cordato-ovata, apice abrupte cuspidulata, basi cordata, 24-25 cm. longa, 16.5-18 cm. lata; lobo antico late ovato, inferne 16-17 cm., superne 7-10 cm. lato; lobis posticis paullo retrorsis rotundatis obtusis, 4-6 cm. longis, 5-6 cm. latis, ad 1/3-1/2 longitudinis connatis, nervis lateralibus numerosissimis aequaliter prominentibus tenuibus confertis; pedunculo 1.3 cm. longo, 1.2 cm. crasso; spatha subcoriacea ovato-lanceolata, apice acuta, infra medium constricta, 15.5 cm. longa, media 4.3 cm., basi 7 cm., prope apicem 2 cm. lata; spadice cylindrico, 10.8 cm. longo, 1.6-1.7 cm. crasso; inflorescentia foeminea quam mascula breviore, 3 cm. longa, 1.6 cm. crassa; pistillo depresso-cylindrico vel late oblongo, 1.5 mm. longo, stigmate 1.5 mm. lato rotundato paullo convexo coronata, 4-6-loculari, loculis pluribus tota longitudine loculorum insertis; inflorescentia mascula 7.8 cm. longa, 1.7 cm. crassa, parte superiore 2/3 sterili.

Leaves basal, deep green above, dull green below, the numerous fine nerves equally prominent, subhorizontally spreading to ascending in middle portion, retrorse to descending in postical lobes, ascending towards apex, marginal nerve prominent, more strongly developed than others; inflorescence arising from center of plant; spathe yellow green, suffused with salmon at base, longer than spadix; spadix whitish; staminate inflorescence sterile above in upper 2/3, the parts of the sterile portion irregularly 4-6-angled, some of the margins somewhat crenate, fleshy, 1.5-2 mm. high, those in the upper half 1.2-1.5 mm. wide, those in lower part 2-3 mm. wide across the top (Fig. 13).

Type in herb. Chi. Nat. Hist. Mus., collected among rock outcrops, Savanna Hills, summit of Cerro Duida, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58225* (2 sheets). Same locality, *Tate 830* (NY).

Evidently a member of sect. *Baursia*, since all the nerves of the leaf blade are equal, dense, and close together. This species is remarkable in possessing perfoliate leaves, the basal lobes of the blade completely surrounding the petiole. The completely sterile upper 2/3 of the staminate inflorescence is also noteworthy. At the time this species was collected by Tate from the Savanna Hills, Krause indicated (Bull. Torr. Bot. Club 58: 321. 1931) that it would prove to be a new species, but did not describe it, because only the sterile specimen was available. It is fortunate that flowering material has been obtained subsequently.

Philodendron Englereanum Steyermark, sp. nov.

Planta terrestris et epiphytica; caudice crasso; foliorum petiolo erecto tereti, 38-44 cm. longo, 3-8 mm. crasso; lamina coriacea,

subtus glauco cordato-ovata, apice abrupte cuspidulata, basi profunde cordata, 28-30 cm. longa, 16-17 cm. lata; lobo antico late ovato, inferne 16.5-17 cm., superne 8.5-9 cm. lato; lobis posticis paullo retrorsis rotundatis obtusis, 5.5 cm. longis, 6.5-7 cm. latis, nervis lateralibus numerosissimis, omnibus subaequalibus confertis subarcuatis percursatis.

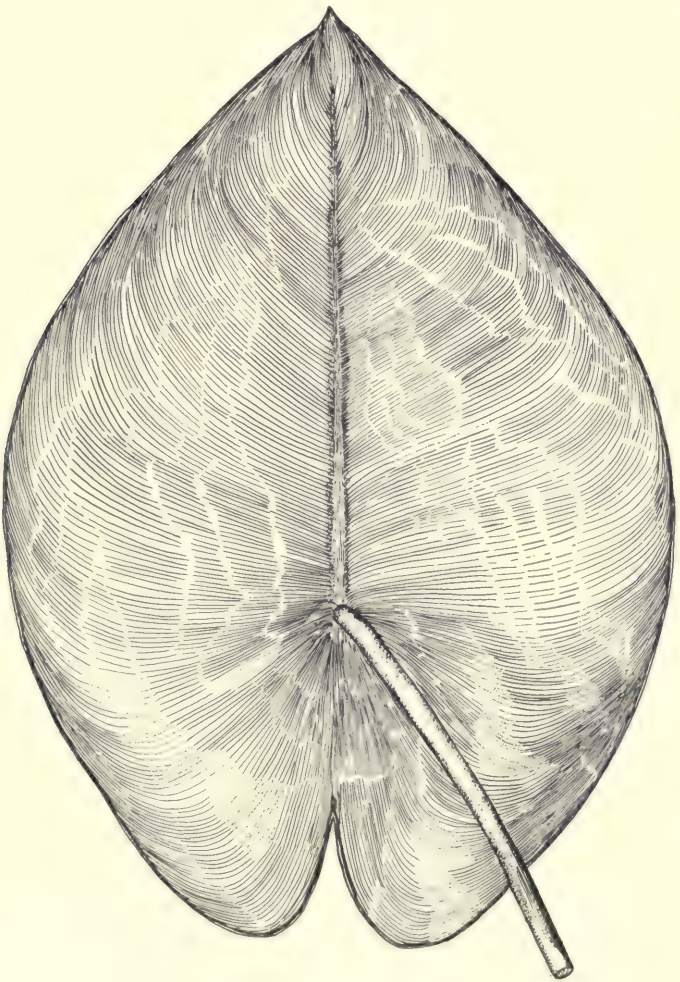

FIGURE 13

Philodendron duidae Steyermark

Blade and upper portion of petiole (X 1/2).

Lamina of leaf deep green above, glaucous-silvery below.

Type in herb. Chi. Nat. Hist. Mus., collected in dwarf wet woods, lower southeastern slopes of Carrao-tepuí, state of Bolívar, December 5-6, 1944, *Julian A. Steyermark 60863.* Another collection, with more juvenile foliage, is same locality, *Steyermark 60864.*

This species, its leaves with numerous, closely spaced, subequal nerves, is related to *P. duidae* Steyerm., described above, from which it differs in the glaucous-silvery lower leaf surface of the blades, which in a mature stage (*Steyermark 60863*) have the postical lobes divided all the way to the petiole. In juvenile leaves (*Steyermark 60864*) a subpeltate condition is found. In addition, the blades are relatively narrower, being ovate-oblong instead of ovate-suborbicular, as in *P. duidae*, and more abruptly acuminate at apex.

Philodendron Krauseanum Steyermark, sp. nov.

Caudex scandens, teres, internodiis superioribus 8-12 mm. longis; foliorum petiolo 6-11 cm. longo, vagina persistenti latiuscula, ad 17 mm. lata. apice obtusa, laminae basin haud attingenti instructo; lamina coriacea, oblongo-elliptica, apice cuspidato-acuminata, basi obtusa vel rotundata, 15-22 cm. longa, 6-8 cm. lata, nervis primariis utrinque 8, supra conspicuoribus arcuatim adscendentibus; pedunculo ca. 3.5 cm. longo; spatha extus viridi, 11-12.5 cm. longa, tubo ovoideo-oblongo, 2.5-3 cm. lato, quam lamina oblonga apice abrupte cuspidata paullum breviore; spadice cylindrico sursum paullum attenuato obtuso quam spatha breviore vel longiore, 10.5-16.5 cm. longo, 1-1.5 cm. crasso; inflorescentia foeminea, 5-7.5 cm. longa, ca. 1.5 cm. crassa; pistillo prismatico, 5 mm. longo, plerumque 4-loculari, ovulis pro loculo numerosissimis biseriatis, stigmate majusculo rotundato coronato; inflorescentia mascula 8-9 cm. longa, 1 cm. crassa; floribus masculis prismaticis.

Leaf sheath broad on both sides of petiole and extending to within 7-8 mm. of junction with blade and petiole, slightly produced beyond the insertion; leaf blades deep or rich green above, dull paler green below, midnerve prominent, especially below, 1.5 mm. wide, the 8 primary nerves on each side on lower surface of blade much more conspicuous than the fine, closely spaced, arcuate-ascending secondary and tertiary nerves.

Type in herb. Chi. Nat. Hist. Mus., collected in lower portion of Quebrada O-paru-má, tributary of Río Pacairao, below Santa Teresita de Kavanayén, state of Bolívar, alt. 915-1065 m., November 25, 1944, *Julian A. Steyermark 60567.* Also collected along wooded quebrada, Gran Sabana, between waterfall at Rué-merú (tributary of Río Kukenán) and Divina Pastora on Río Kukenan north of Santa Elena, south of Mount Roraima, state of Bolívar, alt. 1065 m., October 3, 1944, *Steyermark 59216.*

In the broad petiolar sheath this species approaches *P. lingulatum* (L.) C. Koch of the West Indies, but that has the leaf blades more

obtuse at base and a narrower petiolar sheath. In *P. lingulatum* the leaf blade is ovate, whereas in *P. Krauseanum* it is oblong-elliptic.

Philodendron ptarianum Steyermark, sp. nov.

Planta terrestris, caudice epigaeo, internodiis brevibus; cataphyllis lanceolatis, 24 cm. longis; foliorum petiolo verrucoso, supra 2-angulato, dorsaliter convexo, 6-7 cm. longo, 3.5-4.5 mm. crasso; lamina erecta coriacea, supra nitida, lanceolata, apice breviter cuspidata, basi obtusa, 23-25 cm. longa, 4.6-5.1 cm. lata, paullo inaequilaterali, costa media crassissima, supra verrucosa, basi 3-4 mm. lata, nervis lateralibus numerosissimis densissimis, omnibus subaequalibus parallelis, 1-1.25 mm. remotis, leviter arcuatim adscendentibus.

Petiole verrucose, 2-angled above, convex below, leaf blade erect, dark green and shining above, yellow green below, midnerve above verrucose, pale green.

Type in herb. Chi. Nat. Hist. Mus., collected on dry, sandy and rocky sandstone exposures on level ground adjacent to swamp on plateau-portion of southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59682.*

Apparently a member of sect. *Baursia*, and although in sterile condition, this species is well-marked by its distinctive vegetative characters of verrucose petiole and upper surface of midrib, as well as by the relatively small lanceolate leaf blades, which are shining on the upper surface, and by the elongated petioles. It is related to *P. macroglossum* Schott, *P. stenophyllum* Krause, *P. calophyllum* Brongn., and *P. insigne* Schott.

Philonotion Williamsii Steyermark, sp. nov.

Planta herbacea; foliorum petiolo 6-7 cm. longo; vagina 3.5-5 cm. longa, 5-8 mm. lata, inferne dilatata; lamina anguste lanceolata, apice 8-10 mm. longe filiformi-caudata, basi obtusa repentino contracta, 6-12 cm. longa, 13-15 mm. lata, nervis lateralibus numerosis subaequalibus tenuibus valde adscendentibus; pedunculo cataphyllo longo vaginante, subtus incluso, 19 cm. longo, 2-4 mm. lato; spatha 8 cm. longa, fauce 3.5 cm. longa, 1.5 cm. ampla, lamina cylindrica vel anguste cymbiformi, 4 cm. longa, 8 mm. lata, cuspide 8 mm. longa instructa; spadice 7 cm. longo; inflorescentia foeminea 1.5 cm. longa, 5 mm. crassa, sursum attenuata; pistillo 1.6 mm. longo, ovario elliptico-oblongo uniloculari, ovulo unico funiculo longo infra medium parietis lateraliter affixo, stigmate hemispherico-discoideo; inflorescentia mascula sterili 2-2.5 cm. longa, inferne 4 mm. crassa, mascula fertili subfusiformi, 3.5 cm. longa, medio 4.5 mm. crassa.

Petiolar sheath 1/2-3/4 length of petiole, obtuse at apex; lamina of leaf narrowly lanceolate, abruptly tipped with a filiform-caudate appendage 8-10 mm. long, midnerve somewhat prominent below, broadened near base to 1.5-2 mm. wide, the lateral nerves faint or

FIGURE 14

Philonotion Williamsii Steyermark

A, Habit (X 1/2); B, Spadix (X 1); C, Pistil, showing ovule and attachment (X 8.5).

apparently none on upper surface, faintly numerous, dense, and strongly ascending on lower surface (Fig. 14).

Type in herb. Chi. Nat. Hist. Mus., collected "en los sitios sombreados, humedos, a lo largo de la márgen de la selva, Yavita, Territorio Federal Amazonas, alt. 128 m., January 23, 1942, *Llewelyn Williams 13922*.

Philonotion has been known hitherto as an obscure monotypic genus, based upon the single species *P. Spruceanum* Schott, collected by Spruce along the Río Panuré in the Upper Amazonas region of Brazil. It is remarkable, therefore, to encounter a second species of this genus, occurring in the Amazonian drainage of Venezuela. This new species differs from *P. Spruceanum* in the much narrower, smaller, linear-lanceolate leaves with a pronounced filiform-caudate tip, a larger spathe with long filiform tip, the peduncles and inflorescence exceeding the leaves, and shorter petioles, which in *P. Williamsii* are sheathed 1/2-3/4 their length, whereas in *P. Spruceanum* the petiole is sheathed only in its lower portion.

Spathicarpa duidae Steyermark, sp. nov.

Herbe terrestris e rhizoma crassiuscula; caule adscendenti vel decumbenti, 6-9 dm. alto; foliorum petiolo 20 cm. longo, longe vaginato; lamina elliptico-ovata, apice acuminata, basi acuta, 30-35 cm. longa, medio 16-17.5 cm. lata, nervis primariis utrinque 14-15 angulo circ. 30° adscendentibus, nervis secundariis tenuibus; spatha viridi anguste lanceolata, 8 cm. longa, paullo infra mediam constricta, lamina expansa circ. 2.2 cm. lata; spadice lineari, 4 cm. longo, quam spatha breviore, tota longitudine spathae adnato; inflorescentia foeminea 3 cm. longa; pistillo subgloboso, 1.5 mm. longo, apice 1 mm. lato, stigmate disco umbonato; ovario uniloculari; ovulo orthotropo, unico.

Leaf blades coriaceous, deep green above, pale green beneath.

Type in herb. Chi. Nat. Hist. Mus., collected on Cerro Duida, southeastern-facing slopes along Caño Negro (tributary to Caño Iguapo), Terriotrio Federal Amazonas, alt. 970-1150 m., August 25-26, 1944, *Julian A. Steyermark 57994*.

Local name: "picatón".

This species is a common one at this elevation on Mount Duida. It appears to be referable to *Spathicarpa* in possessing a spadix adnate on one side for its entire length with the spathe, and in its unilocular ovary with an apparently single orthotropous ovule. It is readily distinguished from other species of the genus by the large *Dieffenbachia*-like leaves. The flowering part of the specimen is in poor condition.

Stenospermatium Pittieri Steyermark, sp. nov.

Planta terrestris vel subepiphytica; caudice erecto tereti, 9 dm.

alto; foliorum petiolo modice valido, 12-25 cm. longo, supra mediam vagina 1-1.5 cm. lata sursum angustata apice obtusa inferne dilatata instructo; lamina coriacea, elliptico-oblonga, apice abrupte breviter cuspidata, basin versus subcuneatim contracta, 16.5-32 cm. longa, 7.5-12 cm. lata, nervis primariis numerosis angulo 40° -45° a costa valida adscendentibus; pedunculo 8.5 cm. longo; spatha pallido-viridi ovata, apice abrupte acuminata, 7.5 cm. longa, 5.5 cm. lata; spadice lineari-cylindrico 4.5 cm. longo, 8 mm. crasso, stipite 8 mm. longo suffulto; pistillo 2.5 mm. longo, prismatoideo-hexagono, vertice truncato, 2.5 mm. lato; ovario uniloculari; ovulis 12-14.

Leaves dark green and shining above, silvery pale green below; spathe pale green.

Type in herb. Chi. Nat. Hist. Mus., collected on rich steep wooded slopes, Alto de Lirio, between Bramón and Las Delicias, state of Táchira, alt. 1890-2285 m., July 18, 1944, *Julian A. Steyermark 57455* (2 sheets).

This species is related to *S. maximum* Engl. and *S. multiovulatum* (Engl.) N. E. Brown, but has a shorter spadix than *S. maximum*, and a shorter spathe and spadix than *S. multiovulatum*. It is further distinguished by the large leaves, the petiole vaginate only to above the middle, and a long peduncle.

Urospatha savannarum Steyermark, sp. nov.

Planta terrestris; foliis basalibus; foliorum petiolo 58-63 cm. longo; lamina hastato-sagittata, 17-20 cm. longa, lobo antico lanceolata 9.5-11 cm. longa, 2.3-3 cm. lata, lobis posticis anguste lanceolatis vel oblanceolatis, 8-10.5 cm. longis, 1.5-1.7 cm. latis, sinu angusto parabolico sejunctis, nervis primariis lobi antici infimis adscendentibus marginem patentibus, superioribus adscendentibus in apice exeundibus, nervis primariis loborum posticorum utrinque 3 adscendentibus, in latere interiore in margine exeuntibus, latere interiore in margine exeuntibus, latere exteriore dichotomis; pedunculo 7 dm. longo; spatha lanceolata longe caudata, 18.5 cm. longa, inferne expansa circ. 2 cm. lata, superne recurvata, intus purpureo-viridi, extus brunneo-viridi; spadice lineari-cylindrico, 3.5 cm. longo, 4 mm. crasso; floris tepalis 4, spatulatis, 2.5 mm. longis, apice rotundatis 1.8 mm. latis; pistillo oblongo-cylindrico, 2 mm. longo; ovario uniloculari; ovulo unico; staminibus 4; filamentis latiusculis 1 mm. longis, 1 mm. latis.

Leaves grass green above, dull green below; inflorescence erect; spathe recurved above, lavender-green within, bronze green without; spadix pale gray-green above, pale gray-lilac below with brown-lavender spots; ovary 1-celled, the single ovule arising from the base at one side (Fig. 15).

Type in herb. Chi. Nat. Hist. Mus., collected along rill in savanna, Sabana Grande, at southeastern base of Cerro Duida, Territorio

Federal Amazonas, alt. 200 m., August 23, 1944, *Julian A. Steyermark 57853.*

This remarkable plant is distinguished from all other members of the genus by the unilocular 1-ovulate ovary, the usual condition being incompletely 2-locular with 2 or more ovules. It is further distinguished by the 4 perianth segments and 4 stamens of each flower, the short slender spadix, relatively narrow long-caudate spathe, and the narrow lanceolate to oblanceolate postical lobes and the relatively small antical lobe of the leaf blade. The spathe and spadix are shorter than in *U. caudata* (Poepp. & Endl.) Schott and *U. sagittifolia* (Rodsch.) Schott, and the leaf blades are shorter than in those species. It appears most closely related to *U. decipiens*

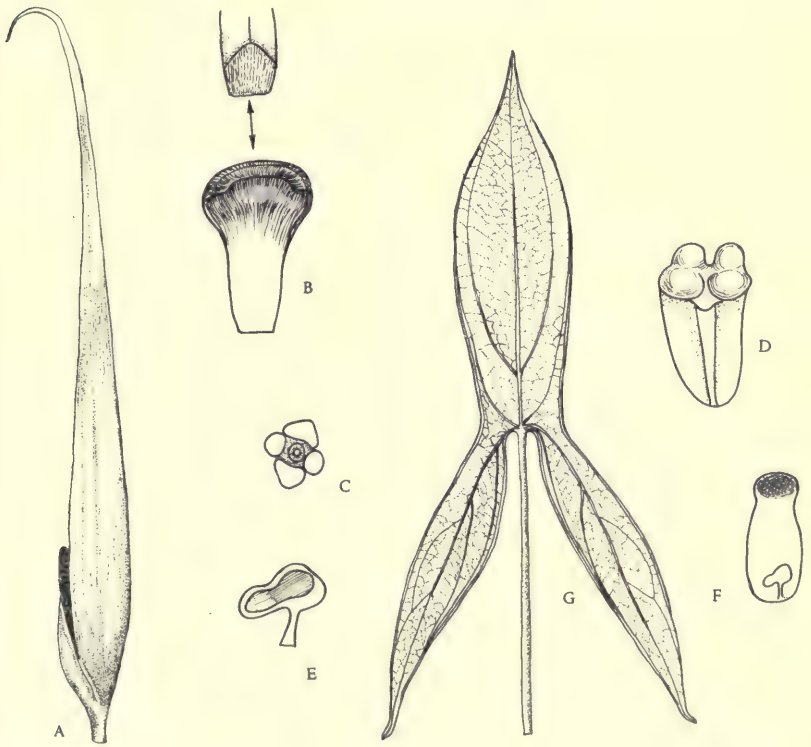

FIGURE 15

Urospatha savannarum Steyermark

A, Spathe and part of spadix, lateral view (X 1/2); B, Perianth segment (X 9), upper half, from above, lower half, from side; C, Flower, from above (X 10); D, Staminate cluster (X 15); E, Ovule (highly magnified; F, Pistil, showing ovule in position (X 6); G, Blade and upper portion of petiole (X 1/2).

Schott and *U. dubia* Schott, which have the cells of the ovary 2-ovulate. *Urospatha savannarum* may represent a stage towards reduction in the evolutionary trend from species, such as *U. dubia* and *U. decipiens*, having 2 ovules.

So far as the single-celled, 1-ovulate ovary is concerned, *U. savannarum* is anomalous as a member of the genus *Urospatha*. But in features of the stamens and morphology of the perianth segments, and in the structure of the elongated spathe, it agrees with other members of this genus. It resembles the genus *Dracontioides* in having the ovary 1-ovulate, but that has a spathe which is shortly convolute below and fomiculate above, features altogether lacking in *U. savannarum*. It is probable that a special section of the genus should be set aside for this new species.

XYRIDACEAE

Abolboda macrostachya Spruce, var. **robustior** Steyermark, var. nov.

Planta caespitosa; foliis rigidis coriaceis pungentibus, 18-42 cm. cm. longis, 9-23 mm. latis, marginibus involutis; scapo 50-60 cm. longo, 5-6 mm. lato; spicis elliptico-oblongis vel fusiformibus, usque ad 5.5 cm. longis, 1.3 cm. crassis; bracteis ovatis vel late oblongis, acuminatis vel mucronatis, subcoriaceis, marginibus scariosis integerrimis, 13-15 mm. longis, 6-7 mm. latis.

Leaves in rosette, rich green; floral bracts brown-lavender with scarious margins; corolla deep blue.

Type in herb. Chi. Nat. Hist. Mus., collected in sandy wet meadow, Gran Sabana, between Mission of Santa Teresita de Kavanayén, northwest to Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59349* (2 sheets). Also collected in swamp, vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepuí, alt. 1615 m., November 15-17, 1944, *Steyermark 60243*.

From typical *A. macrostachya* spruce, this differs in the much larger leaves, longer bracts of the scape, more elongated scapes, and thicker heads of flowers.

Abolboda ptaritepuiana Steyermark, sp. nov.

Caules adscendentes foliati, steriles usque ad 1.2 m. alti; foliorum vaginis membranaceis fuscis, vetustis squamosis praesecantibus; foliis erectis firme membranaceis planis lineari-lanceolatis, 12-15 cm. longis, 10-12 mm. latis, acuminatis, glaberrimis, supra viridibus, subtus argenteis, basi purpureis, marginibus fuscis; scapo tereti, 39 cm. longo, 5-7 mm. crasso, glaberrimo; floribus capitatis, capitulis floriferis, 6 cm. longis, 8 cm. crassis; bracteis ovatis vel late lanceolatis, 3.2-4.2 cm. longis, 5-12 mm. latis, marginibus integerrimis.

Sterile stems leafy above, the sheaths in age shredding into brown scaly segments; leaves of sterile stems firmly membranaceous, those of fertile stems somewhat more rigidly pointed and slightly broader at base.

Type in herb. Chi. Nat. Hist. Mus., collected in dense thickets, Ptari-tepui, *Bonnetia roraimae* forest on southwest-facing shoulder, state of Bolívar, alt. 2000-2200 m., November 2, 1944, *Julian A. Steyermark 59760* (2 sheets).

This species, although closely related to *A. sceptrum* Oliver, differs from that species in the elongated leafy stem, the prominent, brown-scaly shredding leaf sheaths, leaves less rigid and not as prominently pungent-tipped, green instead of silvery-blue on the upper leaf surface, entire or subentire margins of the floral bracts, which in the fruiting condition are shorter and erect-ascending, instead of divaricately spreading as in *A. sceptrum*, and much more slender peduncles.

Abolboda rigida (Malme) Steyermark, comb. nov.

Abolboda grandis Griseb. var. *rigida* Malme, Bull. Torr. Bot. Club **58**: 326. 1931.

This appears distinct from *A. grandis* in the broader, pungent, stiff leaves of coriaceous instead of subcoriaceous texture, and larger heads with larger bracts and flowers.

The leaves are described by Malme as 12-17 cm. long and 8-10 mm. wide, but *Steyermark 58181* from the summit of Mount Duida has leaves measuring 23-24 cm. long and 15-19 mm. wide, and has bracts measuring normally 14-15 mm. long. Malme describes the bracts as "circiter 10 mm. longae, usque 5 mm. latae". The variety was originally described from Mount Duida (*Tate 586*), and later collected also on Mount Auyan-tepui (*Tate 1208, Cardona 116, 203*).

Xyris albescens Steyermark, sp. nov.

Caespitosa satis robusta; foliis erectis subcoriaceis ensiformi-linearibus, apice valde falcato-incurvatis et obtusis subtiliter nervoso-striatis, marginibus dense ciliatis pilis albidis instructis, 40-75 cm. longis, 4-6 mm. latis; vagina tertiam vel quartam partem folii occupante, basin versus ferrugineo-castanea vel atro-castanea, nitida, eciliata; scapo recto ancipiti, marginibus dense ciliatis pilis albidis instructis, 60-75 cm. longis, 2-3 mm. latis; spicis subglobosis, multifloris, 1.2-1.5 cm. longis, 1.2-1.7 cm. crassis; bracteis subcoriaceis nigris vel fusco-nigris (vivis), decussatis, confertim erecto-adpressis vel paullo patentibus, infimis sterilibus, late ovato-oblongis vel late oblongis, ceteris late oblongis, integerrimis, apice rotundatis, 8-10 mm. longis, 5-6 mm. latis, area dorsali nulla; sepalis lateralibus liberis paullo inaequilateris, anguste lanceolatis, acutis, 8 mm. longis, 1-1.2 mm. latis, fuscis, ala carinali in parte tertia superiore ciliato-scabridula.

FIGURE 16

Xyris albescens Steyermark. A, Tip of blade, showing recurved portion (X 1/3); B, Petal (X 1.5).

Xyris esmeraldae Steyermark. C, Upper part of flowering scape with spike (X 1.5).

Xyris lanulobractea Steyermark. D, Stamen (X 6); E, Portion of hairs at base of filament (highly magnified); F, Bract, showing dorsal area and pubescence at summit (X 3); G, Petal (X 1.5); H, Staminodium (X 6).

Xyris ptariana Steyermark. I, Petal (X 1); J, Cluster of uppermost leaves in position, showing recurved ligule (X 2/3).

Xyris stenostachya Steyermark. K, Uppermost part of scape with spike (X 1); L, Middle part of blade (X 3).

Petals 8.5 mm. long, the blade 6 mm. long, 4 mm. wide, broadly elliptic-ovoid, subobtuse, margins erose from tip to near base, claw 3 mm. long; anther linear, 2.5 mm. long; filament 1 mm. long; staminodium long penicillate-plumose at apex with hairs 2 mm. long; style branches 3, 3 mm. long, slightly penicillate and truncate at tip (Fig. 16, a-b).

Type in herb. Chi. Nat. Hist. Mus., collected on Ptari-tepuí, *Bonnetia roraimae* forest on southwest-facing shoulder, state of Bolívar, alt. 2000-2200 m., November 2, 1944, *Julian A. Steyermark 59734.* Also collected in swamp, Ptari-tepuí, on plateau portion of southeast-facing slopes, alt. 1600 m., November 1, 1944, *Steyermark 59683.*

Apparently a member of Sect. XII (*X. spectabiles* Malme) [published as Stirps *X. spectabilis*, but undoubtedly intended as plural, as all other sections are so designated by Malme with plural endings], and most closely related to *X. decussata* Gleason of Mount Roraima, which it resembles in the falcate-incurved rounded or obtuse leaf tips, pubescent margins of leaves and scapes, and decussate dark-colored bracts lacking a definite dorsal area. It differs from that species in the white instead of dark brown hairs of the margins of scapes and leaves, recurved-falcate inequilateral leaf tip, much longer leaves and scapes, more robust habit, larger heads, bracts, and lateral sepals, and longer sheaths of an orange-brown to dark castaneous brown color.

In its strongly flattened, broad scape with pubescent margins of the leaves and scapes, it is reminescent of *X. eriophylla* Reichenb., but that has a definite dorsal area on the bracts, densely villous upper part of the lateral sepal, and transversely rugose leaves.

Xyris capillaris Steyermark, sp. nov.

Caespitosa; foliis rubrescentibus planis setaceis, acutis, 0.5-3 cm. longis, 0.1-0.2 mm. latis, omnino glaberrimis; vagina circiter tertiam vel fere dimidium partem folii occupante, basin versus pallido-brunnea, scariosa, eciliata; scapo subtereti tenuissimo, glabro, 1.5-1.9 cm. alto; spicis anguste ellipticis, 1-floris, 3-4 mm. longis, 0.8-1 mm. latis; bracteis membranaceis brunneis, 2 infimis brevissimis, anguste lanceolatis, 2-2.1 mm. longis, glabris, bracteis intermediis et superioribus lanceolatis, 3-4 mm. longis, albido-maculatis, marginibus scariosis; ovario et capsula uniloculari; seminibus plerumque 2.

Leaves copper-colored; placentae basal-central, ovules numerous, attached to long, ascending funicles; seeds 2 or more, minute, ellipsoid, reddish-brown.

Type in herb. Chi. Nat. Hist. Mus., collected between Esmeralda Savanna and southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 22, 1944, *Julian A. Steyermark 57835.*

Also collected in savanna and shrubby growth bordering forest of Río Karuai, between Santa Teresita de Kavanayén and base of Ptaritepuí, state of Bolívar, alt. 1220 m., November 18, 1944, *Steyermark 60306.*

So far as known, this is the species having the most delicate and slender leaves and flowers in the genus. It is most closely related to *X. filiscapa* Malme of Manaos, Brazil, from which it differs in the shorter, narrower, entirely glabrous leaves, shorter and more slender scapes or culms, and 1-flowered inflorescence.

At first, it was thought that this species might represent a reduced, starved, or dwarf state of *X. filiscapa,* but, in addition to the more slender and shorter leaves, scapes, and spikes, the leaves themselves are completely glabrous, lacking the ciliation characteristic of *X. filiscapa,* as exhibited, for example, in *Williams 13996.* Since our material possesses mature capsules and seeds, it cannot be considered as representing immature or dwarfed plants.

Xyris culmenicola Steyermark, sp. nov.

Caespitosa; foliis subcoriaceis ensiformi-linearibus, apice acutis vel paullo falcato-incurvatis, valde nervoso-striatis, marginibus dense ciliatis pilis albidis instructis, 15-30 cm. longis, 2-3.5 mm. latis; vagina quartam vel quintam partem folii occupante, inferne atro-castanea nitida, eciliata; scapo erecto ancipiti, ecostato, omnino glabro, 35-45 cm. longo, 1.5-2 mm. lato, aciebus obtusis; spicis elliptico-ovatis, basi paullo contractis, multifloris, 14 mm. longis, 7-11 mm. crassis; bracteis coriaceis, nigricantibus vel fusco-nigris, concoloribus, opacis, ovalibus vel late oblongis apice paullo laceratis, inferioribus et intermediis apice emarginatis, sub apice rotundatis et paullo carinatis, 7-8 mm. longis, 3.8-4.5 mm. latis, area dorsali nulla; sepalis lateralibus liberis, lineari-oblanceolatis, acutis, 7 mm. longis, 1.1-1.2 mm. latis, dorso castanea, ala carinali angusta, in parte dimidia superiore ciliato-scabrida.

Heads somewhat thicker in dried state; carinal wing of lateral sepals ciliolate in upper half, the cilia longer near the tip; ovules on basal placentae; seeds few (2-9), elongated, tailed at one end with whitish appendages 0.5 mm. long; body of seed linear-oblong, 2.25 mm. long. 0.4 mm. wide, pale brown, the surface smoothish.

Type in herb. Chi. Nat. Hist. Mus., collected around small stream on dry rocky slopes, summit of Cerro Duida, Brocchinia Hills, Territorio Federal Amazonas, alt. 1700-1980 m., September 1, 1944, *Julian A. Steyermark 58198*; also collected in Savanna Hills, summit of Cerro Duida, alt. 1025-1200 m., September 2, 1944, *Steyermark 58233.*

Closely related to *X. lugubris* Malme, also from the summit of Duida, but differing from that species in having the margins of the leaves conspicuously densely white-ciliate, the leaves strongly

longitudinally nerved, whereas in *X. lugubris* they are impressed-nerved with numerous conspicuous pale puncticulate stomata, the ligules of the sheaths not lacerate, and the bracts of the heads less conspicuously lacerate on the margins.

Xyris esmeraldae Steyermark, sp. nov.

Caespitosa subbulbosa, aphylla vel folia obsoleta; scapis numerosis tenuibus, subteretibus, valde spiraliter tortis, 12-20 cm. altis, 0.5 mm. latis, omnino glabris; spicis ellipticis vel fusiformibus, 4-4.5 mm. longis, 1-1.5 mm. latis; bracteis 2 infimis late oblongis vel ovato-oblongis, obtusis, 2 mm. longis, 1 mm. latis, marginibus scariosis, ceteris ad 3.5 mm. longis, ad 4 mm. latis; sepalis lateralibus lanceolatis, 3 mm. longis, 1 mm. latis, apice denudatis, ala carinali parce denticulata; capsula uniloculari, 3-valva.

Plant semi-bulbous at base; leaves reduced to short bracts at base or absent; seeds at base of capsule on long erect funicles (Fig. 16,c).

Type in herb. Chi. Nat. Hist. Mus., collected in swampy woods between Esmeralda Savanna and southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 22, 1944, *Julian A. Steyermark 57821.*

The fact that the specimen is not in flowering condition makes its exact position in the genus somewhat uncertain, but there is no doubt but that it pertains to the subgenus *Nematopus* Seubert. The possession of lateral sepals naked at the apex and denticulate on the keel would place it probably in Sect. V. of Malme (*X. Hymenachnes*) and, because of its spirally twisted scapes, near *X. tortula* Mart. and *X. simulans* Alb. Nilsson var. *subtortula* Malme. From these species, *X. esmeraldae* may be distinguished by the smaller, narrower spikes, smaller lateral sepals, conspicuously spirally twisted narrow scapes, and leafless condition.

Xyris lanulobractea Steyermark, sp. nov.

Caespitosa; foliis erectis subteretibus coriaceis subsetaceis, apice subulatis, subtiliter striatulatis, omnino glabris, 18-44 cm. longis, 0.5-1 mm. latis; vagina sextam vel nonam partem folii occupante, inferne castanea, nitida, eciliata; scapo erecto vel basin versus paullo torto subtereti subtiliter striatulato, omnino glabro, 40-50 cm. longo, 1 mm. lato; spicis ovato-ellipsoideis vel ovoideis multifloris, 9-11 mm. longis, 6-7 mm. crassis; bracteis coriaceis, brunneis praeter apices, infimis parvissimis sterilibus, late oblongis vel oblongo-suborbicularibus, apice rotundatis, 3-5 mm. longis, 2.5-3.5 mm. latis, intermediis superioribusque fertilibus, late oblongis vel rhomboideo-oblongis, 5 mm. longis, 4-4.5 mm. latis, area dorsali distincta oblonga sub apice obtusa et irregulariter reticulata, supremis dense longe ciliatis, ceteris parte superiore et apice dense albido-lanuginosis; sepalis lateralibus liberis, paullo inaequilateris, oblanceolatis, 5 mm. longis, 0.9-1 mm. latis, apice villosis, ala carinali in parte quarta superiore dense fimbriato-villosis pilis

albidis; petalis 8 mm. longis, lamina 4 mm. longa, 5 mm. lata, apice grosse erosa; filamentis 1 mm. longis, basi pilosis pilis ad 2 mm. longis instructis; antheris 1.3 mm. longis; staminodiis longe penicillatis.

Petals longer than the bracts and sepals, obovoid-cuneate, the blade abruptly narrowed to a long slender claw 4 mm. long and 0.5 mm. wide, lamina erose or toothed at apex with relatively coarse broad projections; ovary 2 mm. long; style filiform, 3 mm. long; style branches 3, filiform, 2 mm. long, tipped by slightly fimbrillate stigmas (Fig. 16, d-h).

Type in herb. Chi. Nat. Hist. Mus., collected on swampy ground following streamlet, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59336.*

This is a member of Sect. XXI. of Malme (*X. pilosae*), and most closely related to *X. globosa* Alb. Nilsson of the upper Orinoco (*Spruce 3244*), near Esmeralda, Venezuela. It differs from *X. globosa* in the larger and more broadly ovoid heads with denser and longer hairs on the upper part of the bracts, in *X. globosa* being shorter and more scattered, the dorsal area of the bracts less pointed at tip and relatively wider, the anthers exserted on conspicuous filaments, and the conspicuously long-penicillate staminodia.

Xyris ptariana Steyermark, sp. nov.

Caespitosa, robusta, elata; foliis manifeste distichis rigidis coriaceis, ensiformi-linearibus, quam scapo brevioribus, laevibus, aciebus acutis, apice falcato-incurvatis et obtusiusculis vel acutiusculis, valde nervoso-striatis, 12-20 cm. longis, 3-5 mm. latis, omnino glabris; vagina circiter dimidiam partem folii occupante, ligula distincte limitata, saepe recurvato-revoluta, eciliata, inferne castanea, nitida, 9-12 cm. longa, deorsum sensim dilatata; scapis rectis, superne ancipitibus et bicostatis, inferne unicostatis, laevibus, omnino glabris, 30-38 cm. longis, 1-1.2 mm. latis; spicis obovoideo-subglobosis, multifloris, 11-13 mm. longis, 5-10 mm. latis; bracteis subcoriaceis integerrimis, fuscis concoloribus praeter margines scariosos, nitidis, glabris, 5-8 infimis et exterioribus sterilibus parvisque oblongo-obovatis, 4-5 mm. longis, apice rotundatis vel obtusis, 6-7 intermediis superioribusque fertilibus late oblongis, 8-9 mm. longis, 4-5 mm. latis, sub apice rotundatis vel obtusis, emarginatis vel retusis; sepalis lateralibus liberis, inaequilateris, oblanceolatis, 6.5-7 mm. longis, supra medium 1.2-1.5 mm. latis, ala carinali in parte superiore minute papillato-scabridula; petalis rhomboideo-cuneatis, 9 mm. longis, supra medium 6 mm. latis; filamentis 1 mm. longis, 0.5 mm. latis; antheris 1.3 mm. longis; staminodiis 3, 4.5 mm. longis, superne dilatatis et penicillatis.

Forming dense tufts; leaves dark green with brown at base; ligule typically recurved-revolute or spreading and becoming squarrose;

spike 5-6 mm. wide in fresh condition, up to 10 mm. wide in dried state with loosely spreading bracts; petals faintly many-nerved, slightly wavy-margined on top, the rhomboid blade narrowed below the middle to a cuneate claw; filament inserted somewhat below the middle near the junction of the claw and the blade of the petal; staminodia penicillate-plumose above with pale yellow hairs; placentae basal; ovules numerous (Fig. 16, i-j).

Type in herb. Chi. Nat. Hist. Mus., collected on wet bluffs under constant spray of swinging waterfall, Ptari-tepuí, along base of east-facing high sandstone bluffs, state of Bolívar, alt. 2410-2450 m., November 7, 1944, *Julian A. Steyermark 59919.*

Xyris ptariana belongs to the same group of species as *X. Tatei* Malme and *X. witsenioides* Oliver and is intermediate between these two. At one end of the series stands *X. witsenioides*, while at the other end is *X. Tatei.* By broadening the leaves and enlarging and elongating the sheaths and scapes of *X. witsenioides*, a condition, more or less like that found in *X. ptariana* is reached, and, by continuing one step further, again widening the leaves and scapes of *X. ptariana*, the state of *X. Tatei* is reached. *Xyris ptariana* has somewhat larger heads and broader leaves and scapes than has *X. witsenioides*, but narrower leaves and scapes than *X. Tatei.*

Like *X. Tatei*, to which *X. ptariana* is most closely related, the tip of the leaf is prominently incurved-falcate and obtusish, whereas in *X. witsenioides* it is scarcely or not at all falcate and more gradually narrowed to an acute or acuminate apex. In *X. ptariana*, however, the lower part of the scape is angled on one side, as in *X. witsenioides*, rather than bicostate and biangulate throughout, as in *X. Tatei.* In *X. ptariana* the keel of the lateral sepal is somewhat less scabrid than in *X. witsenioides.* The most conspicuous characteristic of *X. ptariana*, however, is the ligule, which is typically recurved-revolute; in *X. witsenioides* the ligule is produced upwards and erect or straight or protrudes slightly as a small or elongated structure, whereas in *X. Tatei* it is spreading-squarrose at the tip. This is seen best developed, in the species mentioned, on the sheaths of the uppermost and youngest leaves.

Xyris scabridula Steyermark, sp. nov.

Caespitosa; foliis rigidis coriaceis, flexuosis vel nonnihil laxe spiraliter tortulis, subcomplanatis vel subteretibus, profunde sulcatis, glabris, quam scapis multo brevioribus, 6-12 cm. longis, 1-1.5 mm. latis, acicbus subobtusis; vagina scabridula, inferne fusca nitida; scapis atro-viridibus rectis vel nonnihil flexuosis laxe tortulis, subteretibus, subtiliter sulcato-nervatis, 19-26 cm. longis, 0.75-1 mm. latis; vagina basali purpurea, 6-7 cm. longa, nitida; spicis paucifloris, ovoideis, 6-7 mm. longis, 3.5-4 mm. crassis; bracteis coriaceis, integerrimis, adpressis fuscis concoloribus, infimis sterilibus late oblongis, 3 mm. longis, apice rotundatis, intermediis superioribusque late oblongis, 5-6 mm. longis, 3-4 mm. latis, apice rotundatis,

omnibus glabris, area dorsali nulla; sepalis lateralibus fere aequilateris, late lanceolatis, ala carinali e basi ad apicem manifeste scabridulo-ciliata.

Type in herb. Chi. Nat. Hist. Mus., collected around rills on rocky dry ridge top, summit of Cerro Duida, Brocchinia Hills, Territorio Federal Amazonas, alt. 1700-1980 m., September 1, 1944, *Julian A. Steyermark 58168*; same locality, but in slightly more moist places, *Steyermark 58178*. The last collection, although sterile, is undoubtedly referable to this new species. It has leaves up to 40 cm. long, and the sheaths at the base are much more conspicuously scabridulous than in the type specimen.

This species is related to *X. stenophylloides* Malme, also from the summit of Duida, and to *X. stenophylla* Alb. Nilsson. It is characterized by the scabridulous-ciliolate keel of the lateral sepals, the torulose leaves and scapes, small few-flowered heads with dark brown bracts without a dorsal area, the purple sheaths of the flowering scapes, and the strongly sulcate-nerved leaves and scapes. From *X. stenophylloides* it may be distinguished by the scabrid-ciliolate, instead of entire eciliate keel of the lateral sepal, purlish instead of brown sheaths of the scape, and scabridulous instead of glabrous leaf sheaths. From *X. stenophylla* it differs in the shorter, more rigid, and more prolonged leaf sheaths, scabrid instead of ciliate leaf sheaths, and shorter differently shaped lower bracts of the heads.

Xyris setigera Oliver, var. **elongata** Steyermark, var. nov.

A typo differt foliis longioribus et marginibus ciliatis brevioribus remotioribus.

Leaves 15-30 cm. long, the margins with shorter and less crowded cilia than in the species.

Type in herb. Chi. Nat. Hist. Mus., collected on dry sandy and rocky sandstone exposures on level ground adjacent to swamp on plateau portion of southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59660*; Ptari-tepuí, *Brocchinia-Stegolepis-Heliamphora* swamp on southwest-facing shoulder, alt. 2200 m., November 2, 1944, *Steyermark 59782*; swampy ground following streamlet, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mesa, alt. 1220 m., October 26, 1944, *Steyermark 59336a;* and savanna, vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepuí, alt. 1615 m., November 15-17, 1944, *Steyermark 60239*.

From typical *X. setigera* Oliver of Mount Roraima, this variety has become differentiated by elongating the leaves and in reducing the size and number of the cilia on the leaf margins.

Xyris stenostachya Steyermark, sp. nov.

Caespitosa; foliis ensiformi-linearibus complanatis valde transverse rugulosis, glabris, 10-15 cm. longis, 2-3 mm. latis, marginibus incrassatis; vagina membranacea, brevi, glabra; scapis tenuibus subteretibus transverse rugulosis, 17-30 cm. longis, 0.5-0.6 mm. crassis; spicis lineari-cylindricis, acutis vel subacutis, 20-26-floris, 16-34 mm. longis, 2.5-3 mm. latis; bracteis firme membranaceis, pallido-viridibus, marginibus pallido-brunneis subscariosis, integerrimis, ovato- vel elliptico-oblongis, apice obtusis vel rotundatis, 7 mm. longis, 3 mm. latis, area dorsali bene evoluta; sepalis lateralibus liberis, lanceolatis, acutis, 5.25-5.5 mm. longis, 0.8-1 mm. latis, ala carinali parce et minute ciliolata, aliter glabra; petalis oblongis, apice irregulariter eroso-dentatis, 3 mm. longis, circiter 1 mm. latis; filamentis 1 mm. longis, glabris; antheris 0.7 mm. longis; staminodii ramis penicillatis (Fig. 16, k-l).

Type in herb. Chi. Nat. Hist. Mus., collected among rock outcrops below mouth of Río Sanariapo, along Orinoco river, Territorio Federal Amazonas, alt. 100 m., September 8, 1944, *Julian A. Steyermark 58437.*

A member of subgenus *Nematopus* Seubert, Sect. IV. of Malme (*X. paraënsis*), this species is closely related to *X. longiceps* Malme, from which it differs in the transversely rugulose leaves and scapes, and longer and more slender spikes. It is also related to *X. savannensis* Miquel, differing from that species in the more elongated narrow spikes.

ERIOCAULACEAE [10]

Carptotepala Moldenke, gen. nov.

Flores trimeri androgyni. Bracteae involucrati paucae imbricatae squarrosae. Receptaculum dense longeque villosum. Bracteae receptaculi nullae. Flores masculi centrali; sepala 3 libera glabra; receptaculum ultra calycem in stipitem angustum productum corollam staminaque gerens; petala 3 libera firma adscendentes glabra; stamina 3 libera; filamenta elongata. Flores femini peripherati; sepala 3 libera glabra; petala 3 libera elongata erecta in medio constricta, ad apicem saepe appendiculata; stylus brevissimus, appendicibus 3 ornatis; stigmata 3 brevissima recurvata.

Flowers trimerous, androgynous; involucral bractlets rather few, imbricate, squarrose; receptacle densely long-villous; receptacular bractlets absent; staminate florets central in the head, easily detached, their sepals 3, separate, glabrous; the remainder of the floret inserted at the apex of a prolongation of the receptacle; their petals 3, separate, firm, ascending, glabrous; stamens 3, inserted alternate to the petals, free; filaments elongate; anthers sagittate, versatile, composed of 2 thecae, each dehiscing by means of a longitudinal slit; rudimentary ovary present at the base of the stamens; pistillate florets peripheral, firmly attached to the receptacle, with all the floral parts inserted at one level; their sepals 3, separate, glabrous; their petals 3, separate, elongate, erect, narrowed in the middle, often appendaged at the apex; style very short; stigmas 3, very short, recurved; style-appendages 3, issuing from the same level as the stigmas, elongate, erect, fimbriate; ovary large, 3-angulate or 3-alate, 3-celled, 3-ovulate.

This genus is known thus far only from the type species *C. insolita* Moldenke, which exhibits most remarkable floral characters. Among its distinctive characters are the definitely central and loosely attached staminate florets and the distinctly peripheral firmly attached pistillate florets; the prolongation of the floral receptacle (regarded as such in the absence of detailed morphological examination) above the calyx in the staminate florets; the free elongate stamens; the completely separate sepals and petals in flowers of both sexes; the elongated exserted petals of the pistillate florets, with their narrowed mid-portion and caudate appendage; and the 3-alate ovary. The generic name is compounded from the Latin word "carptim", meaning in separate parts, and the latinized French word "tepal", meaning a division of the perianth.

Carptotepala insolita Moldenke, sp. nov.

Herba parva caulescens; caulibus gracilibus 4-6 cm. longis rectis simplicibus ad apicem longe villosis; foliis numerosissimis rectis

[10] By Harold N. Moldenke

linearibus 4.5-8 cm. longis multistriatis non fenestratis utrinque glabris vel ad basin plusminusve longe villosis; vaginis cylindricis angustis arcte adpressis glabris ca. 3.5 cm. longis; pedunculis stramineis vel flavis 15-25 cm. longis 3-costatis tortis glabris.

Small caulescent herb; stems slender, 4-6 cm. long, completely hidden by the sheathing leaf-bases, erect, apparently unbranched, long-villous at the summit; leaves very numerous, erect, linear, grass-green, thin-membranous, 4.5-8 cm. long, rather regularly attenuate from the acute apex to the ampliate and sheathing base, about 1.5 mm. wide at the mid-point, many-striate, not fenestrate, glabrous on both surfaces or more or less long-villous on the subhyaline margins of the top of the sheathing base; sheaths cylindric, narrow, closely appressed to the peduncles, shorter than the leaves, about 3.5 cm. long, glabrous, many-striate, slightly twisted, obliquely split at the apex, the blade ovate-lanceolate, appressed to the peduncle, about 7 mm. long, acute, glabrous; peduncles about 3 per plant, slender, stramineous or yellow, 15-25 cm. long, 3-costate, twisted, glabrous, shiny; heads solitary, turbinate, 4-5 mm. long, 3-4 mm. wide; involucral bractlets rather few, closely imbricate in several series, oblanceolate-spatulate, about 1.9 mm. long and 0.8 mm. wide, firm, stramineous or light-brown, rounded at the apex, more or less squarrose, glabrous on both surfaces, shiny, concave on the inner, convex on the outer surface; receptacle long-villous; receptacular bractlets absent; staminate florets central in the head, loosely attached; sepals 3, separate to the base, inserted about 0.4 mm. below the remainder of the floret, narrowly elliptic, yellowish, about 1.9 mm. long and 0.4 mm. wide, subacute at the apex, glabrous throughout, not bearded, not glanduliferous, firm, erect or spreading; petals 3, separate to the base, elliptic, about 2.1 mm. long and 0.8 mm. wide, obtuse at the apex, yellowish, thin-textured, firm, ascending, glabrous throughout, not bearded, not glanduliferous, not involute; stamens 3, separate and free to the base, alternate with the petals; filaments flattened, about 1.8 mm. long, glabrous; anthers sagittate, versatile, about 0.4 mm. long, 0.2-0.3 mm. wide, the 2 thecae separate and opening by longitudinal slits; ovary rudimentary, at the base of the stamens and petals, dark-brown, about 0.2 mm. long and wide, 3-angled, 3-celled, sometimes surmounted by a very abbreviated 3-parted style; pistillate florets peripheral in the head, all its parts borne at one level: sepals 3, separate to the base, oblong, firm, brownish, ascending, about 1.6 mm. long and 0.3 mm. wide, acute at the apex, glabrous on both surfaces, not bearded, not glanduliferous; petals 3, separate to the base, elongate-linear, erect, narrowed in the mid-portion, to 4.2 mm. long, about 0.2 mm. wide for the lowest 1.2 mm. above the base and there hyaline, then narrowed to about half that diameter for about 0.4 mm., then expanded to 0.15 mm. and somewhat involute and brownish for about 0.8 mm. or more, acute at the apex, the apex often surmounted by a terminal caudate erect of spreading appendage to 0.8 mm. in length, the lowest expanded hyaline portion of the petal long-hirsute on the back, the

remainder glabrous, not bearded, not glanduliferous: style very short, about 0.1 mm. long, glabrous, terminated by 3 recurved-spreading stigmas of about similar length and 3 elongated erect fimbriate appendages about 0.8 mm. long and dark-brown at the apex; ovary large, elliptic, about 0.8 mm. long and 0.4 mm. wide, broadly 3-angulate or -alate, glabrous, 3-celled.

Type in herb. New York Botanical Garden, collected by a waterfall in a swampy savanna between Río Karuai and Salto de Iraba-naima along the Río Karuai, at the southwestern base of Ptari-tepui, state of Bolívar, alt. 1220 m., November 28, 1944, *Julian A. Steyermark 60703*.

Eriocaulon dimorphopetalum Moldenke, sp. nov.

Herba; foliis caespitosis tenuiter membranaceis saepe pellucidis patentibus 2-6 cm. longis longe attenuatis fenestratis glabris; vaginis laxis 3-5.5 cm. longis pellucidis fenestratis glabris, ad apicem subtruncatis fissisque; pedunculis paucis erectis stramineis vel brunneis 5-9 cm. longis 3-costatis glabris tortis; capitulis brunnescentibus glabris hemisphaericis 5 mm. diam.; floribus dimeris.

Herb; stems very abbreviated; leaves cespitose, thin-membranous, often pellucid, wide-spreading, 2-6 cm. long, 1-2 cm. wide at the mid-point, long-attenuate, fenestrate, glabrous on both surfaces; sheaths loose, 3-5.5 cm. long, pellucid, fenestrate, glabrous, subtruncate and split at the apex; peduncles 5 or more per plant, erect, stramineous or brownish, 5-9 cm. long, 3-costate, glabrous, slightly twisted; heads light brown (at least, when dry), hemispheric, about 5 mm. in diameter, smooth; involucral bractlets few, stramineous or light-brown, broadly elliptic, about 2 mm. long and 1.8 mm. wide, rounded at the apex, glabrous; receptacle glabrous; receptacular bractlets elliptic-obovate, about 2 mm. long and 0.9 mm. wide, obtuse or subacute at the apex, stramineous on the upper half, subhyaline toward the base, glabrous; staminate florets few, central: sepals 2, separate, subhyaline, obovate, about 1.3 mm. long and 0.6 mm. wide, apparently cucullate at the apex, not keeled, glabrous throughout; petals 2, linear-oblong, separate almost to the base, about 1 mm. long and 0.1 mm. wide, acute at the apex, glabrous, not glanduliferous; stamens 4, borne at the apex of a club-like stramineous 1-inch-long prolongation of the receptacle, the filaments divergent, about 0.2 mm. long; anthers black, about 0.3 mm. long, 2 often aborted; pistillate florets very numerous, peripheral, in many series: sepals 2, elliptic-falcate, stramineous or light-brown throughout, about 2.3 mm. long and 0.8 mm. wide, apiculate at the apex, glabrous throughout, very broadly keeled on the back, conduplicate; petals 2, 1 usually reduced, the outer developed and stramineous throughout, oblong, about 1.7 mm. long and 0.3 mm. wide, obtuse at the apex, with a small black gland at the center of the apex, glabrous throughout, the reduced one about 0.4 mm. long and 0.2 mm. wide and hyaline; style capillary, about 0.4 mm. long, glabrous; stigmas 2, 0.4-0.5

mm. long, erect; ovary black or dark-brown, globose, about 0.6 mm. long and wide, glabrous, 2-celled, 2-ovulate.

Type in herb. New York Botanical Garden, collected in swampy meadow south of Divina Pastora, Gran Sabana, between Divina Pastora on the Río Kukenán and Santa Elena, south of Mount Roraima, state of Bolívar, alt. 915-1005 m., October 3, 1944, *Julian A. Steyermark 59264.* The collector notes "leaves soft, rich green; heads white". The dried material, however, does not exhibit any whiteness on the heads.

Eriocaulon Steyermarkii Moldenke, sp. nov.

Herba; foliis caespitosis erectis vel divergentibus tenuibus 6-7 cm. longis longe attenuatis glabris basin versus plusminusve fenestratis; vaginis arcte adpressis 4-6 cm. longis pertenuis valde fenestratis glabris, ad apicem oblique fissis; pedunculis 1 vel 2, 18-20 cm. longis erectis stramineis 5-costatis glabris; capitulis albis hemisphaericis 8 mm. diam.; floribus dimeris.

Herb; stems much abbreviated; leaves cespitose, erect or spreading, thin-textured, 6-7 cm. long, about 3 mm. wide at the mid-point, long-attenuate, glabrous, more or less fenestrate toward the expanded base; sheaths 4-6 cm. long, very thin-textured, closely appressed to the peduncle, conspicuously fenestrate, glabrous, obliquely split at the apex, the blade attenuate-acute, erect, and closely appressed; peduncles 1 or 2 per plant, 18-20 cm. long, erect, stramineous, 5-costate, glabrous; heads white, hemispheric, about 8 mm. in diameter; involucral bractlets black, elliptic or elliptic-obovate, concave on the inner and convex on the outer surface, about 3 mm. long, 1.6-2 mm. wide, obtuse at the apex, more or less pilose-pubescent with short white hairs toward the apex on the outer surface, the hairs easily rubbed off; receptacle glabrous; receptacular bractlets obovate, blackish, about 2.5 mm. long and 1.5 mm. wide, acute at the apex, pilose on the back at the apex; staminate florets: sepals 2, blackish on the upper half, separate to the base, falcate-conduplicate, about 2.5 mm. long and 1 mm. wide, somewhat cucullate at the apex, pilose-pubescent toward the apex on the outer surface with erect white easily broken-off hairs; petals 2, unequal, connate into a slender glabrous hyaline tube for 1.5 mm., the free terminal part lingulate, one about 2 mm. long, the other 1 mm. long, both about 1 mm. wide and densely white-pilose on the back and bearded at the apex, each with a small black gland at the middle below the apex, widely divergent, subhyaline; stamens 4, 2 usually anantherous; filaments capillary, about 0.4 mm. long, glabrous, borne at the apex of the corolla-tube, adnate at base to the corolla; anthers black; pistillate florets: sepals 2, conduplicate, slightly falcate, oblanceolate, about 2.5 mm. long and 1 mm. wide, acute or apiculate at the apex, pilose-bearded at the apex on the outer surface; petals 2, equal, subhyaline, spatulate-obovate, about 2.5 mm. long and 1.5 mm. wide, separate practically to the short-clawed base, acute at

the apex, ciliate-margined and more or less pilose on the inner surface near the margins and apex, bearded at the apex, with a small black gland in the center near the apex; ovary very small; style very short; stigmas 2, erect-recurved.

Type in herb. New York Botanical Garden, collected in water of swamp on the summit of Mount Roraima, on southern half of the summit between Summit Camp, Great Central Rift, Central Swamp, and pond at southern end, state of Bolívar, alt. 2700-2740 m., September 28, 1944, *Julian A. Steyermark 58868.* The collector notes: "heads dull white; bracts dull blackish."

Leiothrix Steyermarkii Moldenke, sp. nov.

Herba perennis caulescens; caulibus usque ad 15 cm. longis, 1 cm. crassis, furcatis dense foliosis, ad apicem dense longeque villosis; foliis linearibus 4-5 cm. longis recurvato-patentibus ca. 1 mm. latis obtusis utrinque sparse pilosulis vel glabrescentibus; vaginis gracilibus arcte adpressis 4-6 cm. longis sparse pilosulis multistriatis tortis; pedunculis 1 vel paucis 35-46 cm. longis glabris 3-costatis tortis, ad apicem adpresso-pilosis.

Caulescent perennial herb, growing in dense tufts; stems to about 15 cm. long, about 1 cm. thick, usually only once forked near the base, very densely leafy and entirely hidden by the sheathing and closely imbricate leaf-bases, densely long-pilose with white villous hairs at the apex; leaves pale green, very numerous, linear, 4-5 cm. long, recurved-spreading, about 1 mm. wide, blunt, sparsely and irregularly pilosulous on both surfaces or glabrescent, thin-textured but not fenestrate, the midrib rather prominulous beneath, the margins sometimes slightly revolute; sheaths very slender, closely appressed to the peduncles, usually slightly surpassing the leaves, 4-6 cm. long, rather sparsely pilosulous with simple whitish or capitate gland-tipped rather spreading hairs, many-striate, somewhat twisted, the apex obliquely split, the blades lanceolate-lingulate, appressed-pilosulous and often somewhat ciliate, about 5 mm. long, erect, blunt; peduncles slender, 1 or a few at the apex of each branch, 35-46 cm. long, glabrous or practically so, 3-costate, twisted, more or less appressed-pilose just beneath the head; heads hemispheric, 7-8 mm. wide, creamy-white; involucral bractlets light-stramineous or buff, oblanceolate, usually very concave on the inner and convex on the outer surface, about 2.5 mm. long and 1.5 mm. wide, readily splitting at the very abruptly rounded apex, glabrous throughout, shiny; receptacle densely long-pilose; receptacular bractlets none; staminate florets: sepals 3, separate almost to the base, hyaline, narrowly elliptic-falcate, 2.3-2.6 mm. long, about 0.6 mm. wide, more or less conduplicate-navicular, glabrous throughout, not bearded, not glanduliferous; petals 3, united into a slender tube about 1.5 mm. long, glabrous, stramineous, the free terminal lobes hyaline, about 0.6 mm. long, involute, glabrous, not glanduliferous; stamens 3, included; anthers white; pistillate florets: sepals 3, separate practi-

cally to the base, hyaline, elliptic-falcate, more or less navicular, 2.6-2.8 mm. long, about 0.6 mm. wide, acute, rather densely appressed-pilose on the back, not bearded, not glanduliferous; petals 3, separate to the base, narrow-elliptic, hyaline, about 1.8 mm. long, long-attenuate at the apex, the attenuate subcaudate apex involute, glabrous throughout, not bearded, not glanduliferous; style about 0.5 mm. long, glabrous; ovary oblong, 3-celled, about 0.4 mm. long; style-appendages 3, about 1 mm. long, erect, arising from a lower level than the 3 much shorter papillose stigmas.

Type in herb. New York Botanical Garden, collected in *Brocchinia-Stegolepis-Heliamphora* swamp, on southwest-facing shoulder of Ptari-tepuí, state of Bolívar, alt. 2200 m., November 2, 1944, *Julian A. Steyermark 59779.* This handsome species does not closely resemble any other species of this genus from northern South America.

Leiothrix umbratilis Moldenke, sp. nov.

Herba; caulibus valde abbreviatis; foliis rosulatis rectis 19-22 cm. longis, 10-13 mm. latis utrinque plusminusve pilosis obtusis, in statu senectute glabrescentibus; vaginis laxis 14-15 cm. longis dense patenteque villosis, laminis irregulariter lobatis; pedunculis 7-10, 35-40 cm. longis, sparse pilosulis dein glabrescentibus, ad apicem persistenter patento-puberulis, 2-costatis compressis tortis.

Herb; stems greatly abbreviated; leaves all basal, cespitose, erect, thin-chartaceous, grass-green, 19-22 cm. long, 10-13 mm. wide at the mid-point, rather firm-textured, not fenestrate, more or less pilose on both surfaces, glabrescent in age, blunt at apex; sheath slightly shorter than the leaves, cylindric, rather loose, 14-15 cm. long, densely spreading-villous, obliquely split at the apex, the blade elongate, erect, usually about 2 cm. long, more or less appressed to the peduncle, irregularly lobed at the apex; peduncles 7-10 per plant, 35-40 cm. long, very sparsely pilosulous when young, soon glabrescent except for the very apex which is persistently spreading-puberulent, 2-costate, flattened, twisted; heads hemispheric, about 1 cm. wide, white, very hairy; involucral bractlets stramineous, densely imbricate, in many series, variable in shape, oblong or oblanceolate or elliptic, about 4 mm. long, blunt, about 1 mm. wide, more or less sparsely pilose on the back, more densely so on the margins and at the apex; receptacle densely long-villous; receptacular bractlets hyaline, spatulate, about 5 mm. long and 1 mm. wide, obtuse, very sparsely pilose near the margins and apex; staminate florets pedicellate: sepals 3, hyaline, narrow-elliptic, 2.1-2.3 mm. long, about 0.6 mm. wide, subacute, glabrous throughout or very sparsely pilosulous at the apex, not bearded, not glanduliferous; petals 3, hyaline, united into a slender tube about 2.1 mm. long, glabrous, the free lobes narrow-oblong, hyaline, erect, about 2.1 mm. long, glabrous, not bearded, not glanduliferous, somewhat involute at the apex; stamens 3, included; filaments about 0.4 mm. long;

pistillate florets pedicellate: sepals 3, separate to the base, hyaline, elliptic, erect, about 3 mm. long and 0.8 mm. wide, usually navicular, subacute, ciliate-margined toward and at the apex; petals 3, separate to the base, hyaline, erect, narrowly elliptic or oblong, about 1.7 mm. long and 0.4 mm. wide, ciliate-margined toward and at the apex; style about 1.4 mm. long, glabrous, with 3 slender erect appendages issuing at about 1/3 its height, 1 mm. long; stigmas 3, terminal, very small, about 0.2 mm. long; ovary 3-lobed, 3-celled, glabrous, but surrounded by a tuft of very long erect villous hairs issuing from the receptacle within the perianth.

Type in herb. New York Botanical Garden, collected in shaded places at the edge of a forest in scrubby *Stegolepis*-shrub growth on mesa between Ptari-tepuí and Sororopán-tepuí, in vicinity of "Misia Kathy Camp", state of Bolívar, alt. 1615 m., November 15-17, 1944, *Julian A. Steyermark 60280.* The species is obviously related to *L. flavescens* (Bong.) Ruhl., but differs in its longer and broader leaves, the peduncles not surpassing the leaves, and in floral characters.

Paepalanthus perplexans Moldenke, sp. nov.

Herba caulescens; caulibus elongatis ca. 30 cm. longis gracilibus valde foliosis furcatis; foliis lanceolatis 3.5-4 cm. longis, ca. 1 cm. latis, firme membranaceis multistriatis patentibus acutis utrinque irregulariter albido-pilosis dein punctulato-puberulis; vaginis anguste cylindricis ca. 5 cm. longis sparse irregulariterque pubescentibus vel pilosulis, ad apicem dense villosis ciliatisque; pedunculis gracilibus usque ad 30 cm. longis 3-costatis non tortis sparse irregulariterque pilosulis.

Caulescent herb; stems elongate, about 30 cm. long, slender, very leafy, branched; leaves sheathing, the bases closely imbricate, lanceolate, 3.5-4 cm. long, about 1 cm. wide at the base, firmly membranous, rich grass-green on both surfaces, many-striate, not fenestrate, spreading, acute at the apex, the base scarious-margined (the opaque portion of the blade uniformly 5 mm. wide to the base, the scarious margin becoming regularly narrower from the base to about 1.5-2 cm. above the base), both surfaces more or less irregularly whitish long-pilose, less so or only punctulate-puberulent in age, the scarious margins more or less long-ciliate; inflorescences about 4 per branch per season, but those of the previous season usually persisting in blackened form lower down the branches; sheaths narrow-cylindric, surpassing the leaves, about 5 cm. long, sparsely and irregularly short-pubescent or pilosulous, its apex obliquely split, densely villous and ciliate, the blade lanceolate and acute, erect; peduncles slender, to about 30 cm. long, sparsely and irregularly pilosulous, 3-costate, not twisted; heads hemispheric, 5-7 mm. wide; involucral bractlets in many closely imbricate series, ovate, 2-2.5 mm. long, 1-1.5 mm. wide at the base, dark-brown, shiny, acute at the apex, glabrous except for the ciliolate margins; receptacle long-vil-

lous; receptacular bractlets spatulate, about 2 mm. long, about 0.8 mm. wide at the widest point, brown on the upper 1/3, stramineous on the lower 2/3, densely bearded at and just below the apex on the back, the remainder glabrous on both surfaces; staminate florets apparently of 2 types: the fertile type with 3 sepals, separate practically to the base, oblanceolate, about 1.7 mm. long, 0.4-0.6 mm. wide at the widest point, navicular, dark-brown, rounded and densely bearded on the back at the apex, otherwise glabrous and shiny; petals 3, deep-brown, about 1.3 mm. long, united for 1/2 their length into a narrow tube, glabrous throughout, the free lobes oblong, involute at the apex; stamens 3, filaments brown, about 0.6 mm. long, glabrous; anthers brown, elliptic-oblong, about 0.6 mm. long; the sterile type with 3 obovate-elliptic sepals separate practically to the base, about 1.7 mm. long and 0.8 mm. wide, brownish, long-pilose throughout on the outer surface, densely bearded at the rounded apex; petals 3, united into a slender tube about 1.6 mm. long, the free lobes about 0.6 mm. long, narrow-lanceolate, recurved, thin; filaments 3, erect, heavy, subspatulate, anantherous; pistillate florets not observed.

Type in herb. New York Botanical Garden, collected in *Bonnetia roraimae* forest on the southwest-facing shoulder of Ptari-tepuí, state of Bolívar, alt. 2000-2200 m., November 2, 1944, *Julian A. Steyermark 59748*. This puzzling species resembles *P. Killipii* Moldenke in general habit and appearance. The collector describes the plant as having "scapes pale green below, pale salmon above; bracts brownish; heads white with blackish." It is most remarkable in exhibiting no pistillate florets in the several heads examined, but having apparently two types of morphologically staminate florets instead, one type fertile and the other type anantherous. The species is probably either dioecious or polygamo-dioecious.

Paepalanthus roraimensis Moldenke, sp. nov.

Herba caulescens; caulibus elongatis 50 cm. longis dense filiosis, ad apicem dense longeque villosis dein glabrescentibus; foliis subcoriaceis lanceolatis patentibus ca. 6 cm. longis, 1.3-1.4 cm. latis, utrinque glabris vel sparsissime pilosis, ad basin longe villosis multistriatis non fenestratis attenuato-acutis; vaginis anguste cylindricis ca. 6.5 cm. longis arcte adpressis multistriatis non tortis sparsissime pilosis; pedunculis ca. 30, 15-20 cm. longis 5-7-costatis sparse pilosulis vel glabrescentibus tortulis.

Caulescent herb; stems elongated, 50 cm. long or longer, densely leafy, completely hidden by the leaves except at the base, 5-6 mm. wide, densely long-villous at the apex, glabrous in age; leaves dull-green, subcoriaceous, spreading, lanceolate, about 6 cm. long, 1.3-1.4 cm. wide near the base, clasping the stem at base, glabrous or very sparsely pilose on both surfaces except at the long-villous base, completely glabrous and shiny when mature (except for the base), many-striate, not fenestrate, attenuate to the acute apex; sheaths about equaling the upper leaves, about 6.5 cm. long, narrow-

cylindric, closely appressed to the peduncles, many-striate, not twisted, very sparsely pilose, obliquely split at the apex, the blade about 1.5 cm. long, lanceolate, erect, appressed, sparsely and irregulraly ciliate, apiculate at the apex; peduncles numerous, about 30 per plant, 15-20 cm. long, sparsely pilosulous or glabrescent, 5-7-costate, slightly twisted; heads hemispheric, about 1 cm. in diameter, gray; involucral bractlets blackish toward the apex, paler toward the base, numerous, closely imbricate, broadly ovate, about 2.5 mm. long and wide, acute or subapiculate at the apex, glabrous, shiny; receptacle very sparsely and obscurely long-villous or glabrescent; receptacular bractlets narrowly oblong, 2.6-2.8 mm. long, about 0.5 mm. wide, black at the apex, brown below, hyaline at the base, villous on the back toward the apex, densely bearded at the apex; staminate florets: sepals 3, connate at the base, the free portions elliptic, about 1.9 mm. long and 0.6 mm. wide, obtuse, short-villous toward and at the apex on the back; petals 3, connate into a hyaline tube about 1 mm. long, glabrous, ampliate at the apex into a cupuliform rim which is about 0.6 mm. in height and 1 mm. in diameter, hyaline, glabrous, and 3-toothed, the teeth ovate, about 0.4 mm. long or less, often more or less ciliolate between the teeth; stamens 3, opposite the petal-teeth, inserted at the apex of the corolla-tube; filaments about 0.6 mm. long, glabrous; anthers white, versatile, each of the 2 separate thecae about 0.4 mm. long, opening by longitudinal slits; 3 rudimentary style-appendages inserted at the apex of the corolla-tube, about 0.4 mm. long, papillose; pistillate florets: sepals 3, connate only at the very base, elliptic, dark-brown toward the apex, hyaline at the base, about 2.1 mm. long and 0.8 mm. wide, more or less navicular, appressed-villous on the back, densely bearded at the apex; petals 3, hyaline, separate, narrowly oblong-elliptic, about 2.1 mm. long and 0.4 mm. wide, acute, very densely long-villous on the back with erect or spreading hairs equaling or slightly surpassing the petals, not bearded, not glanduliferous; style about 0.8 mm. long, glabrous, terminated by 3 erect stigmas and 3 erect style-appendages, all about 0.6 mm. long; ovary subglobose, about 0.4 mm. long and wide, glabrous, 3-lobed, 3-celled.

Type in herb. New York Botanical Garden, collected below waterfall spray among boulders or talus, on ascent of ledge along southwest-facing side, from beginning of sandstone bluffs to summit, Mount Roraima, state of Bolívar, alt. 2255-2620 m., September 27, 1944, *Julian A. Steyermark 58768.*

Paepalanthus scopulorum Moldenke, sp. nov.

Herba caulescens; caulibus gracilibus elongatis furcatis foliosis; foliis duris firmis elongato-lanceolatis 2.5-4 cm. longis 3-7 mm. latis acutis multistriatis non fenestratis patentibus, in senectute subfalcato-conduplicatis, supra in statu juventute dense albido-villosis dein glabrescentibus, subtus obscure subadpresso-pilosis; vaginis cylindricis laxiusculis 1.5-2 cm. longis densiuscule breviterque pubescentibus, ad apicem longe ciliatis; pedunculis gracilibus, 5-15,

6-7 cm. longis, 4- vel 5-costatis, tortis, dense breviterque pubescentibus dein praeter apicem glabrescentibus.

Caulescent herb; stems slender, to about 10 cm. long, branched, very leafy; leaves firm and tough, elongate lanceolate, somewhat twisted or falcate-conduplicate in age, 2.5-4 cm. long, 3-7 mm. wide at the mid-point, acute at the apex, many-striate, not fenestrate, spreading, sheathing the stem at the base, densely white-villous with tangled white hair when young on the upper surface, glabrescent in age, obscurely subappressed-pilose on the lower surface (densely so when very young, sparsely so in age); sheaths cylindric, rather loose, about equaling the uppermost leaves, 1.5-2 cm. long, rather densely short-pubescent with appressed antrorse hairs, less so in age, obliquely split at the apex, the blade lanceolate, erect or the tip spreading or recurved, 5-7 mm. long, more or less long-ciliate on the margins; peduncles slender, 5-15 per plant, 6-7 cm. long, 4- or 5-costate, twisted, densely short-pubescent with subappressed antrorse hairs, glabrescent in age except for the very tip; heads hemispheric, 6-7 mm. in diameter; involucral bractlets broadly triangular-ovate, dark-brown, about 2 mm. long, about 1.5 mm. wide at the base, short-acuminate at the apex, ciliolate-margined, otherwise glabrous; receptacle densely long-villous; receptacular bractlets absent; staminate florets: sepals 3, separate to the base, firm, erect, brownish, darkest toward the apex, oblanceolate, about 1.4 mm. long and 0.5 mm. wide, acute, the margins more or less involute, densely bearded at the apex on the back, otherwise glabrous, not glanduliferous; petals 3, united into a hyaline infundibular tube about 1.7 mm. long, glabrous, narrow-cylindric for about the lower half of its length, abruptly ampliate to 0.8 mm. at the apex, its rim 3-apiculate; stamens 3, opposite the corolla-apiculations, inserted on the corolla-tube about 0.4 mm. below its apex; filaments slender, about 0.4 mm. long, glabrous, equaling the corolla-apiculations; anthers white, versatile, oblong, about 0.3 mm. long, composed of 2 separate thecae, each dehiscing by means of a longitudinal slit; style about 1.3 mm. long, the upper 0.4 mm. trifid; ovary absent; pistillate florets few: sepals 3, lingulate, firm, erect, about 1.2 mm. long, rather uniformly about 0.6 mm. wide throughout, obtuse at the apex, light-brown toward the apex and in a median band to the base, hyaline-margined toward the base, more or less densely long-villous on the back and short-bearded at the apex, or only densely bearded, not glanduliferous; petals 3, separate almost to the base, subhyaline, erect, elliptic-oblong, about 1.3 mm. long and 0.4 mm. wide, subacute at apex, glabrous on the back, very densely long-villous on the inner surface with white hairs surpassing the petals in length, not bearded, not glanduliferous; style about 0.6 mm. long, glabrous, terminated by 3 clavate style-appendages and 3 bifid stigmas, all 0.4-0.5 mm. long; ovary small, subglobose, about 0.4 mm. long and wide, glabrous, 3-celled.

Type in herb. New York Botanical Garden, collected in dense

colonies and masses on wet bluffs, along base of south-facing sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2410 m., November 6, 1944, *Julian A. Steyermark 59914.* The collector notes that it is one of the commonest species on the bluffs. It resembles *P. Killipii* Moldenke, from Colombia, in habit, but is abundantly distinct in characters of the leaves, peduncles, and flowers.

Paepalanthus squamiliferus Moldenke, sp. nov.

Herba caulescens; caulibus usque ad 9 cm. longis dense foliosis; foliis firme membranaceis erecto-patentibus 3.5-4 cm. longis, 2.5-4 mm. latis, acutis multistriatis non fenestratis utrinque glabris; vaginis anguste cylindricis adpressis tortis ca. 6 cm. longis multistriatis glabris, apice piloso-ciliato; pedunculis solitariis usque ad 40 cm. longis 5-costatis, parce pilosis, pilis irregulariter patentibus vel reflexis.

Caulescent herb; stems to about 9 cm. long, very leafy, completely hidden by the leaf-bases; leaves firmly membranous, grass-green, erect-spreading, grass-like, 3.5-4 cm. long, 2.5-4 mm. wide at the mid-point, acute, many-striate, not fenestrate, glabrous on both surfaces; sheath greatly surpassing the leaves, narrowly cylindric, appressed to the peduncles, twisted, about 6 cm. long, many-striate, glabrous except for the more or less pilose-ciliate apex, obliquely split at the apex, the blade erect, closely appressed, ovate, 0.5-1.5 cm. long, ciliate-margined when young, glabrous in age; peduncles solitary at the apex of each stem, to about 40 cm. long, sparsely pilose with irregularly spreading or retrorse white hairs, 5-costate; heads hemispheric or almost spherical, about 1.5 cm. in diameter, gray; involucral bractlets variable in size and shape, the outermost very dark brown or blackish, broadly elliptic, about 4.5 mm. long and 3 mm. wide, the inner ones oblong, slightly wider near the apex, dark-brownish, lighter toward the margins, about 4 mm. long and 1.5 mm. wide, acute at the apex, all rather sparsely long-villous in a central band on the back with more or less appressed antrorse hairs; receptacle long-villous; receptacular bractlets oblong or elliptic, about 3.4 mm. long and 0.8 mm. wide, usually more or less conduplicate-navicular, acute, long-villous in a median band on the back; staminate florets: sepals 3, connate only at the very base, erect, light-brownish, elliptic, about 3.5 mm. long and 1 mm. wide, obtuse at the apex, densely villous toward the apex on the back, not bearded, not glanduliferous; petals 3, connate into a slender tube about 4 mm. long, glabrous, not ampliate above, the separate lobes narrowly oblong, erect, 3-3.5 mm. long and 0.5 mm. wide, short-bearded at the apex, not involute, not glanduliferous; stamens 3, inserted at the mouth of the corolla-tube; filaments about 2.5 mm. long, black, glabrous; anthers not seen; pistillate florets: sepals 3, separate to the base, brown, broadly elliptic, about 3.4 mm. long and 1.9 mm. wide, acute, brownish, long-villous in a median band on the back, the margins lighter and usually conduplicate, not bearded, subtending a great mass of long, erect, villous hair; petals 3, separate to the base,

linear-lanceolate, 2.1-2.8 mm. long, about 0.3 mm. wide, more or less attenuate to the sharply acute apex, very densely long-villous on the back with wide-spreading hairs that far exceed the petals; style about 1 mm. long, glabrous, terminated by 3 erect flat style-appendages about 1 mm. long and 3 erect simple or bifid stigmas 1.9-2 mm. long; ovary small, with 3 erect scales about 0.3 mm. long at its base.

Type in herb. New York Botanical Garden, collected in *Brocchinia-Stegolepis-Heliamphora* swamp on southwest-facing shoulder of Ptaritepuí, state of Bolívar, alt. 2200 m., November 2, 1944, *Julian A. Steyermark 59777*. The species is most remarkable because of the 3 erect scales subtending the base of the ovary. Apparently these represent the very much reduced corollas.

Paepalanthus Steyermarkii Moldenke, sp. nov.

Herba pumila; caulibus valde gracilibus 1-2 cm. longis foliosis plerumque furcatis; foliis numerosis linearibus 5-10 mm. longis subrectis vel recurvato-patentibus, 0.5-1 mm. latis obtusis utrinque densiuscule albido-pilosis; vaginis gracile cylindricis arcte adpressis ca. 1 cm. longis dense albido-pilosis pedunculis paucis 2.5-3.5 cm. longis densiuscule albido-pilosis 3-costatis non tortis.

Dwarf herb; stems very slender, 1-2 cm. long, leafy, often branched; leaves numerous, usually densely clustered at the apex of the stems or branches, 5-10 mm. long, linear above the sheathing base, suberect or recurved-spreading, 0.5-1 mm. wide, blunt, gray-green, not fenestrate, rather densely white-pilose on both surfaces; sheath slender-cylindric, closely appressed to the peduncle, equaling the leaves, about 1 cm. long, densely white-pilose like the leaves, obliquely split at the apex, the blade linear, spreading, about 4 mm. long, blunt, white-pilose; peduncles slender, 1 or several per branch, 2.5-3.5 cm. long, rather densely white-pilose with spreading or (more rarely) appressed hairs, 3-costate, not twisted; heads hemispheric, about 5 mm. in diameter, gray-white; involucral bractlets oblanceolate, 1.7-1.9 mm. long, about 0.8 mm. wide, light-brownish in a median band almost to the apex, translucent along the margins and at the apex, acute at the apex, glabrous throughout; receptacle long-pilose; receptacular bractlets oblanceolate, about 1 mm. long and 0.5 mm. wide, very light-stramineous, obtuse at the apex, glabrous except for the densely bearded apex; staminate florets: sepals 3, separate practically to the base, oblanceolate, about 1.1 mm. long and 0.4 mm. wide, light-brownish or stramineous, obtuse, glabrous except for the densely bearded apex, not glanduliferous; petals 3, united into a slender glabrous subhyaline tube about 0.8-1 mm. long, the free terminal lobes about 0.3 mm. long, subhyaline or stramineous, erect, glabrous, involute at the apex, not glanduliferous; stamens 3, about equaling the petals; pistillate florets: sepals 3, separate practically to the base, elongate-oblong, about 1.8 mm. long and 0.4 mm. wide, attenuate to an acute apex, light-stramineous or trans-

lucent, glabrous throughout, not bearded, not glanduliferous; petals 3, separate, elliptic-sublanceolate, hyaline, about 1.2 mm. long and 0.3 mm. wide, subacute, glabrous throughout, not glanduliferous; ovary 3-celled, oblong-elliptic, about 0.7 mm. long and 0.4 mm. wide, glabrous, 3-ovulate; style stout, about 0.4 mm. long, glabrous; stigmas 3; style-appendages 3, issuing from the same level as the stigmas.

Type in herb. New York Botanical Garden, collected in sandy wet ground with *Stegolepis* and *Brocchinia* on large mesa, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest of Río Karuai, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59369*. The species is apparently closely related to *P. cristatus* Moldenke, which differs in its blunt brunneous involucral bractlets, larger receptacular bractlets which are long-villous over the entire back, larger cuneate sepals in the staminate florets, smaller and bearded sepals and bearded petals in the pistillate florets, the glabrescent leaves and peduncles, and other characters.

Rondonanthus micropetalus Moldenke, sp. nov.

Herba dense caespitosa; caulibus valde abbreviatis dense villosis; foliis numerosis firmis rectis vel patentibus lanceolatis 2-4 cm. longis, 2-4 mm. latis, acutis vel attenuatis, in statu juventute utrinque sparse longeque pilosis, dein glabrescentibus, obscure multistriatis non fenestratis nitidis, ad basin dense villosis; vaginis cylindricis, ad basin inflatis, ad apicem arcte adpressis, ca. 1.4 cm. longis, multistriatis non tortis glabris, ad apicem ciliatis; pedunculis paucis abbreviatis 2-3 cm. longis non tortis sulcatis obscure puberulis nitidis, ad apicem ampliatis.

Densely tufted herbs; stems much abbreviated, densely villous, hidden by the leaves; leaves numerous, in dense rosettes, rather firm, erect or spreading, lanceolate, 2-4 cm. long, 2-4 mm. wide at the mid-point, acute or attenuate at the apex, sparsely long-pilose on both surfaces when young, glabrescent in age, rather obscurely many-striate, not fenestrate, shiny, ampliate and clasping the stem at the base and usually densely villous there; sheath cylindric, somewhat inflated toward the base, closely appressed to the peduncle at the apex, about 1.4 cm. long, many-striate, not twisted, glabrous except for the apex, obliquely split at the apex, the blade lanceolate, about 5 mm. long, erect, appressed to the peduncle, acute, ciliate-margined; peduncles few, all abbreviated, 2-3 cm. long, not twisted, several-sulcate, very obscurely puberulent in the sulcations, otherwise glabrous, shiny, brownish, ampliate at the apex; heads hemispheric, 3-9 cm. in diameter, white; plants apparently dioecious, only staminate florets seen; involucral bractlets broadly ovate, blackish, closely imbricate, about 2.5 mm. long and 3 mm. wide, more or less acuminate at the apex, glabrous and shiny except for the more or less ciliate margins toward the apex; receptacle long-villous; receptacular bractlets oblong-elliptic, blackish toward the

apex, lighter or even subhyaline toward the base, closely appressed to the staminate florets, 1.5-2.1 mm. long, 0.4-0.6 mm. wide, obtuse at the apex, densely villous on the back from about the middle to the apex and on the margins often to the base, densely bearded at the apex, or glabrous except for the bearded apex; staminate florets: sepals 3, separate to the base, subhyaline or stramineous, narrowly elliptic-oblanceolate, sometimes brownish toward the apex, 0.7-1.5 mm. long, 0.2-0.4 mm. wide, acute at the apex, densely bearded at and near the apex; petals 3, reduced to tiny suborbicular scales about 0.2 mm. long or less, hyaline, separate to the base, opposite the filaments and barely reaching the base of the anthers, appressed; stamens 3, tiny erect, included; filaments about 0.3 mm. long, glabrous; anthers oblong, white, about 0.3 mm. long, dorsifixed, composed of 2 parallel more or less versatile thecae, each opening by longitudinal slits; among the staminate florets are similar ones with more or less effete anthers, but otherwise identical; pistillate florets not seen.

Type in herb. New York Botanical Garden, collected on ascent of ledge along southwest-facing side of Mount Roraima, from beginning of sandstone bluffs to summit, state of Bolívar, alt. 2255-2620 m., September 27, 1944, *Julian A. Steyermark 58777.* In the absence of pistillate florets the generic position of this curious species is uncertain. It is placed tentatively in *Rondonanthus* because of its separate petals in the staminate florets and its apparently dioecious habit. It differs pronouncedly from the only other known species of the genus, *R. roraimae* (Oliv.) Herzog, which has the petals of the staminate florets as long as the sepals and very different involucres. It may possibly represent an undescribed genus.

Syngonanthus duidae Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis recurvis usque ad 1 cm. longis non fenestratis glabratis, ca. 0.5 mm. latis, obtusis; vaginis arcte adpressis ca. 1.5 cm. longis glabris, apice ciliato; pedunculis solitariis gracillimis 8-15 cm. longis 3-costatis tortis basin versus breviter pilosis, apicem versus glabris.

Acaulescent herb, or with extremely abbreviated stems; leaves basal, rosulate, recurved, firm-textured, dull-green, tinted with brick-red or brown, 1 cm. long or less, not fenestrate, the venation indiscernible, essentially glabrous, 0.5 mm. wide or less, blunt at the apex; sheaths surpassing the leaves, closely appressed to the peduncles, about 1.5 cm. long, essentially glabrous except for the ciliate apex, obliquely split at the apex; peduncles solitary, very slender, 8-15 cm. long, lightly 3-costate, twisted, short-pilose on the lower half, glabrous above; heads hemispheric, 3.5-6 mm. in diameter, white; involucral bractlets lanceolate, about 3.2 mm. long, about 0.6 mm. wide at the base, regularly attenuate to the sharply subacuminate apex, stramineous or white, glabrous throughout; receptacle densely white-pilose with rather long hairs; receptacular bractlets oblong or

oblong-lanceolate, hyaline, about 2.8 mm. long, about 0.4 mm. wide at the base, subacute at the apex, slightly appressed-short-pilose on the back or glabrate, not bearded; staminate florets: sepals 3, separate practically to the base, narrow-lanceolate, about 2.8 mm. long, about 0.3 mm. wide at the base, attenuate to the subacute apex, sparsely pilose on the back toward the base, not bearded, not glanduliferous; petals 3, connate into a hyaline tube about 1.4 mm. long and 0.5 mm. wide, glabrous, 3-lobed and involute at the apex, not glanduliferous; stamens 3; anthers white, oblong, about 0.2 mm. long; pistillate florets: sepals 3, separate to the base, narrowly elliptic-lanceolate, about 3 mm. long, about 0.4 mm. wide, attenuate to the sharply acute apex, rather sparsely or densely pilose on the back and margins, not bearded, not glanduliferous; petals 3, connate at the middle, hyaline, narrow-ellitpic, about 2.2 mm. long and 0.5 mm. wide, acute, somewhat pilose on the back, not bearded, not glanduliferous; style short, stout, about 0.4 mm. long, glabrous; stigmas 3, about 0.3 mm. long, densely papillose; style-appendages 3, elongate to 1 mm., glabrous, epapillose, arising from the same place as the stigmas; ovary ovate, about 0.5 mm. long, glabrous, 3-celled, 3-ovulate.

Type in herb. New York Botanical Garden, collected around a small stream on dry rocky slopes, summit of Cerro Duida, Brocchinia Hills, Territorio Federal Amazonas, alt. 1700-1980 m., September 1, 1944, *Julian A. Steyermark 58199.*

Syngonanthus venezuelensis Moldenke, sp. nov.

Herba perenna pumila caulescens; caulibus usque ad 3 cm. longis gracilibus brachiatis dense foliosis procumbentibus vel adscendentibus, ad apicem plusminusve longe pilosis; foliis firmis linearibus 5-7 mm. longis non fenestratis obtusis parcioscule pilosis in statu senectute glabrescentibus; vaginis gracilibus arcte adpressis ca. 7 mm. longis parce pilosulis glabrescentibus; pedunculis gracilibus solitariis ca. 1 cm. longis 2-costatis non tortis glabris.

Dwarf caulescent perennial, forming dense mats; stems about 3 cm. long, slender, several-branched, densely leafy, procumbent or ascending, more or less long-pilose with soft white hairs on the younger parts; leaves firm, gray-green on both surfaces, linear except for the sheathing base, spreading or recurved, 5-7 mm. long, less than 1 mm. wide, not fenestrate, rounded at apex, rather sparsely and loosely pilosulous on both surfaces, glabrescent in age, the hairs very short, white, appressed; sheaths slender, closely appressed to the peduncles, about 7 mm. long, subequaling the leaves, sparsely pilosulous like the leaves, glabrescent in age, obliquely split and more or less ciliolate at the apex, the blade about 2 mm. long, narrow-lanceolate, erect, blunt; peduncles slender, about 1 cm. long, glabrous (or minutely pilosulous with appressed hairs at the apex), 2-costate, not twisted, usually one per branch; heads hemispheric, about 5 mm. in diamtere; involucral bractlets stramineous, usually

darker brown in the central portion, obovate-oblanceolate, about 1.5 mm. long and 0.8 mm. wide, acute at apex, the margins at and above the widest part subhyaline, glabrous and shiny throughout; receptacle long-pilose; receptacular bractlets oblong-oblanceolate or oblong, 1.3-1.7 mm. long, 0.4-0.6 mm. wide, stramineous in a median band, hyaline-margined, often with the margins conduplicate, densely bearded at the apex on the back, otherwise glabrous; staminate florets: sepals 3, separate almost to the base, brunneous, elliptic-obovate or obovate, about 1 mm. long, about 0.4 mm. wide, subacute or obtuse, glabrous throughout, not glanduliferous; petals 3, united into a slender tube about 0.8 mm. long, glabrous, the free lobes about 0.3 mm. long, involute, glabrous, not glanduliferous; stamens 3, included; pistillate florets: sepals 3, separate almost to the base, hyaline, narrowly oblong or oblanceolate, 0.8-1.3 mm. long, about 0.2 mm. wide, acute at apex, glabrous throughout, the free apical lobes quite short, hyaline, incurved, glabrous, not glanduliferous; style stramineous, about 0.5 mm. long; stigmas 3; ovary oblong, 3-celled.

Type in herb. New York Botanical Garden, collected in sandy wet meadow on large mesa, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59347.* Superficially this peculiar species greatly resembles some of the very dwarf matted species of *Paepalanthus.*

RAPATEACEAE

Rapatea Steyermarkii Maguire, sp. nov.

Herbae terrestres perennantes. Caudex adscendens erectusve, 10-20 cm. longus. Folia 8-10, 50-65 cm. longa; vaginis equitantibus distichisque, in dispositione paullum helicoideis, 12-15 cm. longis, 1.5-3.5 cm. e costa ad marginem, 10-15-nervatis, vix brevi-castaneo-strigosis, scarioso marginatis, paullatim arctatis in petiolum alatum ca. 1 cm. longum; laminis 40-50 cm. longis 5-7 cm. latis, supra tenuiter celluloso-punctatis, infra similiter punctatis atque conspicue glanduloso-papillatis, 70-80-nervatis, e costa prominenti nervis lateralibus valde adscendentibus, apice falcato-acuminato, basi inaequilaterali, abrupte constricto. Pedunculi solitarii vel pauci, 3-5 cm. longi, ca. 1.5 cm. lati, in maturitate valde recurvati; involucri bracteis 2, late cordatis ca. 5 cm. latis ad basim, 6-7 cm. longis, ad apicem abrupte caudatis; receptaculi bracteis scariosis 12-18 mm. longis utrinque pubescentibus uninervatis; pedicellis ca. 1 cm. longis 2 mm. crassis paullum compressis castaneo-pubescentibus; spiculis ca. 2 cm. longis sepalis expansis exclusis; bracteolis 9-11, paullum gradatis, exterioribus 12-13 mm. longis 5 cm. latis, interioribus 17-20 cm. longis, 3.5-4.0 mm. latis, acutis brevipungentibus, apiculo ca. 1 mm. longo, corpore trinervato, utrinque pubescentibus. Perianthium non visum; ovario triloculari, ovulo uno in loculo. Capsula 7-8 mm. longa, basi subscarioso, sursum indurata; semine 5 mm. longo, cylindrico-oblongo, griseo-brunneo striato, hilo basilari obliquo, concavo.

Type in herb. Chi. Nat. Hist. Mus., collected in shaded wet woods of a dwarf type, lower southeastern slopes of Carrao-tepuí, state of Bolívar, alt. 1675-1980 m., Dec. 5-6, 1944, *Julian A. Steyermark 60868*, "leaves arising at base from an elongated caudex or old stem several inches to a foot from the ground, then the leaf bases or sheaths themselves in a fan-like arrangement, but the blades in a spiral or several-ranked arrangement, not in a single rank as in *Stegolepis*; leaves firmly membranaceous, dull green above, silvery green-papillate below."

Rapatea Steyermarkii is most closely related to *R. Ulei* Ducke, which it strikingly resembles superficially. Aside from its distinct geographic and ecologic isolation, our plant is at once recognized by its short peduncle, smaller head, and much larger spikelets, and by the conspicuously glandular-papillate leaves, noted in the field by the collector.

Stegolepis Gleasoniana Steyermark, sp. nov.

Foliorum vaginae conduplicatae ovatae, apice rotundatae vel obtusae, nitentes membranaceae, nervis manifestis; laminis crassis coriaceis rigidis late linearibus erectis, subtus pallido-viridibus, 90-95 cm. longis, 8-22 mm. latis, in parte media latissimis, ad extremos angustatis, inaequilateris, apice acuminatis, uno latere costa

media prominenti incrassata, 7-10 nervis uno latere, 10-12 nervis alio latere; scapis elongatis tenuissimis, 40-45 cm. longis, 1 mm. crassis, glabris, paucisulcato-striatis, apice paullo dilatatis; involucro nullo nisi bracteis 3 infimis quam vicinis multo longioribus; floribus 1 vel 2 infrequente 4; bracteis brunneis, extimis 3 vel 4 membranaceis majoribus inaequalibus anguste lanceolatis longe acuminatis, 14-18 mm. longis, 3 mm. latis, intermediis 11 brevioribus anguste lanceolatis, longe acuminatis (exterioribus) vel late lanceolatis vel ovatis, breve- vel longe-acuminatis (interioribus), 6.5-7 mm. longis, 2.5-3 mm. latis (interioribus) ad 8-9 mm. longis, 2-3 mm. latis (exterioribus); sepalis unguiculatis, laminis in anthesi exsertis erectis lanceolatis acutis; petalis unguiculatis, laminis suborbicularibus, apice subacutis; filamentis lineari-subulatis, 6 mm. longis, in parte inferiore paullo latioribus; antheris lineari-subulatis, 10 mm. longis, poro terminali introrso dehiscentibus; ovario late ovoideo, 2 mm. longo; stylo filiformi, 11 mm. longo; ovulis in quoque loculo 8-10; capsula 4-5 mm. longa; seminibus rhomboideo-oblongis, purpureo-brunneis, 1.5 mm. longis, circiter 20-costatis, striis reticulatis.

Sheaths thin, membranaceous, finely nerved, rounded or obtuse at summit; leaves somewhat asymmetric, broader in middle part, narrowed at each end, deep green above, pale green below, midrib prominent and thickened on one side, the nerves on either side of midrib prominent only on one surface (lower), unequal in number; scapes very slender and elongated; the three outermost bracts foliaceous, unequal and elongated, equaling the flower; sepals brown, the blades rigid, chartaceous, cucullate-incurved, 12-13 mm. long, 4.5-5 mm. wide, the claw membranaceous, oblong-rhomboid, slightly enlarged at junction with blade, 4 mm. long, 3 mm. wide, 7-nerved; petals deep yellow, the blade suborbicular, abruptly narrowed to subacute tip, 16 mm. long, 14 mm. wide, the claw 5 mm. long, 2 mm. wide; fertile stamens 3-5, one to three of them becoming partly or completely petaloid; filaments slightly broader in lower half, 6 mm. long, 1.1 mm. wide near base; ovary with 3 cells, 8-10 ovules in each cell (Fig. 17, c-e).

Type in herb. Chi. Nat. Hist. Mus., collected on moist bluffs of Cerro Duida, southeastern-facing sandstone bluffs near Caño Negro (tributary of Caño Iguapo), Territorio Federal Amazonas, alt. 1095-1520 m., August 26, 1944, *Julian A. Steyermark 58040.*

This species is remarkable for the elongated foliaceous outer bracts of the heads. In its slender filiform peduncles it resembles *S. Allenii* Steyermark of Panama, but that has the leaf sheaths tapering rather than abruptly rounded at the summit, while, moreover, in *S. Allenii* the flowers are much smaller and the bracts are strongly imbricate.

Stegolepis Gleasoniana appears to be related to *S. pauciflora* Gleason, from which it differs in the shorter sepals and petals, more slender, almost filiform scapes, which are much narrower below the heads than in *S. pauciflora*, elongated membranaceous outermost 3-4

bracts, much narrower leaf blades throughout the length, acuminate instead of obtuse or subacute bracts, and the delicate, membranaceous instead of rigid and thick leaf sheaths, the nerves being evident in the thin sheaths of *S. Gleasoniana* and not evident in *S. pauciflora*.

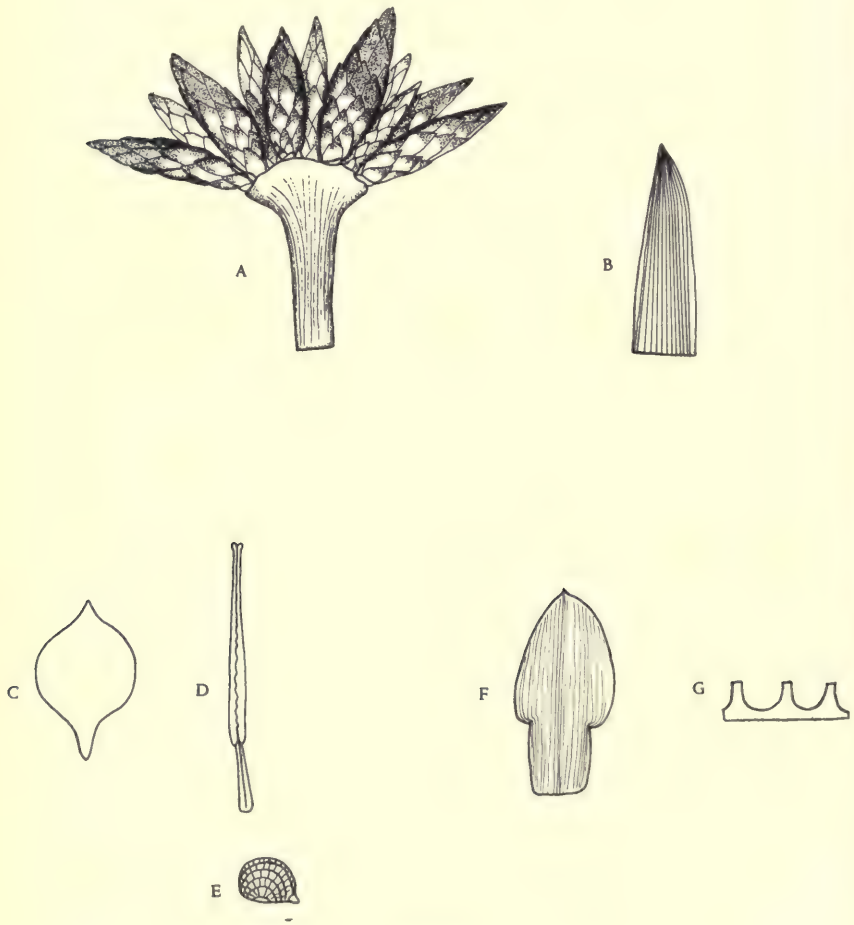

FIGURE 17

Stegolepis ptaritepuiana Steyermark. A, Uppermost part of scape with flower heads (X 1); B, Uppermost part of blade (X 1/2).

Stegolepis Gleasoniana Steyermark. C, Petal (X 1); D, Stamen (X 2); E, Seed (X 5).

Stegolepis parvipetala Steyermark. F, Petal (X 2.5); G, Three of filaments joined at base with one another (highly magnified).

This distinct species is named in honor of Dr. H. A. Gleason of the New York Botanical Garden, who has done much to advance our knowledge of the genus *Stegolepis* and other genera of the Rapateaceae.

Stegolepis parvipetala Steyermark, sp. nov.

Foliorum vaginae conduplicatae, incrassatae coriaceae, superne graduatim angustatae; laminis erectis crassis rigidis coriaceis, uno latere argenteo-viridibus, late linearibus, ad extremos angustatis, 90-100 cm. longis, 1-4.5 cm. latis, in parte media latissimis, pluristriatis, subtus costa media prominenti; scapis elongatis erectis, glabris, pluricostatis, 60-85 cm. longis, 4-6 mm. crassis, apice paullo dilatatis; involucro nullo; floribus 32-35 sessilibus, 14-15 mm. longis; bracteis castaneo-aureis, circiter 22, ovato-triangularibus, obtusis, 3-5 (extimis) ad 10 mm. (intimis) longis, 3-4 mm. latis; sepalis 14 mm. longis, laminis 10 mm. longis, 4.5-5 mm. latis; petalis parvis, 11 mm. longis, laminis ovato-oblongis, subacutis vel obtusis, basi subito obtusis vel cordatis, 8 mm. longis, 4.5-5 mm. latis, unguiculis amplis, 3 mm. longis, 4 mm. latis; filamentis 2.5-3 mm. longis, ad basin corollae adnatis, basi connatis; antheris lineari-lanceolatis, basi valde cordatis; ovulis 27, in quoque loculo 9; stylo 13 mm. longo.

Leaves grass green on one side, silvery side on other; bracts dull orange; claw of sepals 4 mm. long; petals dull yellow, small, recurved or spreading back, connate at base; filaments attached at base of petals, joined to each other at base; anthers 7-8 mm. long (Fig. 17, f-g).

Type in herb. Chi. Nat. Hist. Mus., collected on Ptari-tepuí, on forested south-facing slopes overlying sandstone, on "Cave Rock" above "Cave Camp", state of Bolívar, alt. 1810 m., October 29, 1944, *Julian A. Steyermark 59514* (2 sheets).

This species is distinguished by the small petals with a broad claw and broadly ovate blade, dull orange-castaneous bracts, and the filaments united at base. It resembles *S. angustata* Gleason in the leaf blades cuneate or narrowed at base and in the leaf sheaths gradually narrowed to the summit, but differs in the smaller petals, with a broader claw and differently shaped blade, and in the orange-castaneous instead of pale brown bracts. From *S. guianensis* Klotzsch it differs in the leaf sheath gradually narrowed to the summit, smaller petals with broad claw and ovate blade, and color of bracts.

Stegolepis ptaritepuiensis Steyermark, sp. nov.

Foliorum vaginae conduplicatae incrassatae coriaceae late ovatis, 6.5-8 cm. longis, 4-10 cm. latis, nitentibus, superne rotundatis, marginibus membranaceis fere scariosis; laminis erectis crassis rigidis coriaceis, late linearibus, 25-41 cm. longis, 10-30 mm. latis, apice acutis et angustatis, tenuiter plurinervatis; scapis elongatis,

60-75 cm. altis, 2-3 mm. crassis, subteretibus, apice dilatatis complanatis rotundatis, 5-14 mm. latis, pluricostatis; involucro nullo; floribus fuscis, firme chartaceis, 9-18, sessilibus, 17-20 mm. longis, 5-7 mm. crassis; bracteis 27-28, valde imbricatis, extimis brevissimis late triangularibus vel ovatis, 4-5 mm. longis, 4-5 mm. latis, intermediis late ovatis vel ovato-lanceolatis, 6-8 mm. longis, 3-4 mm. latis, intimis lanceolatis vel oblongo-lanceolatis, 14-17 mm. longis, 4.5-5 mm. latis, omnibus apice abrupte apiculatis vel breve acuminatis; sepalis 18 mm. longis, unguiculatis, laminis oblongo-lanceolatis; petalis luteis, 14 mm. longis, longe unguiculatis, laminis rhomboideo-subrotundatis, apice abrupte acuminatis; filamentis 2 mm. longis; antheris 7.5-8 mm. longis; stylo filiformi, 10.5 mm. longo; ovario 3-loculari, ovulis in quoque loculo 4-5.

Scapes subterete except at the top which is flattened and ends in a rounded tip; sepals with blade 15 mm. long and claw 3 mm. long; petals with blade 10 mm. long, 10 mm. wide, and claw 5 mm. long, 2.5 mm. wide; stamens 6, all fertile; filaments papillate-areolate (Fig. 17, a-b).

Type in herb. Chi. Nat. Hist. Mus., collected on Ptari-tepuí, in swamp on open level portion of plateau on southeast-facing slopes, state of Bolívar, alt. 1600 m.. November 1, 1944, *Julian A. Steyermark 59655;* also collected in sandy wet ground with *Brocchinia*, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Steyermark 59365.*

This species is the common one found at the base of and on the slopes of Ptari-tepuí. It is related to *S. pungens* Gleason of Mount Duida, from which it differs in the narrower, more falcate-ensiform leaves, which are acute instead of obtuse at apex, the heads with more numerous flowers, which are smaller, narrower, and in usually two rows instead of one, as in *S. pungens*, the smaller petals, shorter filaments, smaller bracts, and more slender, subterete instead of flattened scapes.

BROMELIACEAE[11]

Brocchinia melanacra L. B. Smith, sp. nov.

Verisimiliter acaulis, florifera ultra 8 dm. alta; foliis ad 6 dm. longis, integerrimis, utrinque obscure punctulato-lepidotis, vaginis ellipticis, 7-8 cm. longis, membranaceo-marginatis, basi atro-castaneis lucidisque, laminis strictis, anguste triangularibus, ca. 2 cm. latis, parte apicali ca. 5 cm. longa, involuta, incrassata, laevi, subtus atro-castanea, reliqua parte margine revoluta, utrinque viridi, ex sicco rugosa; scapo recto, 5 mm. diametro, glabro; scapi bracteis e late ovato longe acuminatis, eorum laminis cum apicibus foliorum similibus, quam internodiis multo brevioribus; inflorescentia laxe tripinnatim paniculata, ca. 5 dm. longa, omnino glabra; bracteis primariis eis scapi similibus, quam basibus sterilibus ramorum multo brevioribus; ramis strictis, gracilibus; bracteis florigeris ovato-lanceolatis, acutis, ovaria aequantibus vel quam eis brevioribus; floribus breviter sed graciliter pedicellatis, paulo divergentibus; sepalis lanceolatis, acutis, 4.5 mm. longis; petalis anguste panduratis, cucullatis, sepala subaequantibus, albis; staminibus inclusis, filamentis serei secundae cum petalis paulo connatis; ovario obovoideo, trigono, 4 mm. longo, omnino infero; stylis coalitis (Fig. 18, a-e).

Type collected on summit of Cerro Duida, on high moist ridge top, Territorio Federal Amazonas, alt. 1820-2075 m., September 4, 1944, *Julian A. Steyermark 58352*. *Tate 671*, a very immature specimen that came from the summit of Duida and that I could not place previously, is undoubtedly this same species. For comparison with other species see the key below.

Brocchinia secunda L. B. Smith, sp. nov.

Caulescens, florifera verisimiliter sesquimetralis vel ultra; caule reclinato, ultra 3 dm. longo, 7 mm. diametro, foliaceo; foliis ad 23 cm. longis, integerrimis, supra glabris, subtus dense punctulato-lepidotis, vaginis ellipticis, ca. 5 cm. longis, quam laminis haud latioribus, laminis anguste subtriangularibus, acuminatis sed apice ipse acutis apiculatisque, 35 mm. latis, planis, margine angusto albido excepto utrinque viridibus, areolatis; scapo ignoto; inflorescentia laxissime tripinnatim paniculata, fere metralis, sparse minuteque albido-furfuracea; bracteis primariis ex ovato acuminatis, parvis, quam basibus sterilibus ramorum multo brevioribus, punctulato-lepidotis; ramis divergentibus, gracillimis, ultimis saepe secundis; bracteis florigeris ovatis, acutis, 2-3.5 mm. longis, pedicellos graciles superantibus, membranaceis; floribus secundis, patentibus; sepalis lanceolatis, obtusis, 6 mm. longis, basi incrassatis, ecarinatis; petalis late ovatis, cucullatis, basi breviter unguiculatis, sepala subaequantibus, albis; staminibus inclusis; ovario gracillime cylindrico, ad 18 mm. longo, paulo supero; stylis liberis (Fig. 18, f-j).

[11] By Lyman B. Smith

Type collected on moist face of dripping sandstone bluffs, Ptaritepuí, steep forested slopes at base of first line of sandstone bluffs, on south-facing part, east of "Cave Rock", state of Bolívar, alt. 2130 m., November 4, 1944, *Julian A. Steyermark 59863.*

Brocchinia Steyermarkii L. B. Smith, sp. nov.

Florifera 6 dm. alta (!Steyermark); foliis ad 7 dm. longis, strictis, utrinque subdense punctulato-lepidotis, vaginis late ovatis, ca. 8 cm. longis, basi castaneis, laminis anguste subtriangularibus, pungentibus, ca. 35 cm. latis, ex sicco involutis, reticulatis; scapo erecto, 1 cm. diametro; scapi bracteis foliaceis, infimis dense imbricatis; inflorescentia ample 3- vel 4-pinnatim paniculata, minute denseque brunneo-flocculosa; bracteis primariis subfoliaceis, parvis, supremis quam basibus sterilibus ramorum multo brevioribus; ramis

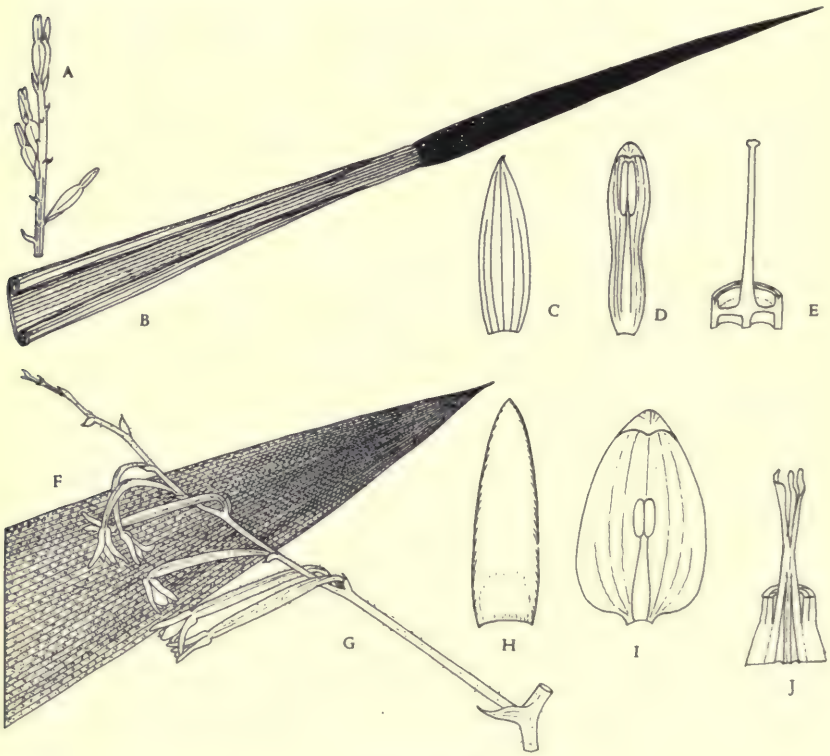

FIGURE 18

Brocchinia melanacra. A, Apex of branch (X 1); B, Apex of leaf (X 1); C, Sepal (X 5); D, Petal (X 5); E, Apical section of ovary (X 10).

Brocchinia secunda. F, Apex of leaf (X 1); G, Branch (X 1).

divergentibus, gracilibus, ultimis plerumque subfasciculatis; bracteis florigeris late ovatis, acutis, quam ovariis multo brevioribus; floribus sessilibus, divergentibus; sepalis subtriangularibus, 4 mm. longis, haud carinatis; petalis ellipticis, obtusis, nullo modo cucullatis, sepala subaequantibus, aurantiacis; staminibus inclusis, filamentis latis, basi cum sepalis petalisque connatis; ovario oblongo-ellipsoideo, triangulato, 8 mm. longo, omnino infero; stylis coalitis (Fig. 19, a-e).

Type collected in swampy savanna, bordering forest of Río Karuai, between Santa Teresita de Kavanayén and base of Ptari-tepuí, state of Bolívar, alt. 1220 m., November 18, 1944, *Julian A. Steyermark 60347.*

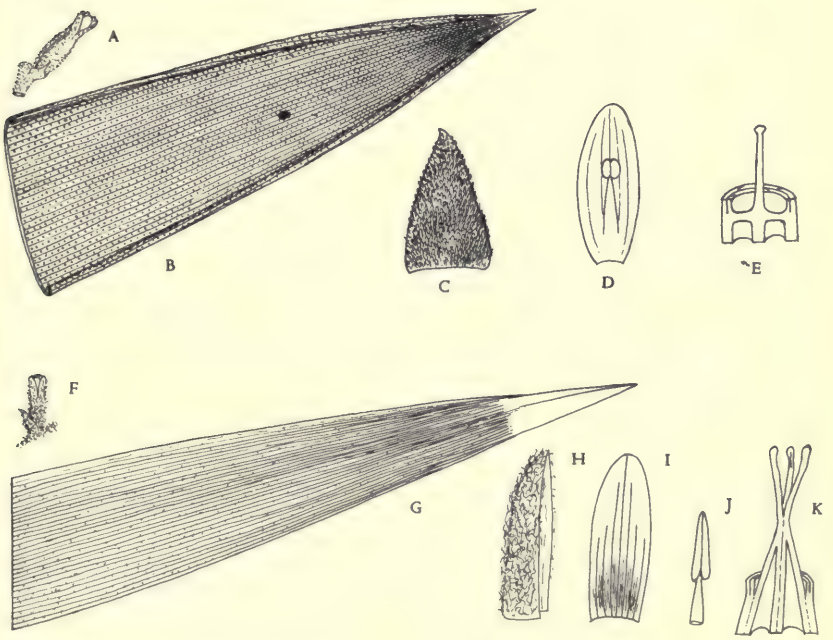

FIGURE 19

Brocchinia Steyermarkii. A, Flower (X 1); B, Apex of leaf (X 1); C, Sepal (X 5); D, Petal (X 5); E, Apical section of ovary (X 5).

Brocchinia vestita. F, Flower (X 1); G, Apex of leaf (X 1); H, Sepal (X 5); I, Petal (X 5); J, Stamen (X 5); K, Apical section of ovary (X 5).

Brocchinia vestita L. B. Smith, sp. nov.

Parva, e fragmentis solum cognita; foliis ca. 2 dm. longis, vaginis brevibus, quam laminis vix latioribus, atro-castaneis, laminis anguste triangularibus, acuminatis, pungentibus, planis, ad 28 mm. latis, integerrimis, supra glabris lucidisque, subtus subdense punctulato-lepidotis, utrinque viridibus; scapo erecto, 6 mm. diametro, dense brunneo-puberulo; scapi vaginis anguste triangularibus, acuminatis, glabris, ad apicem versus incrassatis, supremis quam internodiis bene brevioribus; inflorescentia subdense tripinnatim paniculata, 25 cm. longa, 15 cm. diametro, bracteis primariis exceptis dense puberula; bracteis primariis eis scapi similibus, ad 18 mm. longis; ramis gracilibus, sublaxifloris; bracteis florigeris e late ovato acuminatis, quam ovariis subduplo brevioribus, tenuibus; floribus sessilibus, divergentibus vel patentibus; sepalis oblongo-ellipticis, obtuse carinatis cucullatisque, 4 mm. longis; petalis oblongo-ellipticis, obtusis, sepala subaequantibus, albis; staminibus liberis, inclusis; ovario 5-6 mm. longo, tereti, paulo supero; stylis liberis (Fig. 19, f-k).

Type collected on ridge top, summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58279.* For comparison with other species see the key below.

The following key will serve to relate the new species of *Brocchinia,* proposed in this paper, to my treatment in the Contributions from the Gray Herbarium **161**: 30. 1946.

1. Ovary only one-third inferior; leaves and scape-bracts serrate. *B. serrata.*
1. Ovary wholly or almost wholly inferior.
   2. Leaf-blades narrowly triangular or subtriangular, acute or acuminate.
      3. Capsule trigonous.
         4. Flowers sessile; petals orange .....*B. Steyermarkii.*
         4. Flowers slenderly pedicellate.
            5. Leaf-blades, scape-bracts and primary bracts of uniform texture; inflorescence bipinnate *B. prismatica.*
            5. Leaf-blades, scape-bracts and primary bracts with dark castaneous indurate involute apices; inflorescence tripinnate .....*B. melanacra.*
      3. Capsule terete.
         6. Leaf-sheaths prominent, 20-25 cm. long, dark castaneous; inflorescence narrow .....*B. acuminata.*
         6. Leaf-sheaths inconspicuous, much smaller; inflorescence broad.

7. Flowers secund; ovary slender, 18 mm. long
B. secunda.

7. Flowers not secund; ovary stout, 5-6 mm. long
B. vestita.

2. Leaf-blades ligulate, rounded and apiculate (no new species under this heading).

Connellia caricifolia L. B. Smith, sp. nov.

Caulescens, ramosa, florifera 17 cm. alta; caule ultra 1 dm. longo, 2-3 mm. diametro; foliis dense quaquaversis, 6 cm. longis, omnino inermibus, vaginis late ovatis, 2 cm. longis, glabris, sulcatis, laminis linearibus, 4 mm. latis, supra glabris, subtus perobscure punctulato-lepidotis, marginibus albis cartilagineis exceptis utrinque viridibus; scapo erecto, 2-2.5 mm. diametro, brunneo, lucido; scapi bracteis internodia superantibus sed scapum haud obtengentibus, late ovatis, lucidis, infimis caudatis; inflorescentia simplicissima, laxe perpauciflora, glabra; bracteis florigeris late ellipticis, apiculatis, ad 14 mm. longis, pedicellos graciles superantibus; floribus erectis; sepalis ellipticis, ca. 12 mm. longis, tenuibus; petalis 2 cm. longis, unguiculatis, roseis, lamina suborbiculari; staminibus stylo-que inclusis; ovario supero (Fig. 20, a-b).

Type collected on exposed surface of morros, summit of Mount Roraima, on northwest portion north and northwest of Summit Camp, state of Bolívar, alt. 2620-2740 m., September 27, 1944, *Julian A. Steyermark 58846.* The flowers are very similar to those of *C. Quelchii*, also from Mount Roraima, but the leaves are weak, glabrous above and prominently white-margined where those of *C. Quelchii* are stiff, densely lanate above and essentially uniform in texture.

With considerable misgiving I am restoring the genus *Connellia*, because it represents the least objectionable of several awkward choices. To include *C. Augustae*, *C. Quelchii* and the two new species here proposed, in *Puya*, involves too much contradiction in the key to genera. The technical characters of capsule-dehiscence and seed-appendages place *Connellia* much closer to *Lindmania* than to *Puya* which it more closely resembles in habit.

To reduce *Connellia* to *Lindmania* would be logical, especially in view of the intermediate position of *Lindmania guianensis*, but I hesitate to do so until it is possible to establish the validity of *Lindmania* as distinct from the earlier *Cottendorfia*. *Lindmania guianensis* has the placentae practically as reduced as in *Cottendorfia*, and the discovery of fruit of the latter may show that the rather doubtful distinction on ovule-appendage is equally untenable.

Phylogenetically, *Connellia* appears to link *Puya* to *Lindmania* but to be closer to the latter.

FIGURE 20

Connellia caricifolia. A, Scape and inflorescence (X 1); B, Leaf (X 1).

Connellia nutans. C, Base of leaf (X 1); D, Branch of inflorescence (X 1); E, Flower (X 1); F, Petal and stamen (X 1).

The following key summarizes the distinctions discussed above:

1. Seeds broad, alate; capsule primarily loculicidal; petals strongly spirally twisted together after anthesis. ..... *Puya*

1. Seeds narrow, caudate or apiculate; capsule septicidal (unknown in *Cottendorfia*) or sometimes about equally both; petals not twisted together after anthesis.

   2. Seeds or ovules merely apiculate; placentae basal. *Cottendorfia*

   2. Seeds long-caudate; placentae usually extending almost the height of the cell.

      3. Petals white, colorless, separate after anthesis; sepals not over 5 mm. long, thin, flat; plants slender. *Lindmania*

      3. Petals brightly colored, more or less massed together after anthesis but not twisted; sepals larger and firmer; plants relatively robust. .....*Connellia*

Connellia nutans L. B. Smith, sp. nov.

Dense aggregata, plus minusve caulescens (?), planta fructifera metralis vel ultra; foliis multis, caulem quaquaverse denseque vestientibus, ca. 3 dm. longis, vaginis amplis, basi medioque integris, dissite perobscureque punctulatis, brunneis, lucidis, laminis anguste triangularibus, acuminatis, ad 3 cm. latis, basi extrema dentibus ad 2 mm. longis dense armatis alibi integris, infimis delapsis; scapo decurvato, 14 mm. diametro, scapi bracteis erectis, dense imbricatis, subfoliaceis sed omnino inermibus; inflorescentia bipinnatim paniculata, 2-7 dm. longa, 8-12 cm. diametro, subthyrsoidea, glabra; bracteis primariis e late ovato acuminatis; ramis strictis, gracilibus, floriferis brevibus sed fructiferis ad 18 cm. longis et bracteas multo superantibus; bracteis florigeris oblongo-lanceolatis, 17 mm. longis, brunneis, tenuibus; pedicellis gracillimis, 10 mm. longis; sepalis ellipticis, obtusis, 14 mm. longis, carinatis, brunneis, lucidis; petalis bene unguiculatis roseis, lamina suborbiculari; staminibus styloque inclusis; ovario supero; seminibus caudatis (Fig. 20 c-f).

Type collected along base of east-facing high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2410-2450 m., November 7, 1944, *Julian A. Steyermark 59933*; common type on bluffs, in dense mats. The flower and seed of *Connellia nutans* closely resemble those of *C. Augustae*, but the deflexed inflorescence of the former quickly distinguishes it. Also even in fruit the branches of *C. Augustae* are very short. *Steyermark 59611*, from south-facing high sandstone bluffs, Ptari-tepuí, October 30, 1944, alt. 2400-2410 m., is sterile, but so closely resembles the type of *C. nutans* that it seems very likely that it is the same species.

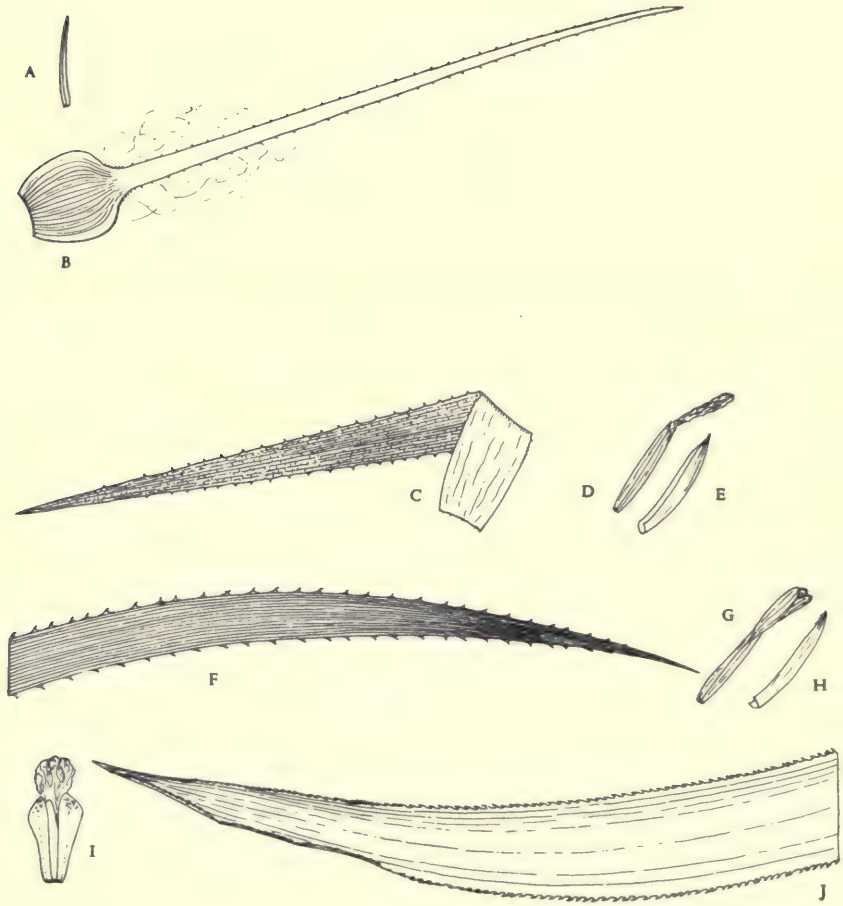

FIGURE 21

Navia aurea. A, Floral bract (X 1); B, Leaf (X 1).

Navia glauca. C, Leaf (X 1); D, Flower (X 1); E, Floral bract (X 1).

Navia Steyermarkii. F, Leaf-blade (X 1); G, Flower (X 1); H, Floral bract (X 1).

Navia xyridiflora. I, Flower (X 1); J, Leaf-blade (X 1).

Guzmania confinis L. B. Smith, sp. nov.

Acaulis, florifera ad 5 dm. alta; foliis strictis, dense rosulatis, ad 23 cm. longis, viridibus (!Steyermark), vaginis ellipticis, lamina fere aequantibus, utrinque punctulato-lepidotis, laminis anguste triangularibus, 23 mm. latis, subtus obscure punctulato-lepidotis, supra densissime cinereo-lepidotis, margine revolutis; scapo erecto, gracili; scapi vaginis subfoliaceis, densissime imbricatis, purpureis; inflorescentia dense bipinnatim paniculata, cylindrica; bracteis primariis eis scapi similibus sed gradatim brevioribus, infimis flores multo superantibus; ramis subabortivis, flores 3 subfasciculatim gerentibus; bracteis florigeris suborbicularibus, 5 mm. longis, quam sepala multo brevioribus, membranaceis, sparse lepidotis; sepalis oblongis, late obtusis, 10 mm. longis, ad 6 mm. connatis, membranaceis, sparse lepidotis; petalis 20 mm. longis, alte conglutinatis, nudis, albis, laminis ellipticis; staminibus styloque inclusis; capsula cylindrica, rostrata, 2 cm. longa (Fig. 22, a-b).

Type collected on limestone outcrops of Páramo de Tamá, near Colombian-Venezuelan boundary, state of Tachira, alt. 3045-3475 m., July 15, 1944, *Julian A. Steyermark 57380*; terrestrial, the common dominant type, forming dense colonies. *Guzmania confinis* is much more conspicuously lepidote on the upper surface of its leaves and bracts than on the lower, a character shared by *G. palustris*, but not by its other near relatives, *G. Mosquerae* and *G. cryptantha*. *Guzmania palustris* has a much stouter habit and broader leaves and bracts than *G. confinis* and its flowers are about twice as large. Mez has placed such species with highly connate sepals in *Thecophyllum*, but in every instance that I have been able to check, the corolla proves them to be typical of *Guzmania*.

Guzmania retusa L. B. Smith, sp. nov.

Acaulis; foliis suberectis, 5 dm. longis, inflorescentiam superantibus, utrinque minute obscureque punctulato-lepidotis, vaginis magnis sed haud distinctis, laminis lingulatis, 6 cm. latis, apice late rotundatis et retuso-apiculatis, subtus pallide purpureis, supra purpureo-maculatis, margine anguste purpureis; scapo erecto, gracili; scapi bracteis erectis, dense imbricatis, ellipticis, apiculatis, punctulato-lepidotis; inflorescentia simplicissima, dense ellipsoidea, 4.5 cm. longa, 2 cm. diametro, apicem usque fertili; bracteis florigeris orbicularibus, leviter convexis, 2 cm. diametro, sepala superantibus, coriaceis, lucidis, punctulato-lepidotis, nervatis vel fere laevibus; floribus subsessilibus; sepalis ellipticis, 13 mm. longis, aequaliter ad 5 mm. connatis, carinatis, coriaceis, apice sparse lepidotis; petalis 23 mm. longis, flavis, laminis late ellipticis; staminibus styloque inclusis (Fig. 23, a-c).

Type collected on lower south-facing slopes between Río Karuai and first ridge above Río Karuai, Ptari-tepuí, state of Bolívar, alt. 1220 m., November 28, 1944, *Julian A. Steyermark 60677*; terrestrial. I hesitate to describe a species from two specimens coming from

FIGURE 22

Guzmania confinis. A, Branch (X 1); B, Inflorescence (X 1).

Pitcairnia tuberculata. C, Branch of inflorescence (X 1).

Tillandsia lacera. D, Petal (X 1); E, Branch of inflorescence (X 1); F, Sepal (X 1).

localities some seventeen hundred miles apart, so the above description is wholly from the type. However, I can find no significant difference in *Steinbach 9623* which comes from the department of Cochabamba in Bolivia.

Navia aurea L. B. Smith, sp. nov.

Breviter caulescens; caule haud ultra 10 cm. longo, 8 mm. diametro; foliis multiseriatis, persistentibus, caulem omnino obtegentibus, vaginis late obovatis, 12 mm. longis, tenuibus, nervatis, ad apicem versus subdense serrulatis, laminis linearibus, acuminatis pungentibusque, 8 cm. longis, 2-3 mm. latis, laxe minuteque serrulatis, coriaceis, viridibus (!Steyermark), juvenilibus ad basin versus laxissime albido-floccosis, per aetate glabris lucidisque; inflorescentia dense capituliforme, sessile; bracteis florigeris anguste lanceolatis, sepala subaequantibus, apice minute serrulatis; floribus imperfecte cognitis, sessilibus; sepalis liberis, lineari-lanceolatis, longe acuminatis, ca. 12 mm. longis, tenuibus, glabris, lateralibus carinatis; petalis aureis, ca. 25 mm. longis (Fig. 21,a-b).

Type collected in dry rock crevices of bluff along Caño Negro, summit of Cerro Duida, Savanna Hills, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58219*. Its bright yellow flowers immediately separate *Navia aurea* from all other known members of the genus, yet its very fine many-ranked leaves with their delicate cobwebby indument distinguish it even when sterile.

Navia duidae L. B. Smith var. **glabrior** L. B. Smith, var. nov.

Differt foliis subtus minute punctulato-lepidotis, glaucis, haud cinereis.

Type collected along rocky banks of Caño Negro, summit of Cerro Duida, between Brocchinia Hills and Savanna Hills, Territorio Federal Amazonas, alt. 1050-1600 m., September 2, 1944, *Julian A. Steyermark 58210*; terrestrial among rocks.

Navia glauca L. B. Smith, sp. nov.

Caulescens; caule ad 15 cm. longo, 1 cm. diametro; foliis caulem dense quaquaverse vestientibus, patentibus, vaginis brevibus, omnino occultatis, laminis anguste triangularibus, acuminatis, pungentibus, infra 7 cm. longis, ad 9 mm. latis, laxe minuteque serrulatis, coriaceis, supra glabris viridibusque, subtus minute piloso-lepidotis et glaucis; inflorescentia dense capituliforme, in foliorum centro nidulante, pauciflora; bracteis florigeris lanceolatis, sepala superantibus, glabris; floribus sessilibus; sepalis liberis, 14 mm. longis, oblongo-lanceolatis, acutis, glabris, posticis carinatis; petalis ad 23 mm. longis, albis; staminibus styloque inclusis (Fig. 21, c-e).

Type collected on summit of Cerro Duida, on high moist ridge top, Territorio Federal Amazonas, alt. 1820-2075 m., September 4, 1944, *Julian A. Steyermark 58320.*

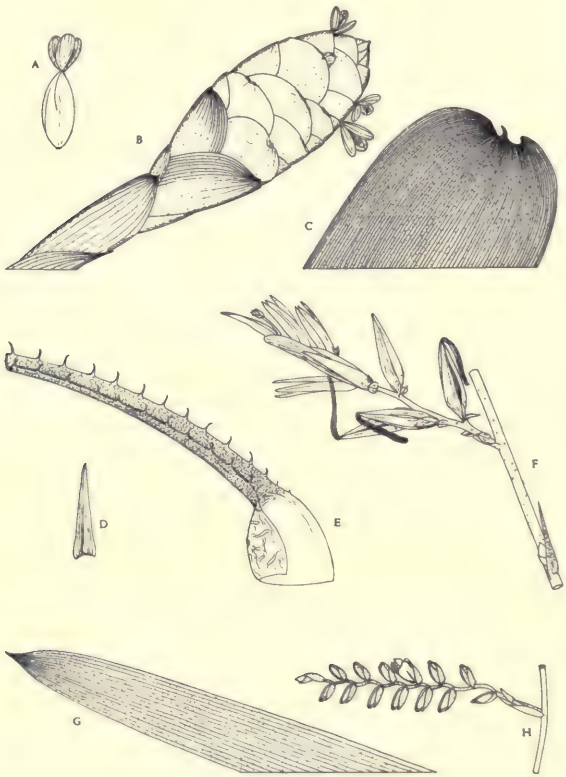

FIGURE 23

Guzmania retusa. A, Flower (X 2/3); B, Inflorescence (X 2/3); C, Apex of leaf (X 2/3).

Pitcairnia cinerea. D, Sepal (X 2/3); E, Leaf (X 2/3); F, Branch of inflorescence (X 2/3).

Tillandsia stenoglossa. G, Apex of leaf (X 2/3); H, Branch of inflorescence (X 2/3).

Navia Steyermarkii L. B. Smith, sp. nov.

Caulescens; caule ultra 2 dm. longo; foliis caulem dense quaquaverse vestientibus, patentibus, vaginis brevibus, omnino occultatis, laminis linearibus, acuminatis, ca. 20 cm. longis, 8 mm. latis, laxe

minuteque serrulatis, supra glabris, subtus dissite piloso-lepidotis mox glabris, utrinque viridibus; inflorescentia dense capituliforme, in foliorum centro nidulante, 15 mm. diametro; bracteis florigeris lanceolatis, sepala superantibus, ad apicem versus serrulatis; floribus sessilibus; sepalis liberis, 13 mm. longis, oblongo-lanceolatis, acutis, glabris, posticis carinatis; petalis ad 21 mm. longis, albis; staminibus styloque inclusis (Fig. 21,f-h).

Type collected on moist southeastern-facing sandstone bluffs near Caño Negro (tributary of Caño Iguapo), Cerro Duida, Territorio Federal Amazonas, alt. 1095-1520 m., August 26, 1944, *Julian A. Steyermark 58012.*

Navia xyridiflora L. B. Smith, sp. nov.

Aggregata, caulescens; caule robusto, ultra 1 dm. longo; foliis caulem dense quaquaverse vestientibus, persistentibus, patentibus, vaginis brevibus, omnino occultatis, laminis linearibus, acuminatis, ad 19 cm. longis, 16 mm. latis, dense minuteque serrulatis, supra glabris viridibusque, subtus griseis, dissite minuteque punctulato-lepidotis; inflorescentia dense capituliforme, in foliorum centro nidulante, pauciflora; bracteis florigeris ellipticis, apiculatis, sepala superantibus, coriaceis, brunneis, apice lepidotis; floribus sessilibus; sepalis liberis, posticis spathulatis, 11 mm. longis, ad apicem versus valde alatis et lepidotis; petalis albis, delapsis solum cognitis (Fig. 21, i-j).

Type collected on dry slopes, Brocchinia Hills, Cerro Duida, Territorio Federal Amazonas, alt. 1700-1980 m., September 1, 1944, *Julian A. Steyermark 58152.* In habit, *Navia xyridiflora* appears practically identical with *N. angustifolia* except for a slightly more even upper leaf-surface, yet the sepals show the strongest contrast in the genus. In *N. xyridiflora* they are strongly heteromorphic with the posterior ones spatulate and broadly alate, while in *N. angustifolia* they are all lance-oblong and not at all alate.

The following key shows how the above novelties are distinguished from previously known members of *Navia:*

1. Inflorescence elongate, interrupted .....*N. caulescens.*

1. Inflorescence densely capitate or glomerate.

2. Leaf-blades 12-19 mm. broad, densely serrulate.

3. Inflorescence distinctly scapose, glomerate from several heads; leaf-blades densely white-lanate beneath; sepals 5.5 mm. long. *N. bicolor.*

3. Inflorescence sessile, capitate; leaf-blades glabrous or sparsely and obscurely punctulate-lepidote beneath; sepals 11-19 mm. long.

4. Sepals to 19 mm. long, lance-oblong, subsimilar, not dilated toward apex. .....*N. angustifolia.*

4. Sepals not over 11 mm. long, the posterior ones much dilated toward apex, alate-carinate. .....*N. xyridiflora.*

2. Leaf-blades less than 10 mm. wide.

5. Sepals not over 6 mm. long.

6. Leaf-blades 6 mm. broad. .....*N. acaulis.*

6. Leaf-blades less than 3 mm. broad.

7. Leaf-blades soon deciduous and exposing the branched stem, 3 cm. long. .....*N. Schultesiana.*

7. Leaf-blades persistent and concealing the stem, 10 cm. long. .....*N. graminifolia.*

5. Sepals 10-19 mm. long.

8. Leaf-blades tapering evenly from base to apex; sepals free.

9. Leaf-blades not over 9 cm. long.

10. Petals bright yellow; leaf-blades laxly serrulate, 2-3 mm. wide, 8 cm. long; floral bracts serrulate. ..*N. aurea.*

10. Petals white or flavous; floral bracts entire.

11. Leaf-blades densely serrulate, 4.5 mm. wide, 5 cm. long. .....*N. brachyphylla.*

11. Leaf-blades laxly serrulate, to 9 cm. long.

12. Leaf-blades pruinose-lepidote beneath with linear scales, less than 7 cm. long but 9 mm. wide. *N. glauca.*

12. Leaf-blades appressed-lepidote beneath.

13. Scales of the lower surface of the leaf-blade with distinct free margins, making the surface appear cinereous-scurfy. .....*N. duidae.*

13. Scales of the lower surface of the leaf-blade punctiform, immersed, making the surface appear glabrous. .....*N. duidae* var. *glabrior.*

9. Leaf-blades about 20 cm. long, 8 mm. wide; floral bracts serrulate toward apex. .....*N. Steyermarkii.*

8. Leaf-blades narrowed or inrolled toward base, 13-22 cm. long; sepals much connate.

14. Leaf-blades subentire with only a few teeth near the base. .....*N. Gleasonii.*

14. Leaf-blades sparsely serrulate throughout.

15. Stem 22 cm. or longer; leaf-blades to 25 cm. long, 9.5 mm. wide; sepals 16 mm. long. .....*N. Maguirei.*

15. Stem 6-10 cm. long; leaf-blades less than 20 cm. long, 5 mm. wide; sepals 10 mm. long.

N. Maguirei var. *minor.*

Pitcairnia cinerea L. B. Smith, sp. nov.

E fragmentis solum cognita, verisimiliter acaulis, florifera ultra 3-4.5 dm. alta (!Steyermark); foliis homomorphis, bulbose rosulatis, ca. 3 dm. longis, vaginis late ovatis, 15 mm. longis, crasse coriaceis, inflatis, laminis arcuato-recurvatis, linearibus, longe acuminatis, 10 mm. latis, coriaceis, margine spinis patentibus gracilibus ad 3 mm. longis laxe armatis, supra dissite lepidotis, mox glabris, subtus densissime adpresseque cinereo-lepidotis; scapo erecto, 3.5 mm. diametro, cinereo-lepidoto, mox glabro; scapi bracteis infimis foliaceis, internodia multo superantibus, supremis angustissime triangularibus, parvis, quam internodia multo brevioribus, integris; inflorescentia laxe bipinnatim paniculata, sparsissime lepidota; bracteis primariis supremis scapi similibus, quam ramis multo brevioribus; ramis divaricatis, subdense florigeris, ad 6 cm. longis; bracteis florigeris late ellipticis, apiculatis, 3-4 mm. longis, tenuibus; floribus divergentibus, sessilibus; sepalis anguste subtriangularibus, apice asymmetrice acutis, 15-18 mm. longis, coriaceis, basi alato-carinatis; petalis angustis, 25 mm. longis, nudis, margine minutissime denticulatis, pallide viridibus; staminibus styloque inclusis; ovario 2/3 supero, parte infero obconico, 6-alato; ovulis alatis (Fig. 23, d-f).

Type collected on igneous rock outcrops, Puerto Ayacucho, Territorio Federal Amazonas, alt. 200 m., September 11, 1944, *Julian A. Steyermark 58514.* Because of its alate ovules, *Pitcairnia cinerea,* along with *P. armata, P. ctenophylla, P. heliophylla* and *P. patentiflora,* would seem to belong in section *Schweideleria.* It is interesting to note that all these species agree in their very narrow spiny leaf-blades, while all the species previously grouped in the section have distinctly petiolate broad-bladed leaves with few or no spines. *Pitcairnia cinerea* is very unusual in the genus for its 6-winged ovary.

Pitcairnia tuberculata L. B. Smith, sp. nov.

E fragmentis fructiferis solum cognita, verisimiliter acaulis et florifera ultra metralis; foliis rosulatis, ultra 7 dm. longis, vaginis suborbicularibus, 3 cm. longis, integris, atro-castaneis, extus ad apicem versus densissime brunneo-lepidotis, laminis sublinearibus, acuminatis, basi paulo angustatis sed haud petiolatis, ad 2 cm. latis, his vetustis glabris, toto margine spinis gracilibus atris ad 2 mm. longis laxe armatis; scapo erecto, 8 mm. diametro, scapi bracteis foliaceis, internodia superantibus sed scapum nullo modo occultantibus; inflorescentia ampla, laxe bi- vel tripinnatim paniculata; bracteis primariis angustissime triangularibus, ad 3 cm. longis, quam basibus sterilibus ramorum multo brevioribus; ramis gracilibus,

ad 25 cm. longis, ad apicem versus minute tuberculatis; bracteis florigeris ellipticis, apiculatis, 5 mm. longis, quam pedicellis multo brevioribus; floribus patentibus, saepe secundis; pedicellis 1 cm. longis, gracilibus, tuberculatis; sepalis anguste triangularibus, ad 27 mm. longis, ecarinatis, subcoriaceis, densissime grosseque tuberculatis; petalis delapsis solum cognitis, linearibus, 5 cm. longis, nudis; staminibus verisimiliter inclusis; ovario 4/5 supero; ovulis caudatis (Fig. 22, c).

Type collected along dry grassy slopes following quebrada, between Beguilla and Mucuchachí, state of Mérida, alt. 1065-2430 m., May 4, 1944, *Julian A. Steyermark 56297*. *Pitcairnia tuberculata* is strongly reminiscent of *P. echinata* but has naked petals, much smaller sepals and floral bracts and much more complex indument on the sepals. The indument of *P. tuberculata* consists of rods so sculptured as to be dendritic in form. On account of the naked petals, *P. tuberculata* would fall close to *P. ferruginea* in the key in the Pflanzenreich, but the latter has merely stellate indument and poorly demarcated leaf-sheaths.

Tillandsia lacera L. B. Smith, sp. nov.

Acaulis, florifera 27 cm. alta; foliis multis, dense rosulatis, erectis, 12-20 cm. longis, utrinque dense adpresseque lepidotis, vaginis late ovatis vel suborbicularibus, atro-castaneis, laminis anguste triangularibus, long acuminatis, 2-3 cm. latis, cinereo-lepidotis; scapo erecto, gracili; scapi vaginis dense imbricatis, ellipticis, dense lepidotis, infimis foliaceo-laminatis, alteris late rotundatis dein abrupte lineari-caudatis vel apiculatis, ex sicco chartaceis; inflorescentia dense bipinnatim paniculata, breviter cylindrica, 7 cm. longa, 3.5 cm. diametro; bracteis primariis eis supremis scapi similibus, erectis, bases steriles spicarum subaequantibus, spicis e basi sterili nuda erecta divergentibus, dense 4-6-floris, oblongis, acutis, complanatis, 20 mm. longis, 8 mm. latis; bracteis florigeris dense imbricatis, lanceolatis, subcucullatis, 9 mm. longis, sepala paulo superantibus, obtuse carinatis, chartaceis, nervatis, dense adpresseque cinereo-lepidotis; floribus subsessilibus; sepalis liberis, lanceolatis, late acutis, 8 mm. longis, carinatis, nervatis, glabris; petalis 13 mm. longis, auriculis binis praeditis, laminis oblongis, late rotundatis, valde laceratis, fulgide lilacinis, stamina styloque superantibus (Fig. 22, d-f).

Type collected in thickets along quebrada, above Betania, at base of Páramo de Tamá, state of Tachira, alt. 2285-2430 m., July 14, 1944, *Julian A. Steyermark 57282*.

On account of its lacerate auricled petals, *Tillandsia lacera* is obviously related to *T. heterandra*, but it differs in its abruptly caudate upper scape-bracts, denser inflorescence, and short spikes with naked sterile bases.

Tillandsia rubra R. & P. var. **reducta** L. B. Smith, var. nov.

Differt planta minore, 6-10 dm. alta; inflorescentia simplex vel e spica terminali normali et lateralibus abortivis formata.

Type collected on southeastern portion of base of Carrao-tepuí, state of Bolívar, alt. 1460-1615 m., December 4-5, 1944, *Julian A. Steyermark 60851* (inflorescence simple); epiphyte on lower part of tree trunk. Also collected on ridge shoulder between Quebrada de Morro and Quebrada Cortijo, by boundary line Lara-Trujillo, above Humocaro Bajo, state of Trujillo, alt. 2600-2800 m., February 6, 1944, *Steyermark 55334* (cotype, with inflorescence with aborted lateral branches); epiphyte in crotches of shrub.

Tillandsia (Pseudo-Catopsis) **stenoglossa** L. B. Smith, sp. nov.

Acaulis, florifera 3 dm. alta; foliis paucis, subbulbose rosulatis, 26 cm. longis, scapum superantibus, utrinque dense punctulato-lepidotis, vivo omnino roseis (!Steyermark), exterioribus valde reductis, vaginis late ovatis, ad 10 cm. longis, laminis anguste lingulatis, 16 mm. latis, apice late acutis apiculatisque, planis; scapo erecto, gracillimo, mox glabro; scapi bracteis oblongis, parvis, remotis, cinereo-lepidotis; inflorescentia erecta, laxe bipinnatim paniculata, 10 cm. longa, sparsissime cinereo-lepidota; bracteis primariis eis scapi similibus, bases breves steriles ramorum paulo superantibus; spicis secunde patentibus, laxe florigeris, 5 cm. longis, 1 cm. latis; rhachi flexuosa, gracili, angulata; bracteis florigeris ovatis, acutis, ecarinatis, quam sepalis distincte brevioribus, fere laevibus; floribus valde divergentibus, nullo modo secundis; sepalis liberis, obovatis, asymmetricis, 5 mm. longis, laevibus (Fig. 23, g-h).

Type collected in *Bonnetia roraimae* forest on southwest-facing shoulder, Ptari-tepuí, bordering swamp, state of Bolívar, alt. 2000-2200 m., November 2, 1944, *Julian A. Steyermark 59775*. In my key in the Contributions from the Gray Herbarium, **89**: 16, this species would fall next to *Tillandsia parviflora* and *T. guanacastensis*. It differs from both of them in its ligulate leaf-blades and from *T. guanacastensis* in its lax spikes.

COMMELINACEAE

Aneilema gracilis (H.B.K.) Steyermark, comb. nov.

Tradescantia gracilis H.B.K. Nov. Gen. & Sp. 7: 261. *pl.* 672. 1825.

Aneilema gracilis, forma **bicolor** (Kunth) Steyermark, comb. nov.

Tradescantia gracilis β *bicolor* (Kunth) C. B. Clarke in DC. Mono. Phan. 3: 298. 1881.

Tradescantia bicolor Kunth, Enum. 4: 88. 1843.

South-facing slopes of Cordillera del Avila, just above Caracas, along trail towards Los Venados, Distrito Federal, alt. 1520-1675 m., *Steyermark 55027.*

The stamens in this collection are 6 in number, all fertile, equal and similar, and barbate in the lower third. So far as the 6 equal stamens are concerned, the collection matches H.B.K's plate 672 of *Tradescantia gracilis.*

Phaeosphaerion pseudomonosperma (O. Ktze.) Steyermark, comb. nov.

Athyrocarpus Pseudomonosperma O. Ktze. Rev. Gen. Pl. 3, pt. 2: 319. 1898.

Monagas: Montaña de Aguacate, along Quebrada de Pajarral, tributary to Río Caripe, northeast of Alto de Aguacate, between Caripe and Caripito, alt. 600-900 m., *Steyermark 62217.*

Tradescantia venezuelensis Steyermark, sp. nov.

Perennis, caulibus erecto-adscendentibus, basi decumbentibus, glabris, 40 cm. longis; foliis membranaceis, oblongo- vel ovato-lanceolatis, acutis, basi obtusis vel rotundatis valde asymmetricis, supra viridibus, subtus argenteo-viridibus, 3.5- 7 cm. longis, 1.5-2.5 cm. latis, utrinque pilosis; vaginis 5-8 mm. longis, 3-5 mm. latis, marginibus apicibusque ciliatis, apice oblique truncatis; pedunculis 1.5-3.5 cm. longis uno latere dense pilosulis; bracteis 2, subaequalibus, cordato-ovatis, obtusis, 12-13 mm. longis, 12 mm. latis, marginibus dense ciliatis; sepalis ovato-oblongis, obtusis, falcato-asymmetricis, 3 mm. longis, sepalorum 2 tenuibus glabris, tertio uno latere carinato, carina ciliata; petalis albis, 2 mm. longis, obtusis vel rotundatis; staminibus 6, 3 brevioribus; filamentis glabris, ad 2 mm. longis; stylo filiformi, in fructu persistenti, glabro, 1-2 mm. longo; seminibus 4, oblongis vel quadrato-rhomboidalibus, griseo-brunneis, 1.25-1.5 mm. longis, 0.75- 1 mm. latis, uno latere plus minusve 12-scrobiculato, e contrario reticulato cicatrice hilari elongata.

Type in herb. Chi. Nat. Hist. Mus., collected between La Trinidad and headwaters of Río de Amana, Cerro Turumiquire, state of Sucre, alt. 1300-1800 m., May 10, 1945, *Julian A. Steyermark 62688.*

Known locally as "Suelda con suelda".

Characterized by the glabrous filaments, small white petals, tiny sparsely pilosulous sepals, small size of seeds, strongly inequilateral base of leaves, small bracts subtended on one side by a leaf, and short pedicels, this species is related to *Tradescantia commelinoides* Roem. & Sch. of Central America and Mexico. From this species, it differs, among other respects, in its white petals. It is related to *T. cymbispatha* Clarke, from which it differs in the much smaller seeds, more densely pubescent bracts, smaller petals and sepals, inequilateral leaves, shorter pedicels, and filaments all glabrous. From *T. anagallidea* Seub. and *T. fluminensis* Vell. it may be distinguished by the asymmetric narrowed leaf base, smaller flowers, shorter pedicels, and glabrous filaments.

LILIACEAE

Excremis coarctata (R. & P.) Baker, forma **alba** Steyermark, f. nov.

A typo recedit petalis albis.

Type in herb. Chi. Nat. Hist. Mus., collected on ascent of Pico de Naiguatá, above Los Chorros, state of Miranda, alt. 2200-2765 m., June 16-17, 1945, *Julian A. Steyermark 62963.*

This differs from typical *E. coarctata* in the white, instead of blue, petals.

Nietneria paniculata Steyermark, sp. nov.

Herba perennis; foliis erectis, caeruleo-viridibus, linearibus, falcatis, angustate acuminatis, firmiter 10-costulatis, 7-17 cm. longis, 1.5-3.5 mm. latis, vaginis equitantibus; inflorescentia paniculata, 1.5-7.5 cm. longa, 1.5-2 cm. lata, pedicellis 8-13 mm. longis, erectis; bracteis infimis 4.5-6 mm. longis; perianthio superne flavo, parte inferiore olivaceo-viridi, hypanthio late conico, 2 mm. longo, segmentis 5 mm. longis, exterioribus 1.5 mm. latis, interioribus 1.75-2 mm. latis, marginibus scariosis albidis 0.5 mm. latis, subaequalibus, lanceolatis, acutis, apice paullo incurvatis, 5-7-nervatis; filamentis subulatis, 3 mm. longis; antheris oblongis, 1.1 mm. longis; ovario late conico, 3 mm. longo sursum sensim angustato.

Tips of leaves long- or narrowly acuminate; the 2-3 bracts of the scape above the lowest foliaceous bract poorly developed and reduced in size; inflorescence elongated paniculate, the flowers rather remotely separated; perianth segments 6, the inner 5-7-nerved with scarious whitish margins, the outer 7-nerved; bracts at base of lowest flowering branches 4.5-6 mm. long; stigmas subcapitate; styles 1 mm. long.

Type in herb. Chi. Nat. Hist. Mus., collected in Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Julian A. Steyermark 59362.*

This is the second species to be described in the genus *Nietneria*, previously represented by the single species *N. corymbosa* Klotzsch & Schomb. of the Roraima region. It differs from that species in having a paniculate elongate instead of corymbose or subcorymbose inflorescence, the flowers more separated, much shorter bracts at the base of the lowest flowering branches, those in *N. corymbosa* being more foliaceous, 7-9 mm. long in anthesis and 16-20 mm. long in fruit, the tips of the leaves long- or narrowly acuminate, whereas in *N. corymbosa* they are short-acute to subacuminate, and finally in the middle and upper bracts of the scape, which in *N. corymbosa* are more foliose and better developed.

Smilax duidae Steyermark, sp. nov.

Frutex scandens ubique glaber; ramulis teretibus laevibus vel minute tuberculatis, inermis; petiolis crassis, 30 cm. longis basi dilatis; laminis coriaceis elliptico-oblongis, 20-21 cm. longis, 7-9 cm. latis, obtusis vel acutis, basi subacutis et in petiolum subito contractis, basi 5-nervatis, nervis extimis minus prominentibus; pedunculis umbellarum mascularum in racemis bracteatis ad 5.5 cm. longis dispositis; bracteis oblongis acutis, 5.5-6.5 mm. longis; pedunculis 20-23 mm. longis, paullo compressis; receptaculis masculis subglobosis 2 mm. diametro; floribus pallido-viridibus 21-23 per umbellam; pedicellis pallido-viridibus gracilibus 6-7 mm. longis; perianthii segmentis oblongis, 4.5-5 mm. longis, circiter 1.2 mm. latis, subacutis; staminibus perianthium aequantibus; filamentis 2.5 mm. longis; antheris lineari oblongis, 2.2 mm. longis.

Type in herb. Chi. Nat. Hist. Mus., collected on Cerro Duida, southeastern-facing forested sandstone slopes along Caño Negro (tributary of Caño Iguapo), Territorio Federal Amazonas, alt. 260-610 m., August 26, 1944, *Julian A. Steyermark 58057.*

This species resembles *S. pseudosyphilitica* Kunth in appearance, but differs in having larger staminate flowers, much longer peduncles, and longer pedicels. The general shape and large size of the leaves simulate those of *S. graciliflora* A. C. Smith and *S. grandifolia* Regel, but those species have aculeate stems.

From *S. immersa* A. C. Smith the new species may be distinguished by the larger 5-nerved leaves, longer peduncles and pedicels, and longer perianth segments.

Smilax Lasseriana Steyermark, sp. nov.

Caulis fruticosus teres striatus, tenuiter tuberculatus, ramulis novellis striato-angulatis minute tuberculatis, inermis, scabridulis; petiolis crassis, 5-7 mm. longis, apicem versus incrassatis et rugulosis; laminis coriaceis, supra lucidis, ovato-oblongis, 6-9 cm. longis, 3-5.5 cm. latis, basi subcordatis in petiolum subito contractis, apice obtusis breviter calloso-mucronulatis, e basi conspicue 3-5-nervatis, venis utrinque prominulis in rete grosso areolatum connexis; umbellis foemineis axillaribus; pedunculis foemineis

brevibus, 2-10 mm. longis, striatis; pedicellis foemineis 1 mm. longis, 0.6 mm. latis; perianthii segmentis anguste oblongis obtusis, exterioribus 1.8-1.9 mm. longis, 0.8-0.9 mm. latis, interioribus 1.5 mm. longis, 0.5 mm. latis, apice incurvato-cucullatis; stigmatibus brevibus, sessilibus, incrassatis, latioribus quam longioribus, 0.5 mm. altis; ovario 1.5 mm. longo.

Type in herb. Chi. Nat. Hist. Mus., collected on Sororopán-tepuí, crest of cerro between east and west end, state of Bolívar, alt. 2255 m., *Julian A. Steyermark 60121*, "sprawling over ground by wooded streamlet; stems wiry; leaves coriaceous, deep green both sides; flowers pale green."

This species is named in honor of Dr. Tobias Lasser of the Servicio Botánico of the Ministerio del Agricultura y Cria in Caracas.

In the obtusish, apiculate leaves and scabridulous stems this species resembles *S. rufescens* Griseb., from which it differs chiefly in the subsessile, pistillate peduncles and shining upper surface of the cordate or subcordate leaves. *Smilax viminea* Griseb. has subsessile peduncles, but much narrower leaves. *Smilax Williamsii* Macbr. has obtusish leaves, but non-scabrous, non-verrucose branches, and the reticulation of the upper surface of the leaf blades consists of smaller areolation.

Smilax Pittieriana Steyermark, sp. nov.

Frutex scandens ubique glaber; ramulis teretibus laevibus inermis; petiolis 1-1.5 cm. longis; laminis coriaceis oblongo-lanceolatis, 7-14 cm. longis, 1.5-5 cm. latis, acutis vel acuminatis, basi subacutis vel obtusis in petiolum contractis decurrentibus, e basi 3-5-nervatis, nervis extimis inconspicuis; pedunculis umbellarum masculorum axillaribus solitariis circiter 2.5 cm. longis, paullo compressis; receptaculis masculis subglobosis 2 mm. diametro; floribus viridescenti-flavidis, ca. 6 per umbellam; pedicellis masculis gracilibus 9-12 mm. longis, 0.4-0.5 mm. latis; perianthii segmentis linearioblongis obtusis subaequalibus, 5.2-5.3 mm. longis, 1.2-1.4 mm. latis, extus apicem versus et ad marginem parce et minute papillosotomentulosis, 1-nervatis; staminibus brevioribus quam segmentis; filamentis 2 mm. longis; pedicellis foemineis 6-7 mm. longis, 0.3-0.5 mm. latis; perianthii foeminei segmentis lineari-oblongis obtusis, 4 mm. longis, 1 mm. latis, extus apicem versus parce papillosotomentulosis; staminodiis 6, subulatis, 1.2 mm. longis, arcuato-adscendentibus; stylis 3, crassis, carnosis, oblongis, parte superiore tercero paullo constrictis 1-1.2 mm. longis; ovario 1.5 mm. long.

Type (staminate plant) in herb. Chi. Nat. Hist. Mus., collected in scrubby forest at margin of swampy meadow, vicinity of "Misia Kathy camp", on mesa between Ptari-tepuí and Sororopán-tepuí, state of Bolívar, alt. 1615 m., November 15-17, 1944, *Julian A. Steyermark 60251*; co-type (pistillate plant), same locality, *Steyermark 60251a*.

The dimorphous leaves of the pistillate and staminate plants are noteworthy, those of the staminate plants being broader. The older mature leaves of both sexes are non-reticulate and show immersed nerves, whereas the younger leaves of both sexes manifest a reticulate conspicuously nerved and veined appearance. In age, apparently, the leaves become much more coriaceous, and the veins become immersed on the upper leaf surface. On these older leaves usually just one main nerve stands out, the other lateral ones being only slightly evident.

This species is related to *S. immersa* A. C. Smith of British Guiana, the principal likeness being found in the nerves of the upper leaf surface becoming immersed in the leaf tissue of the older leaves. From this species it differs in its shorter petioles, smooth rather than minutely tuberculate branches, more narrowly lanceolate or oblong-lanceolate leaves, longer pedicels of the staminate flower, and staminate inflorescence composed of only one umbel.

Smilax staminea Griseb., f. **obtusata** Steyermark, forma nova.

A typo differt apice foliorum obtuso vel subobtuso; pedunculis foemineis axillaribus solitariis 2-4 mm. longis, 1.5 mm. latis; pedicellis bacciferis 5-6 mm. longis.

Stems striatulate, glabrous, unarmed; petioles thickened, 6-15 mm. long; leaf-blades deep green above, dull paler green below, ovate-oblong (older leaves) to narrowly oblong (those on lateral shoots), 6.5-11 cm. long. 2.5 cm. wide, shining above, conspicuously reticulate-veined on both sides, obtuse to rounded at base, obtuse or subobtuse at apex, 3-5-nerved from the base; fruiting peduncles short, solitary, 2-4 mm. long; fruiting pedicels 5-6 mm. long; berries pale green, 7-8 mm. in diameter.

Type in herb. Chi. Nat. Hist. Mus., collected on forested sandstone south-facing slopes between pleteau portion and "Cave Camp," Ptari-tepuí, state of Bolívar, alt. 1700-1800 m., November 1, 1944, *Julian A. Steyermark 59695.*

Tofieldia duidae Steyermark, sp. nov.

Herba caespitosa, foliis elongato-linearibus acicularibus, 5.5-14 cm. longis, 2-3 mm. latis, glabris, longitudinaliter 6-10-striatis, basi distiche vaginantibus; scapo erecto tereti, 13-25 cm. longo, glabro foliis longioribus, 2-6-floro; bracteis minutis; floribus strictis racemosis; pedicellis erectis, 8-12 mm. longis; involucello bracteolis late ovatis acutis 1.5-2 mm. longis; perianthii segmentis oblongo-lanceolatis acutis, 8 mm. longis, 1.75-2 mm. latis, 5-7-striatis; filamentis linearibus planis 2.7 mm. longis; antheris lineari-oblongis, 1.2 mm. longis, 0.5 mm. latis; stylis 3 coalitis, 1.5 mm. longis; stigmatibus 3 subcapitatis; ovario 3-lobato conico-oblongo 3.5 mm. longo apicem versus acuto, triloculari; ovulis 10 in quoque loculo.

Type in herb. Chi. Nat. Hist. Mus., collected along stream bank

above Vegas Falls, Brocchinia Hills, summit of Cerro Duida, Territorio Federal Amazonas, alt. 1700-1980 m., September 1, 1944, *Julian A. Steyermark 58176*; co-type in herb. N.Y. Bot. Gard., collected on rocks in streambed at Central Camp, summit of Mount Duida, alt. 1550 m., Dec. 20-28, 1928, *G. H. H. Tate 546*.

This species differs from *T. Schomburgkiana* Oliver, described from Mount Roraima, and with which it has been confused, by its glabrous, long-acicular leaves, smaller perianth, much more slender scape and pedicels, and the minute reduced bracts of the scape and at the base of the pedicels.

Tofieldia sessiliflora Hook., var. **robustior** Steyermark, var. nov.

A typo differt inflorescentia valde elongata, 20-28 cm. longa; seminibus 2-2.5 mm. longis.

Type in herb. Chi. Nat. Hist. Mus., collected in wet meadow at Las Sabanetas, above Los Aposentos, west of Humocaro Bajo, state of Lara, alt. 2530 m., February 5, 1944, *Julian A. Steyermark 55291*.

Known locally as "Barrita de San José".

This differs from typical *T. sessiliflora* in its much more elongated inflorescence and longer seeds.

AMARYLLIDACEAE

Pancratium Moritzianum (Kunth) Steyermark, comb. nov.

Hymenocallis Moritziana Kunth, Enum. Pl. 5: 668. 1850.

Stem ancipital; filaments green in upper half, white below; style dull green; all other parts white; segments recurved, 1/2 curved; leaves green above, pale below; cultivated at Mucuchachí, state of Merída, alt. 1065 m., May 4, 1944, *Steyermark 56319* (2 sheets).

VELLOZIACEAE

Vellozia duidae Steyermark, sp. nov.

Caudex erectus simplex subligneus 1.3-1.8 m. altus, 2.5-5 cm. diametro; foliis apicalibus subcoriaceis adscendentibus undique viridibus 45-50 cm. longis, 10-11 mm. latis, apicibus pendentibus, supra glabris, subtus subglabratis vel inter nervios minute pilosulis, marginibus basi adpresso-hirsutis.

Type in herb. Chi. Nat. Hist. Mus., collected on ridge top, Savana Hills, summit of Cerro Duida, Territorio Federal Amazonas, alt. 1025-1200 m., September 2, 1944, *Julian A. Steyermark 58270*, "stems 4-7 feet tall; leaves ascending with drooping tips, subcoriaceous, grass green both sides; stems subligneous, soft, 1-2 inches in diameter."

It is with hesitancy that a new species in this genus is described from a vegetative state only, but the plant from the summit of Duida differs vegetatively from other species as follows: the broader and longer leaves which are glabrous on the upper surface and only subglabrate to minutely pilosulous in the sulcations between the nerves on the lower surface, the appressed-hirsute basal margins of the leaves, and the relatively tall thick stems which vary from 1.3-1.8 meters in height.

Vellozia duidae is locally common in the Savana Hills, and forms a striking appearance with its tall subligneous stems giving rise at the tip to the long leaves. These stems are much taller than in *V. tubiflora* H.B.K. of the lowlands of the Upper Orinoco in Venezuela, and have much broader and longer leaves than either *V. tubiflora* or *V. Alexandrinae* (Schomb.) Goeth. & Henr. of the Gran Sabana region bordering Roraima, Auyan-tepuí, and Ptari-tepuí. In those species, moreover, and especially in *V. Alexandrinae*, the leaves are densely appressed-silvery-sericeous-pubescent beneath. The chances are great that *V. duidae*, geographically isolated as it is on the summit of Duida, will be found to possess additional characters as a distinct species when its flowers are eventually collected and described.

DIOSCOREACEAE

Dioscorea bolivarensis Steyermark, sp. nov.

Caules teretes, glabri; laminis membranaceis cordato-ovatis acuminatis, 4-6 cm. longis, 3-3.5 cm. latis, 7-nervatis glabris; petiolis 1.5-1.8 cm. longis; paniculis masculis paniculato-ramosis, 10-15 cm. longis; racemulis 2.5-3.5 cm. longis; floribus plerumque binis vel trinis fasciculatis pedicellatis; pedicellis 1-2 mm. longis glabris; bracteis ca. 1 mm. longis ovatis acuminatis; perianthio 2 mm. lato rotato; segmentis lineari-oblongis 1.5 mm. longis, 0.5-0.8 mm. latis, tubo brevi; staminibus fertilibus 6, perianthii tubo insertis; filamentis elongatis.

Type in herb. Chi. Nat. Hist. Mus., collected along rocky cascades of Río Upata, west of Upata, state of Bolívar, alt. 500 m., July 31, 1944, *Julian A. Steyermark 57551.*

The paniculately branched staminate inflorescence relates this species to section *Sarcantha* Uline, as treated by R. Knuth in Das Pflanzenreich (IV. **43**: 247. 1924), and to *D. amazonum* Griseb. in that section, but that species has very elongated staminate branches of the inflorescence and the flowers are solitary, whereas in *D. bolivarensis* the flowers are in pairs or in cymules of threes, and much smaller.

Dioscorea Lasseriana Steyermark, sp. nov.

Caules usque 2.5-3 mm. crassi, hirtello-pubescentes, pilis patulis obsiti; laminis firmiter papyraceis ovato-oblongis, cordato-ovatis

vel subrotundatis, apice subiter cuspidatis, basi sinu latissimo cordato, adultis 8.5-10 cm. longis, 5.5-9 cm. latis, subtus villosis, supra glabris, 7-9-nervatis, venis prominente reticulatis, praesertim subtus; petiolis 3-4 cm. longis hirtellis; racemis masculis fasciculatis pluribus in axilla folii, usque 15-20 cm. longis, 1-1.5 mm. crassis, villosis, rhachi et floribus et pedicellis villosis; fasciculis subsessilibus 1-1.5 mm. longis, 2-4-floris; pedicellis 3-6 mm. longis, villosis, perianthio 1.8-2 mm. longo, villoso, usque ad 4/5 partito; segmentis lanceolato-oblongis, obtusis, extus villosis; staminibus 6, centralibus; filamentis recurvatis, basi in tubum coalitis; antheris suborbicularibus brevioribus quam filamentis.

Type in herb. Chi. Nat. Hist. Mus., collected on meadowy slopes between La Sabana de las Piedras and Cerro Negro, northwest of Caripe, state of Monagas, alt. 1200-1500 m., April 5, 1949, *Julian A. Steyermark 61836*; also collected in woods above Las Cuadras, along Quebrada Molino, north of Torondoy, state of Mérida, alt. 1820-2255 m., March 27, 1944, *Steyermark 55802*.

A member of subgenus *Helmia* (Kunth) Benth., sect. *Dematostemon* Griseb., as treated by R. Knuth in Das Pflanzenreich IV. **43**: 50-51. 1924, this species, because of its staminate flowers villous on the outer surface, is related to *D. Fendleri* R. Knuth of Venezuela, but differs from that species in having villous stems and the lower surface of the leaves villous. It is also closely related to *D. sericea* R. Knuth of Colombia, from which it differs in the much longer pedicels of the staminate flowers, the acuminate or cuspidate leaf-tips, and the loosely villous instead of villous-sericeous pubescence of the lower surface of the leaves.

Dioscorea sororopana Steyermark, sp. nov.

Volubilis glabra; caulibus tenuibus subteretibus; foliorum laminis firmiter membranaceis vel subcoriaceis late ovatis, subito acuminatis, basi sinu latissime cordato, adultis 4-8 cm. longis, 3.5-6 cm. latis, glabris, 7-13-nervatis, nervis extremis furcatis, subtus conspicuoribus et laxe areolatis; petiolis 1.5-4 cm. longis; inflorescentia mascula spicata; spicis masculis simplicibus solitariis vel 2-fasciculatis, 8-9 cm. longis, glabris angulatis, longioribus quam foliis; floribus masculis 2-3-glomerulatis, sessilibus; glomerulis 1-3 mm. remotis; bracteis ovatis cuspidatis, 2.5 mm. longis; perianthio masculo campanulato, 2-2.5 mm. longo, segmentis subaequalibus, suborbiculari-ovatis, rotundatis vel obtusis, 1.5 mm. longis, 0.75-1 mm. latis, paullo longioribus quam tubo; staminibus 3, tubi fundo insertis, subcentralibus erectis, 1 mm. longis; filamentis 0.7-0.8 mm. longis; spicis fructiferis 10 cm. longis, 4 capsulas gerentibus; capsulis suborbicularibus vel subreniformibus 17-18 mm. longis, 18-19 mm. latis; seminibus undique alis circumcinctis, 9 mm. longis, 5-6 mm. latis, late oblongis, semine ipso suborbiculari 3-4 mm. longo.

Type in herb. Chi. Nat. Hist. Mus., collected by wooded streamlet,

crest of cerro between east and west end, Sororopán-tepuí, state of Bolívar, alt. 2255 m., November 14, 1944, *Julian A. Steyermark 60124* (staminate plant); same locality *Steyermark 60143* (pistillate plant), co-type.

By having the seeds winged all around, this species would fall into subgenus *Eudioscorea*, according to R. Knuth's treatment of the genus in "Das Pflanzenreich". It is characterized by the 3 short fertile stamens without staminodia in the staminate flowers, the broadly suborbicular, rounded or obtuse staminate perianth segments, the fasciculate, sessile staminate flowers, the capsule as broad as or slightly broader than long, and the relatively small, broadly ovate, heart-shaped leaves with a conspicuous reticulum of nerves beneath.

It may be considered a member of the sect. *Hemidematostemon* Griseb., the known species of which are all Brazilian, but does not agree with any of the described species of that section.

IRIDACEAE

Trimezia Fosteriana Steyermark, sp. nov.

Herba perennis, ex cormum oriunda; scapo erecto subcomplanato simplici glabro, 60-75 cm. alto, bi- vel tri-foliato, bracteis subfoliosis remotis, 5-13 cm. longis; foliis radicalibus elongatis erectis glauco-viridibus subcoriaceis conspicue striatis linearibus, 30-65 cm. longis, 5-8 mm. latis, apice obtusis et asymmetricis; spatha terminali sessili 1-3-flora bivalva; valvis inaequalibus pedicellum subaequantibus striatis late lanceolatis carinatis 3.5-4.5 cm. longis, 8-10 mm. latis, acutis vel acuminatis, exteriore interiorem basi amplectenti; floribus aureo-purpureo-maculatis; perigonii laciniis 2.5 cm. longis, exterioribus patentibus, interioribus minoribus sursum arcuatis; stylo 13 mm. longo trigono tripartito, laciniis triangulatis aureo-flavidis 4 mm. longis, uno angulo ad duas margines late alato; stigmatibus bifidis lobatis vel crenatis, dentibus obtusis; staminibus styli ramulis oppositis et adnatis; filamentis liberis aureo-flavidis 4 mm. longis; antheris 6 mm. longis, apice apiculatis, juxta longitudinem dehiscentes; ovulis in loculis plurimis.

Type in herb. Chi. Nat. Hist. Mus., collected along Río Tek-Yunsén, between Santa Teresita de Kavanayén and Carrao-tepuí, state of Bolívar, alt. 1375 m., December 4, 1944, *Julian A. Steyermark 60834*; sandy wet ground with *Stegolepis* and *Brocchinia*, Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mesa, state of Bolívar, alt. 1220 m., October 26, 1944, *Steyermark 59364*.

This species is named in honor of Dr. Robert C. Foster of the Gray Herbarium of Harvard University. His studies of tropical American Iridaceae in recent years have done much to further our taxonomic knowledge of this family.

The long basal, closely ribbed, narrow leaves, foliose flowering scapes, and yellow perianth segments, of which the inner ones are spotted purple, distinguish this species. According to Dr. Foster, who has examined my material, "this species represents a transition between the rather broad, flat, thin leaves of *T. martinicensis* (Jacq.) Herb. and its allies, and the rigid, terete, thick leaves of the *Lansbergia*-group, exemplified by *T. juncifolia* (Klatt) Benth. & Hook."

MUSACEAE

Heliconia Schneeana Steyermark, sp. nov.

Planta 3 m. alta; foliorum laminis utrinque pallido-viridibus anguste oblongis, apice subito acuminatis; inflorescentia in scapo aphyllo foliorum vaginis inferne abscondito terminali, erecta; rhachidi inflorescentiae conspicua, flexuosa; rhachidis internodiis 3-6 cm. longis, in sicco 4-5 mm. crassis, dense brunneo-villosulis; bracteis spathaceis rubris 8, elongato-lanceolatis, e basi latioribus, apice acutis 12-19 cm. longis, 1-1.5 cm. latis, reclinatis vel reflexis, dorso inferne praesertim tomentosis; bractea infima fertili elongata, 38 cm. longa, lamina parva instructa; floribus in axillis spatharum, fasciculatis perpluribus pedicellatis ovario longioribus; bracteis membranaceis lanceolatis acuminatis, 4.5-5 cm. longis, 1-1.3 cm. latis, glabris; pedicellis flavidis 1.5-3 cm. longis, dense brunneo-villosulis; tepalis 4-4.5 cm. longis, glabris, basi viridescenti-flavidis superne pallido-viridibus; filamentis pallido-flavidis; ovario basi flavido, superne viridi.

Type in herb. Chi. Nat. Hist. Mus., collected in forest above Hacienda Agua Blanca, above La Azulita, state of Mérida, alt. 1310-1340 m., April 25, 1944, *Julian A. Steyermark 56083* (3 sheets), "stems 10 feet tall; flowers among upper leafy shoot part; bracts pointing downward, deep red; pedicel yellow; ovary yellow at base, green in upper half; filaments pale yellow; leaves pale dull green both sides."

This species is characterized by the strongly reflexed or downward-pointing, narrowly elongated linear-lanceolate bracts of the inflorescence, the flexuose densely villosulous rachis, the densely villosulous pedicels, and the erect inflorescence.

It is named in honor of Dr. Ludvig Schnee of Caracas, who, for many years, has studied and published on various groups of Venezuelan monocotyledons.

MARANTACEAE

Calathea acuminata Steyermark, sp. nov.

Planta 35-40 cm. alta; foliis ad 18 cm. longe petiolatis, petioli parte superiore ad 4-5 mm. longa tereti callosa supra minutissime

pilosa; laminis inaequilateralibus elliptico-lanceolatis vel anguste oblongo-ellipticis acuminatis basi acutis membranaceis, utrinque glabris, 13-20 cm. longis, 2.7-3.3 cm. latis; vaginis membranaceis praesertim supra minute adpresso-puberulis; spicis ellipsoideo-ovatis, 3 cm. longis; pedunculis gracilibus striatulis glabris vel minute adpresso-puberulis; bracteis 3-4, late ovatis acuminatis, 2.2-3.7 cm. longis, 1.2-1.8 cm. latis, praesertim infra minute puberulis; sepalis ellipticis 11-12 mm. longis; corolla alba, tubo 15 mm. longo.

Type in herb. Chi. Nat. Hist. Mus., collected en las sabanetas, a lo largo de los caminos en sitios poco húmedos, Capihuara, Alto Casiquiare, Territorio Federal Amazonas, alt. 120 m., May 24, 1942, *Llewelyn Williams* 15532, "hierba hasta de 40 cm. con flores blancas"; en los sitios poco húmedo en la selva, San Carlos de Río Negro, Territorio Federal Amazonas, alt. 100 m., February 28, 1942, *Llewelyn Williams 14515*, "hasta de 30 cm. de alto; flores blancas".

This species apparently is a member of subgenus *Microcephalum* Benth. as treated by K. Schumann in "Das Pflanzenreich" IV. **48**: 111. 1902. It differs from all other members of this subgenus, however, in its larger flower with longer corolla tube measuring at least 15 mm. long. It is further characterized by having few (3-4) long, acuminate bracts, which are minutely puberulous, especially at the base, and the narrowly elliptical, long-acuminate leaves.

From *C. Baraquinii* (Verschaff.) Reg. it differs in the much longer petioles, which are glabrate or minutely pilosulous, larger spikes, glabrate to minutely puberulent peduncles, and longer corolla tube.

Calathea duidae Steyermark, sp. nov.

Planta acaulis; scapis e basi plantae emittentibus a foliis discretis; foliis basalibus subcoriaceis inaequilateralibus, late ovatis vel suborbiculari-ovatis subito mucronatis, basi truncatis vel rotundatis, 42 cm. longis, ad 36 cm. latis, glabris; scapis saltem 45 cm. longis, in sicco 6-8 mm. crassis, dense adpresso-puberulis, supra velutinis; spicis obovoideo-subglobosis, apice rotundatis basi obtusis vel rotundatis, 9.5-10 cm. longis, ad 10 cm. latis; bracteis omnino fertilibus spiralibus, orbiculatis, apice rotundatis, plerumque fenestralibus tenuibus plurimis, 4-5 cm. longis, 3-4 cm. latis, extus puberulis, praesertim infra; floribus non visis; capsulis trilocularibus, apice truncato-depressis, extus parce puberulis, 15 mm. longis, 11 mm. crassis; seminibus 3, arillosis, uno solum maturescentibus, obtuse subtrigonis, seminis corpo nigro 9 mm. longo, 7 mm. crasso, arillo brunneo 3 mm. longo, 5 mm. lato.

Type in herb. Chi. Nat. Hist. Mus., collected between Sabana Grande and Base River (Caño Negro), at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 210 m., August 23, 1944, *Julian A. Steyermark 57888*, "flowering stems arising from base of plant; leaves subcoriaceous, deep green above, dull green below; bracts lace-like, dull brown; fruit orange."

Locally known as "Bijau", the leaves of this plant are reported to be used in wrapping a type of tamale here called "hallaca".

The fruiting bracts with their fine lacy network impart to this species a most unusual aspect. If they are a normal and natural feature, then the species may be considered as the most extraordinary one of the genus. Examination by high power microscope reveals that the skeletal tissue is a left-over one, originally covered by parenchymatous cellular tissue. However, the parenchyma appears to be very thin, whereas the fibro-vascular network accounting for the unusual lace-like skeleton of the bracts, is exceptionally strong and persists in fruit as the characteristic gross morphological feature of the bract.

The species is further distinguished by the densely, fine pubescent naked flowering scape arising at the base of the plant, the large broadly orbicular bracts, in which at least the lowest ones are villosulous on the outer surface, the large inflorescences, and the large orbicular-ovate or broadly ovate leaves.

Calathea Lasseriana Steyermark, sp. nov.

Folia ad 22 cm. longa; petiolis longissime vaginatis fere ad articulum, vaginis membranaceis infra medium 8 mm. latis, petioli parte superiore 5-6 mm. longa, 4-5 mm. crassa, subtereti callosa, supra pilosulis; laminis inaequilateralibus supra viridibus infra argenteo-viridibus membranaceis obovato-ellipticis abrupte et breviter acuminatis, basi obtusis, 20-30 cm. longis, 8-16 cm. latis, glabris; inflorescentia sessili terminali, inferne foliorum basibus cincta; spica anguste ovata, 3.5 cm. longa; bracteis 2.5-3 cm. longis, circum apicem minute puberulis, aliter glabris; floribus pallido-flavidis; sepalis linearibus obtusis, 11-12 mm. longis, 1.5 mm. latis, glabris; corollae tubo cylindrico, 12 mm. longo, 1.5 mm. crasso, pubescenti pilis adscendentibus; lobis exterioribus oblanceolatis, acutiusculis, 9 mm. longis, 3 mm. latis; ovario glabro.

Type in herb. Chi. Nat. Hist. Mus., collected in forest near Base River (Caño Negro), at southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 215 m., August 23, 1944, *Julian A. Steyermark 57920*, "terrestrial; flowers creamy-yellow; leaves silvery gray green below, rich deep green above with sulcate nerves."

This species is apparently related to *C. mishuyacu* Macbr., known only from near Iquitos, Peru. Our collection differs from the type of that species (*Klug 416*) in its sessile, instead of subsessile inflorescence, broader more membranous sheaths of the petioles, the sheaths of the petioles extending to the junction of the leaf blade instead of ending below the callus as in *C. mishuyacu*, the shorter broader callus at the top of the petiole, the leaf blades more rounded at the base, and the shorter bracts.

It is also related to *C. propinqua* (Poepp. & Endl.) Koernicke of Surinam and Brazil, and to *C. exscapa* (Poepp. & Endl.) Koernicke

of Peru. From the former it differs in the sheaths of the petioles extending all the way to the junction with the blade, the callus portion at the base of the blade not pubescent, the more rounded base of the leaf blades, the glabrate bracts, and the smaller flowers.

Ischnosiphon Lasseriana Steyermark, sp. nov.

Herba erecta stricta; caulibus minute verruculoso-tuberculatis, supra medium 0.5 cm. crassis; petiolis ad articulum vaginatis, articulo 7-9 mm. longo plerumque glabro, vaginis 6-6.5 cm. longis, glabris; laminis inaequilateralibus utrinque viridibus ovatis acuminatis, basi rotundatis, 8.5-13 cm. longis, 2.8-3.8 cm. latis, glabris; racemis solitariis.

Type in herb. Chi. Nat. Hist. Mus., collected in lower portion of Quebrada O-paru-má, tributary of Río Pacairao, below Santa Teresita de Kavanayén, state of Bolívar, alt. 915-1065 m., November 15, 1944, *Julian A. Steyermark 60557.*

Local name: "Curarimá-yek".

This species is related to *I. surinamensis* (Miq.) Koernicke of the Guianas and Brazil, and to *I. verruculosus* Macbr. of Peru. In its solitary spikes it resembles the former, but differs from that chiefly in the verruculose stems, while from the latter it may be distinguished by the smaller leaves, and by the more finely verruculose stems, the projections being closer together and less conspicuously raised above the surface of the stem.

Monotagma duidae Steyermark, sp. nov.

Herba erecta metralis; foliis longe petiolatis, articulo subtereti 0.8-6.5 cm. longo, glabro vel pubescenti; vaginis basi vel interdum superne dense strigillosis; laminis infra cinereo-viridibus interdum atro-viridibus lineatis, inaequilateralibus ovato-lanceolatis, acuminatis basi obtusis, 32-45 cm. longis, 11-15 cm. latis, supra ad costam mediam plus minusve dense hirtello-pubescentibus, interdum ad superficiam leviter puberulis, aliter glabris; inflorescentia terminali, folio frondoso suffulta; paniculis congestis ovoideis vel ovato-ellipticis, 10-13 cm. longis, 6-8 cm. latis; bracteis subcoriaceis pallido-viridibus vel cupreis suffusis, 2.2-2.4 cm. longis, strigillosis; floribus blancis, roseo-suffusis; bracteolis membranaceis ovato-lanceolatis subacutis, 7 mm. longis; sepalis lineari-spatulatis, obtusis 5 mm. longis, 1 mm. latis; corollae tubo 1.5-2 cm. longo; lobis 5-6 mm. longis, 3 mm. latis, lobo exteriori anguste spatulato, 7 mm. longo; staminodio exteriori calloso 4 mm. longo; anthera late obovato-oblonga; filamento late lineari.

Type in herb. Chi. Nat. Hist. Mus., collected in second woodland after crossing Esmeralda Ridge on way to Duida, between Esmeralda Savana and southeastern base of Cerro Duida, Territorio Federal Amazonas, alt. 200 m., August 22, 1944, *Julian A. Steyermark 57807*, "leaves in rosette from cluster on stems; staminodia pale rose at

base, rest of petals white; bracts pale green; leaves grass dull green above, gray green below with dull dark green lines"; forest along Base River (Cãno Negro), at southeastern base of Cerro Duida, alt. 225 m., August 23, 1944, *Steyermark 57927*, "herb in dense clump, 3 feet tall; leaves gray green below, deep green above; bracts brick-colored above; flowers white with rose-salmon"; San Carlos, Río Negro, Territorio Federal Amazonas, alt. 100 m., 1942, *Llewelyn Williams 14243*.

This species is characterized by the combination of the short, dense inflorescence, strigillose bracts, relatively short sepals and corolla parts, densely puberulent upper portion of the petioles, and minutely puberulent midrib of the upper leaf surface.

It is related to *M. laxum* (P. & E.) Schum. and *M. exannulatum* Schum., from which it differs in the shorter sepals, abbreviated, shorter inflorescence, strigillose bracts, finely puberulous upper portion of the petiole, and puberulous midrib of the upper leaf surface. *Williams 14243* has the leaf surface and petioles more pubescent than the other two collections cited, but is apparently the same in all other respects.

BURMANNIACEAE

Burmannia sanariapoana Steyermark, sp. nov.

Caules erectes simplices vel ramosi, 11-23 cm. alti, inferne foliolosi, superne parce bracteosi; foliis 5-6, infimis ovato-lanceolatis, 3-5 mm. longis, caulinis lineari-lanceolatis vel lanceolatis, subulatis squamiformibus, caulem vaginantibus, 5-12 mm. longis, 0.5-1.5 mm. latis, prominenter uninerviis; bracteis caulinis adpressis remotis oblongo-lanceolatis, acutis, 3-5 mm. longis; floribus in racema capituliformi vel in cyma dichotoma secundis subsessilibus bracteatis; bracteis elliptico-oblongis, 1 mm. longis, 0.5 mm. latis; ovario 1.3 mm. longo; perianthio obconico triquetro purpureo, apice pallidiori et viridi, superne alato, tubo triangulari 2-3.5 mm. longo, lobis exterioribus ovatis 1-1.3 mm. longis erectis alatis vel cristatis, supra marginibus inflexis apice cucullatis, lobis interioribus linearispatulatis vel anguste oblongo-linearibus, rotundatis, 4 mm. longis; staminibus sessilibus, infra bases loborum interiorum insertis, connectivo ellipsoideo, 2 cristis apicalibus sublanceolatis; antheris reniformibus; stylo cylindrico-filiformi; stigmatibus divaricatis infundibuliformibus cristatis (Fig. 24).

Type in herb. Chi. Nat. Hist. Mus., collected in vicinity of Sanariapo, near Río Sanariapo, tributary of Orinoco river, Territorio Federal Amazonas, alt. 100 m., September 8, 1944, *Julian A. Steyermark 58466*, "flowers purple with paler lavender and greenish at tip".

This species is related to *B. dasyantha* Mart. of Brazil, but has smaller flowers and shorter and more scale-like leaves than that

species. It is intermediate between *B. capitata* (Walt.) Mart. forma *bracteosa* (Gleason) Jonk. and *B. dasyantha*.

FIGURE 24

Burmannia sanariapoana Steyermark.

A, Portion of inflorescence (X 5); B, Flower and bracts (X 5); C, One of inner and outer perianth lobes from within, and attached stamen (X 18); D, Outer perianth lobe with crest, lateral view (X 18); E, Stamen (highly magnified); F, Upper part of style with stigmas (highly magnified).

ORCHIDACEAE[12]

Pogonia stricta C. Schweinfurth, sp. nov.

Herba terrestris, gracilis. Caulis sparsim ramosus, cum ramis strictis paucifloris, sine foliis sed minute bracteatus. Racemi bi-vel quadriflori. Flores lateraliter visi arcuati. Sepala carnosa. Sepalum dorsale fornicatum, longitudinaliter concavum, lanceolato-oblongum. Sepala lateralia arcuato-falcata, caetera similia. Petala elliptico-oblonga, leviter falcata, quam sepala paulo breviora sed latiora. Labellum tubulari-involutum, simplex, lanceolato-oblongum, obtusum; discus basi minute bicallosum, cum fascia lata carnosa minute multipapillosa per medium. Columna apice dilatala, ala conspicua terminata.

Plant terrestrial, very slender, at least 23 cm. high (up to the apex of the raceme) in the only complete plant present. Stem with 1 to several strict and more or less remote branches, produced below into an irregularly flexuous villous portion, leafless, provided remotely with minute appressed, triangular-ovate and acute or narrowly triangular-lanceolate and acuminate bracts which are 10 mm. or less long; branches short, 2- to 4-flowered, rarely up to 7.8 cm. long. Floral bracts strict, triangular-ovate, deeply concave, acuminate. Flowers small, narrowly campanulate and arcuate when seen from the side in natural position. Sepals fleshy, longitudinally concave, greenish yellow. Dorsal sepal fornicate, lanceolate-oblong, acute, apiculate, up to about 20 mm. long and 4 mm. wide when expanded, dorsally lightly carinate. Lateral sepals oblique and falcate, lanceolate-oblong, acute, about 20 mm. long and 4.8 mm. wide, dorsally carinate. Petals similar to the lateral sepals, elliptic-oblong, falcate, acute, up to 18 mm. long and 5 mm. wide, 3-nerved (or 5-nerved in the middle), with minutely irregular margins, creamy yellow. Lip tubular-involute in natural position, simple, lanceolate-oblong, obtuse, up to about 16.3 mm. long and 6.2 mm. wide below when expanded, with the lateral margins toward the apex minutely erose and crisped-undulate; disc minutely bicallose at base, with a broad central oblong-lanceolate acuminate fleshy band (entirely covered by crowded papillose keels) extending from the base nearly to the apex. Column small, from a slender base rather abruptly dilated above, terminating in a prominent triangular blunt wing which is lacerate on each side below, about 8 mm. or less high at the back (Fig. 25).

Type in herb. Chi. Nat. Hist. Mus., no. 1203783, isotype in Herb. Ames, no. 64865, *Brocchinia-Stegolepis-Heliamphora* swamp on southwest-facing shoulder, Ptari-tepuí, state of Bolívar, alt. 2200 m., November 2, 1944, *Julian A. Steyermark 59786*, "lateral sepals with pale greenish in center, lip creamy white with rose-lavender or magenta".

[12]By Charles Schweinfurth

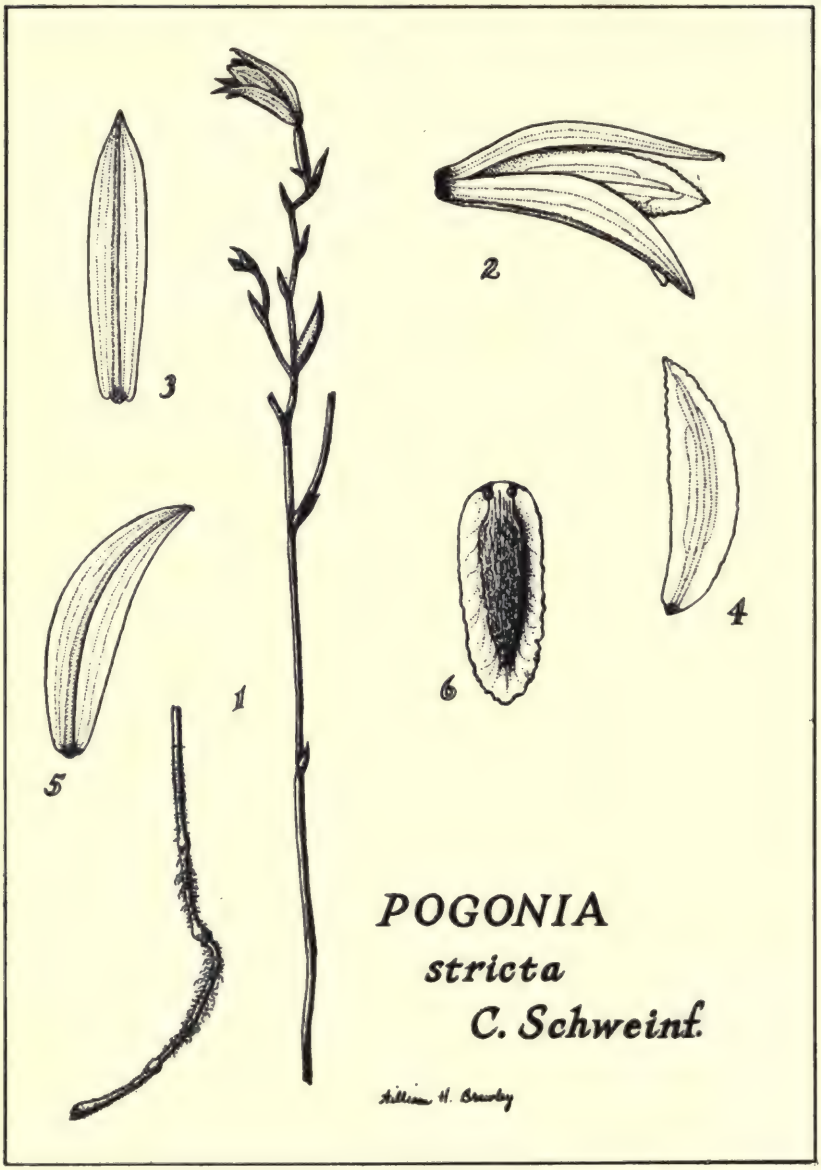

FIGURE 25

Pogonia stricta. 1, Plant (X 4/5); 2, Flower from the side (X 2); 3, Dorsal sepal (X 2); 4, Petal (X 2); 5, Lateral sepal (X 2); 6, Lip, from above (X 2).

This species is apparently allied to *Pogonia paludosa* Reichb. f., but is dissimilar in having branched stems, short floral bracts and differently colored flowers with a dissimilar lip.

Pogonia triflora C. Schweinfurth, sp. nov.

Herba terrestris, gracilis. Caulis basi excepta glaber, parte inferiore remote bivaginata, parte superiore remote bifoliata. Folia parva, stricta, amplexicaulia; folium basale anguste ellipticum et acutum; folium superius lineari-lanceolatum et acuminatum. Racemus perlaxe triflorus cum bracteis floralibus conspicuis, strictis, lanceolatis vel ovato-lanceolatis, acuminatis. Flores parvi, rosei. Sepalum dorsale fornicatum, expansum anguste oblongo-lanceolatum, acutum. Sepala lateralia expansa similia. Petala sepalis similia sed paulo breviora et latiora, cum marginibus superioribus leviter et irregulariter denticulatis. Labellum expansum anguste oblongo-ovatum, prope apicem trilobatum; lobi laterales apice abrupte angulati; lobus medius triangulari-ovatus; discus fascia mediana lata percursus, basi minute bicallosus. Columna gracilis, perianthii segmentis distincte minor.

Plant terrestrial, slender. Stem glabrous except at the very base which is apparently lanuginose, provided in the lower portion with two remote ovate or ovate-oblong amplexicaul sheaths and above with two remote leaves, about 19 cm. high up to the base of the floriferous portion. Leaves two, appressed, amplexicaul, narrowly elliptic or linear-lanceolate, acute or acuminate, the upper and larger blade about 3.6 cm. long and 6 mm. wide. Raceme very loosely 3-flowered, with the rachis about 5 cm. long. Floral bracts conspicuous, strict, lanceolate (lowermost) to ovate-lanceolate, acuminate, amplexicaul, deeply concave, the lowermost about 3.2 cm. long and 9 mm. wide. Flowers rather small, "rose-orchid", apparently nodding in age. Segments membranaceous. Dorsal sepal fornicate in natural position, when expanded narrowly oblong-lanceolate, acute, about 2.4 cm. long and 5 mm. wide. Lateral sepals closely similar. Petals similar to the sepals but slightly shorter and broader, about 2.2 cm. long and 6 mm. wide, with the upper margins lightly and irregularly denticulate. Lip deep rose, when expanded oblong-ovate in outline, distinctly 3-lobed near the apex, about 2.25 cm. long and 9 mm. wide; lateral lobes with abruptly angulate obtuse, spreading tips; mid-lobe small, triangular-ovate; disc traversed by a broad median thickened band (with irregular margins) which extends from the base about to the middle of the mid-lobe, minutely bicallose at the base. Column, slender, slightly dilated upward, about 1.6 cm. long (Fig. 26).

Type in herb. Chi. Nat. Hist. Mus., no. 1203772, southwest-facing slopes between base of mountain at Quebrada Ka-hua-parú and Glycon swamp, Mount Roraima, state of Bolívar, alt. 1220-1980 m., October 1, 1944, *Julian A. Steyermark 59014.*

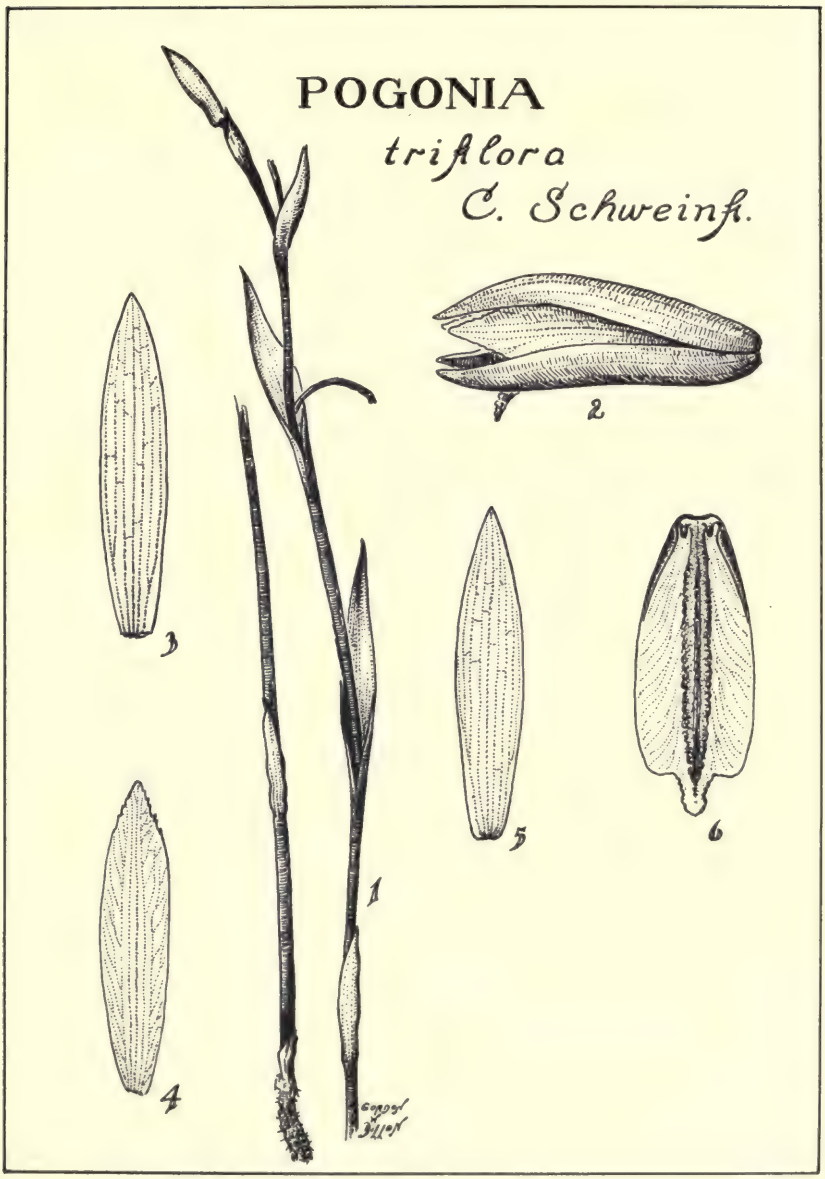

FIGURE 26

Pogonia triflora. 1, Plant (X 4/5); 2, Flower from the side (X 2); 3, Dorsal sepal (X 2); 4, Petal (X 2); 5, Lateral sepal (X 2); 6, Lip, from above (X 2).

This species appears to be similar to *Pogonia tenuis* Reichb. f., but differs in having longer floral bracts, larger rose-colored (not white) flowers and acute (not acuminate) sepals. It seems to be allied to *P. elegantula* Schltr., but has much smaller, narrower leaves.

Pogonia unifoliata C. Schweinfurth, sp. nov.

Herba terrestris, minor. Caulis gracilis, ima basi dense villosus, supra glaber, unifoliatus. Folium anguste ellipticum, acutum, sessile, amplectens, erectum. Flos singulus, bracteatus. Sepala lanceolato-oblonga, acuta, tubulari-involuta. Petala elliptico-oblonga, paulo breviora, tenuiora. Labellum expansum oblongo-ellipticum, prope apicem profunde trilobatum; lobi laterales involuti, cum apice libero brevi rotundato vel obtuso; lobus medius comparate parvus, in circuitu naturali triangularis, expansus suborbiculari-obovatus; discus basi minute bicallosus, fascia mediana late percursus. Columna brevis, supra sensim dilatata.

Plant terrestrial, rather small. Stem slender, up to about 20 cm. long, densely brown-villous at the base (doubtless where in contact with the soil), glabrous above, blue-gray and glaucous, furnished in the lower third with a minute ovate-lanceolate amplexicaul sheath and in the upper third with a single leaf. Leaf erect, narrowly elliptic, acute, sessile, amplexicaul, blue-gray, glaucous, about 2.8 cm. long and 8 mm. wide. Inflorescence 1-flowered, leafy bracted. Bract similar to the leaf, ovate-elliptic, amplexicaul, acute, deeply concave and clasping the flower, about 2.5 cm. long, with the tip little shorter than the floral segments. Ovary slender, plurisulcate, glabrous. Flower small, apparently a bud. Sepals parallel, fleshy, pale yellow-green, glaucous, tubular-involute. Dorsal sepal lanceolate-oblong, acute, 7-nerved, about 14.5 mm. long and 4 mm. wide when expanded. Lateral sepals similar, slightly shorter and narrower, slightly oblique, 5-nerved. Petals elliptic-oblong, acute or subacute, about 13 mm. long and 4 mm. wide, thinner than the sepals, pale green, 3-nerved through the middle with lateral nerves branching. Lip oblong-elliptic in natural position, deeply 3-lobed near the apex, about 12.5 mm. long and 5.8 mm. wide when expanded, pale greenish white with purple lines; lateral lobes inrolled with short rounded or obtuse free apex; mid-lobe very small, triangular in natural position with involute sides, when expanded suborbicular-obovate with crenate margins; disc through the middle with a broad fleshy band (longitudinally divided above) extending from near the base about to the middle of the mid-lobe, minutely bicallose at the base. Column short, gradually dilated upward, white at base with wine-purple near tip, about 7.1 mm. tall at the back including the large erect anther (Fig. 27).

Type in herb. Chi. Nat. Hist. Mus., no. 1203948, scrubby forest on rocky open portion of plateau on southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59630.*

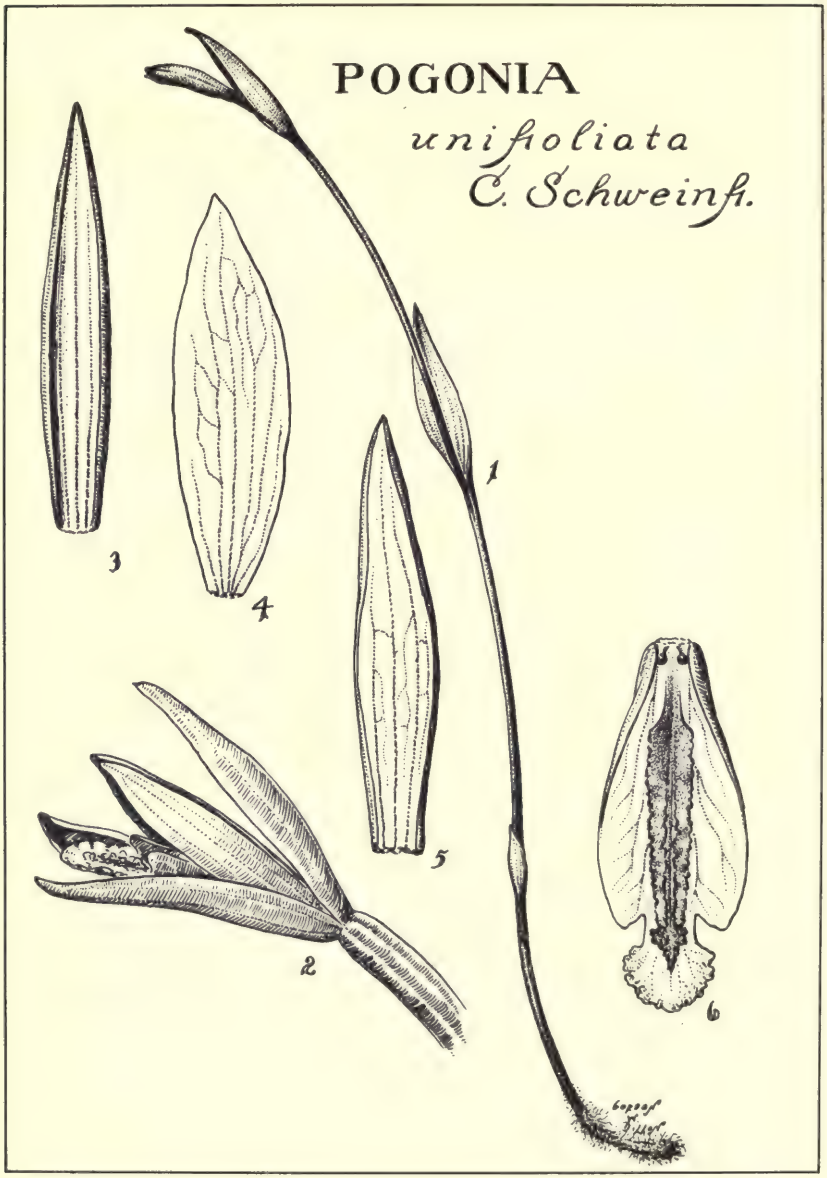

FIGURE 27

Pogonia unifoliata. 1, Plant (X 4/5); 2, Flower from the side (X 3); 3, Dorsal sepal (X 4); 4, Petal (X 4); 5, Lateral sepal (X 4); 6, Lip, from above (X 4).

This species does not appear to have any near ally, but it recalls a small form of the North American *Pogonia ophioglossoides* (L.) Ker-Gawl.

Prescottia carnosa C. Schweinfurth, sp. nov.

Herba terrestris, stricta; pro genere mediocris. Folia tria, basalia, prominenter petiolata; lamina ovata, acuta, basi rotundata vel subtruncata, valde coriacea. Scapus glaber, remote multivaginatus. Racemus subdense multiflorus. Flores parvi. Sepala petalaque revoluto-circinnata. Sepala similia, oblonga vel triangulari-oblonga, apice abrupte rotundata, lateralia paulo majora et in saccum ovario adnatum basi producta. Petala linearia, apice abrupte rotundata. Labellum erectum, multo majus, subgloboso-concavum, valde carnosum, intus medio unicarinatum, basi utrinque in auriculam adnatam extensum. Columna abbreviata.

Plant terrestrial, strict, medium-sized for the genus, about 50.5 cm. high. Roots fascicled, tuberous, densely lanuginose. Stem up to the inflorescence glabrous, about 41.5 cm. long, rose-red, provided with many (about 13) sheaths which are relatively short imbricating and coriaceous at base, scarious longer and remote in the middle, and scarious and very short above. Leaves 3, entirely basal (i.e. rosulate), long-petioled; lamina ovate, acute, abruptly rounded to subtruncate at base, with the margins entire but often appearing erose-crenulate in the dried specimen, coriaceous, deep green above, silvery beneath with rose-red mid-rib, about 4.7 cm. long and 3 cm. wide; petioles fleshy and deeply sulcate, abruptly dilated above, rose-red, about 5.5-6.5 cm. long. Inflorescence subdensely many-flowered, looser below; rachis 8.5 cm. long, rose-red. Floral bracts ovate, long-acuminate, scarious, shorter than the ovary. Flowers very small, non-resupinate (i.e. with lip uppermost), tawny-yellow and salmon, sepals and petals submembranaceous and recurved-circinnate, lip fleshy. Dorsal sepal oblong or lanceolate-oblong, abruptly rounded at the apex, 1-nerved, about 3 mm. long and 1.2 mm. wide below when expanded. Lateral sepals triangular-oblong, forming at base a sac adnate to the ovary; free part similar to the dorsal sepal, shortly connate on the inner margins, about 3.5 mm. long and nearly 2 mm. wide below. Petals linear, abruptly rounded at the apex, 1-nerved, about 2.6 mm. long and 0.9 mm. wide. Lip relatively large, subglobose-concave, tapering on each side below into a long auricle which is mostly adnate to the sepaline wall but free at the apex, very fleshy, about 7-nerved, divided in the middle by a prominent but short longitudinal keel, glabrous within but densely minute-papillose on the outer surface. Column abbreviated, very stout (Fig. 28).

Type in herb. Chi. Nat. Hist. Mus., no. 1203753, *Brocchinia-Stegolepis-Heliamphora* swamp on southwest-facing shoulder, Ptaritepuí, state of Bolívar, alt. 2200 m., November 2, 1944, *Julian A. Steyermark 59772.*

This species is remarkable for its small coriaceous ovate leaves and for the medium keel or septum in the center of the fleshy lip. It appears to be somewhat allied to the widely distributed *Prescottia stachyodes* (Sw.) Lindl. which has larger membranaceous leaves and an ecarinate membranaceous lip.

Erythrodes confusa C. Schweinfurth, sp. nov.

Herba terrestris, alta. Caulis gracilis, pluriarticulatus cum articulis inferioribus radiciferis et superioribus foliiferis. Folia ellipticolanceolata, acuminata, basi sensim angustata, petiolata; petiolus in vaginam laxam infundibuliformem productus. Racemus erectus, dense multiflorus. Flores parvi. Sepalum dorsale lanceolato-ellipticum. Sepala lateralia oblongo-lanceolata, leviter falcata, antice late decurrentia. Petala oblique lineari-oblanceolata. Labellum in calcar pergracile productum; lamina supra medium utrinque constricta, cum lobo anteriore suborbiculari-ovato, conspicue apiculato; calcar elongatum, supra plusminusve incrassatum.

Plant terrestrial, tall, about 35 cm. in length to the tip of the raceme. Stem rather slender, many-jointed, glabrous except near the apex, dark purple, the lower portion producing at the joints pairs of long simple lanuginose roots, the upper portion loosely leafy. Leaves about eight, shortly petioled; lamina elliptic-lanceolate, acuminate, gradually narrowed below, membranaceous, many-nerved with three prominent sulcate nerves, dull above, silvery gray beneath, up to 10 cm. long and 2.65 cm. wide (the uppermost and lowermost leaves much smaller); petiole indistinct, about 2.7 cm. or less long, sulcate, gradually dilated below into a loose infundibuliform sheath. Inflorescence a dense, terminal, many-flowered raceme, about 4.3 cm. long. Floral bracts lanceolate, long-acuminate, concave, sparingly ciliolate. Flowers small, membranaceous, with a few scattered hairs without and with a slender glandular-pubescent ovary. Sepals dull lavender-brownish without, pale green at base and buff in upper half within. Dorsal sepal lanceolate-elliptic, acuminate, concave, 1-nerved, (indistinctly 3-nerved near the base), up to 7 mm. long and 2.2 mm. wide in the middle. Lateral sepals oblong-lanceolate, acuminate with inrolled margins, lightly falcate, long-decurrent at the base in front, 1-nerved (indistinctly 3-nerved toward the base), a little smaller than the dorsal sepal. Petals adherent to the dorsal sepal, very obliquely linear-oblanceolate, acute or acuminate, up to 7 mm. long and 1.1 mm. wide above, 1-nerved, the same color as the sepals. Lip produced into an elongate spur; lamina divided by an abrupt constriction into two parts; basal part oval, concave, with a little fold on each side at the constriction; anterior part suborbicular-ovate, abruptly acute or apiculate, about 2.5 mm. long and 2.6 mm. or less wide; spur very slender, more or less dilated above, up to 1.4 cm. long, white. Column dilated upward, terminating in an obtuse oblong-triangular wing (Fig. 29).

FIGURE 28

Prescottia carnosa. 1, Plant (X 4/5); 2, Flower and ovary, natural position (X 4); 3, Dorsal sepal (X 8); 4, Petal (X 8); 5, Lateral sepal (X 8); 6, Lip, partially expanded, from above (X 6).

FIGURE 29

Erythrodes confusa. 1, Plant (X 3/5); 2, Flower from the side (X 2); 3, Petal (X 5); 4, Column with anther attached, from the side (X 5); 5, Lip and spur, from above (X 3).

Type in herb. Chi. Nat. Hist. Mus., no. 1203776, southeastern-facing slopes along Caño Negro (tributary of Caño Iguapo), Cerro Duida, Territorio Federal Amazonas, alt. 305-1095 m., August 25-26, 1944, *Julian A. Steyermark 57966.*

This species appears to be allied to the Brazilian *Erythrodes commelinoides* (Rodr.) Ames, but differs in its narrower leaves and much smaller flowers with differently proportioned lip. In vegetative appearance it suggests *E. aratanhensis* (Rodr.) Ames and *E. multifoliata* C. Schweinf., but the perianth is very different.

Stelis dispar C. Schweinfurth, sp. nov.

Herba epiphytica, pro genere mediocris, rhizomatosa. Rhizoma gracile, vaginis arctis tubulatis omnino juventute velatum. Caules secundarii numerosi, rari vel approximati, apice unifoliati. Folium conspicue petiolatum; lamina oblongo-elliptica, acuta, infra cuneata. Inflorescentiae saepissime solitariae vel duae, diffusae vel suberectae, folium subaequantes vel duplo superantes, supra dense multiflorae. Flores perparvi, glabri. Sepala valde inaequalia, trinervia. Sepalum dorsale late ovatum vel rotundato-ovatum. Sepala lateralia similia, multo minora, valde obliqua. Petala minuta, suborbiculari-rhombica, cum parte anteriore late rotundata et incrassata. Labellum subaequale, valde incrassatum, semiorbiculari-ovatum antice visum, transverse cuneato-trapeziforme superne visum. Columna generis.

Plant epiphytic, medium-sized for the genus, producing an elongate rhizome. Roots fibrous, filiform, glabrous, scattered. Rhizome slender, irregularly flexuous, entirely concealed by close tubular sheaths which waste away in course of development. Secondary stems numerous, scattering (about 2.5 cm. apart) to approximate, making an acute angle with the rhizome, up to 7.2 cm. long (commonly much less), unifoliate at the apex, entirely or mostly concealed by two to four close tubular evanescent sheaths. Leaf erect or erect-spreading, distinctly petioled; lamina oblong-elliptic, acute with a minutely tridenticulate apex, cuneate below, coriaceous, about 4-7.5 cm. long, 9-17 mm. wide; petiole slender, about 2 cm. or more long. Inflorescences commonly solitary or two (rarely remnants of a third one appears), diffuse to suberect, subequaling to twice surpassing the leaf, subdensely to densely many-flowered and racemose above, rather loosely flowered toward the base. Floral bracts minute, infundibuliform, acute. Flowers very small, glabrous, deep purple or dull lavender with mulberry-purple lip. Sepals markedly unequal, 3-nerved, connate below. Dorsal sepal broadly ovate or round-ovate, obtuse to subacute, about 3 mm. long and nearly as wide below. Lateral sepals very obliquely round-ovate, about 2 mm. long and wide below. Petals minute, suborbicular-rhombic, with the anterior portion broadly rounded and fleshy-thickened, about 0.5 mm. long and 1 mm. wide. Lip subequal to the petals, very fleshy, with a transverse thickening across the middle and a small conical tubercle near the base, semiorbicular-ovate when viewed from the front, trans-

versely cuneate-trapeziform with a broad truncate-concave apex when viewed from above. Column of the genus (Fig. 30).

Type in Herb. Ames no. 64847, isotype in herb. Chi. Nat. Hist. Mus., no. 1221980, rich forest on slopes near summit of Cerro San Isidro, above La Carbonera, state of Mérida, alt. 2430-2745 m., April 22, 1944, *Julian A. Steyermark 56034*, "epiphyte on trunk of *Ladenbergia undata*, leaves fleshy subcoriaceous, dull green above, pale below"; same data, *Steyermark 56031*.

This species appears to be allied to the Ecuadorian *Stelis lancea* Lindl., but differs in its very unequal sepals and simple lip.

Lepanthes exilis C. Schweinfurth, sp. nov.

Herba epiphytica, caespitosa. Caules numerosi, pertenues, apice unifoliati, pluriarticulati, vaginis arctis glabris tubulatis omnino tecti. Folium lanceolatum vel elliptico-lanceolatum, acuminatum cum apice acriter tridenticulato, breviter petiolatum. Inflorescentiae axillares, saepissime plures, diffusae, multiflorae, quam folium plus-minusve longiores. Flores parvi, membranacei, glabri. Sepalum dorsale ovatum, acutum, concavum. Sepala lateralia in laminam late ovatam profunde bidentatam connata. Petala perparva, transverse oblonga cum lobo posteriore subquadrato-oblongo comparate longo et lobo anteriore minuto, triangulari. Labellum petala subaequans, 3-lobatum; lobi laterales comparate magni, late flabellati; lobus medius minutus, villosus. Columna generis.

Plant epiphytic, caespitose. Roots fibrous, glabrous, filiform, numerous. Rhizome abbreviated. Stems numerous, very slender, 1-leaved at the apex, several- (up to 14-) jointed, entirely concealed by close tubular glabrous sheaths which terminate in ovate spreading marginate, minutely hispid mouths, about 5 (rarely) -13 cm. long. Leaf very shortly petioled; lamina lanceolate to elliptic-lanceolate (often narrowly so), coriaceous, acuminate to a sharply tridenticulate apex, shortly cuneate below, 3.1-6.5 cm. long, up to 1.3 cm. or less wide; petiole about 5 mm. or less long. Inflorescences axillary, solitary to about 15, diffuse, laxly or subdensely many-flowered, surpassing the leaf (sometimes nearly three times as long). Floral bracts minute, infundibuliform. Flowers very small, membranaceous. Sepals distinctly connate below, tawny yellow with pale yellow margins. Dorsal sepal ovate, acute, concave, 3-nerved, up to 4 mm. long and 2.2 mm. wide when expanded. Lateral sepals with their inner margins connate to half their length, each sepal very obliquely ovate, acute, 2-nerved; lamina of lateral sepals broadly ovate, about 3.4 mm. long from the outer point of union with the dorsal sepal to the tip and 2.9 mm. wide near the base. Petals much smaller than the sepals, vermilion-orange, transverse, bilobed, about 0.8 mm. long and 1.9 mm. wide; posterior lobe much the larger, oblong-subquadrate with a very oblique obtuse apex; anterior lobe very small, triangular, obtuse. Lip adnate to the middle of the column, 3-lobed, orchid-rose; lateral lobes relatively large, broadly flabellate, the apex broadened

FIGURE 30

Stelis dispar. 1, Plant (X 3/5); 2, Flower, from the front (X 8); 3, Petal (X 16); 4, Lip, from above (X 16); 5, Lip, from the side (X 16).

into a transverse peltate plate about 1.6 mm. across; mid-lobe minute, oblong-ovate, long-hirsute. Column about 1.4 mm. long, dilated above, orchid-rose (Fig. 31).

Type in herb. Chi. Nat. Hist. Mus., no. 1207544, isotype in Herb. Ames no. 64841, on densely forested steep south-facing slopes overlying sandstone, between "Cave Rock" and base of high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2100-2285 m., October 30, 1944, *Julian A. Steyermark 59540* "leaves pale green above and paler green beneath".

This species appears to be allied to *Lepanthes cyanoptera* Reichb. f., but has longer leaves and dissimilar sepals and petals.

Pleurothallis callifera C. Schweinfurth, sp. nov.

Herba epiphytica, mediocris, caespitosa. Caules numerosi, graciles, variabiles, apice unifoliati. Folia valde variabilia, saepissime horizontalia, lanceolata vel saepius ovato-lanceolata vel ovata, acuta vel acuminata, basi cordata. Inflorescentiae abbreviatae, uniflorae, singulae vel plures. Flores parvi, bilabiati, glabri. Sepalum dorsale oblongo-ovatum, concavum, acutum. Sepala lateralia in laminam triangulari-ovatam, acutam, concavam omnino connata. Petala patentia, lineari-lanceolata, acuminata, basi obliqua. Labellum in positu naturali arcuato-recurvum et sulcatum, expansum rhombico-ovatum, membranaceum; discus prope basim carina transversa crescentiformi ornatus. Columna crassa, perbrevis.

Plant epiphytic, medium-sized, caespitose. Roots numerous, fibrous, glabrous. Rhizome abbreviated. Stems approximate, slender, provided below with 2 close separated tubular sheaths of which the upper is much the longer, very variable in size, about 9-23.5 cm. long, 1-leaved at the apex. Leaf very variable in form and size, commonly horizontal or widely spreading, lanceolate (rarely) to ovate-lanceolate or ovate, acute or acuminate with a minutely tridenticulate tip, cordate at the sessile base, 5.8-10.8 cm. long, 1.9-4.4 cm. wide. Inflorescences abbreviated, axillary, 1-flowered, apparently solitary to several, enclosed in an evanescent conduplicate spathe. Flower small, glabrous, bilabiate. Dorsal sepal oblong-ovate, acute, 3-nerved, concave, about 7 mm. long and 4 mm. wide. Lateral sepals entirely connate into a triangular-ovate concave lamina which is acute, 5- to 6-nerved, about 7 mm. long and 4.4 mm. wide. Petals linear-lanceolate, acuminate, oblique at the base, 1-nerved, about 6 mm. long and 1.1 mm. wide at the base. Lip arcuate-recurved and sulcate in natural position, rhombic-ovate when expanded, submembranaceous, cuneate below, obtuse at the apex, 3-nerved with the mid-nerve clavate and thickened near the tip, about 4 mm. long and 3.2 mm. or more wide when expanded; disc with a prominent transverse crecentiform keel or callus near the base. Column abbreviated, stout (Fig. 32).

Type in herb. Chi. Nat. Hist. Mus., no. 1206418, isotype in Herb. Ames no. 64844, on densely forested steep south-facing slopes over-

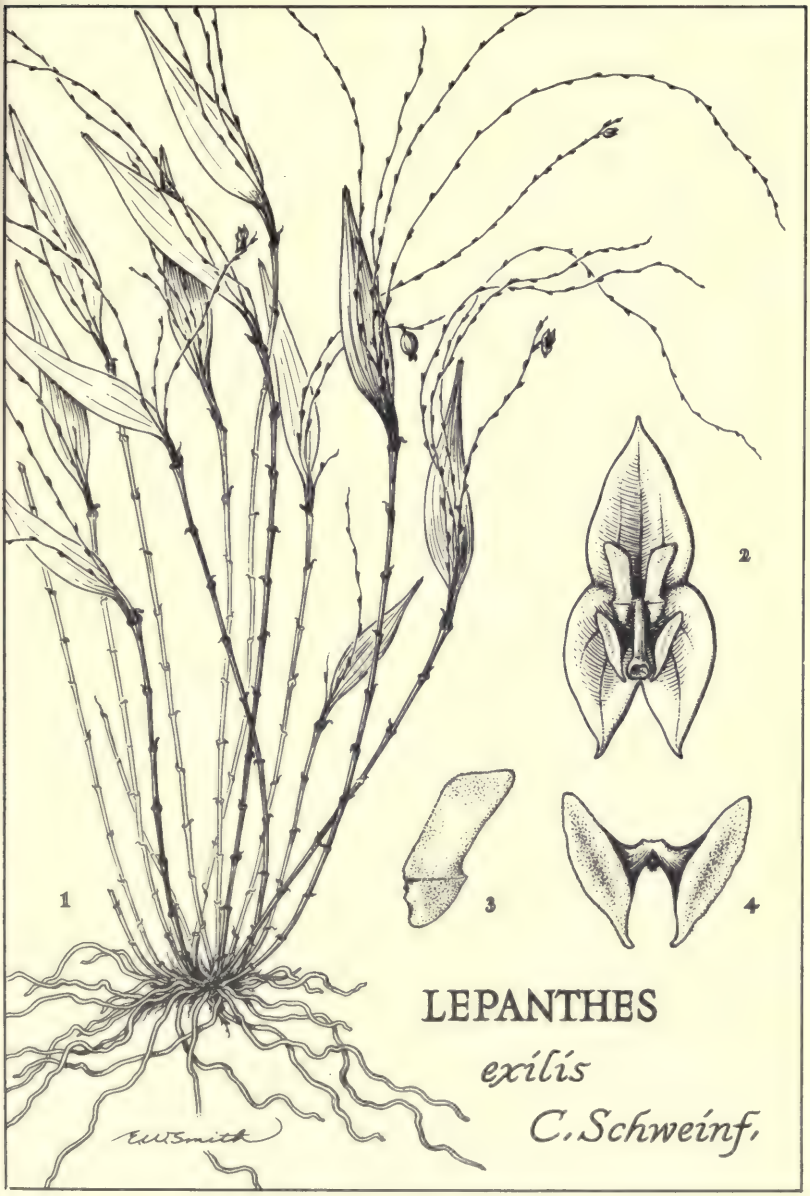

FIGURE 31

Lepanthes exilis. 1, Plant (X 3/5); 2, Flower, from the front, (X 7); 3, Petal (X 14); 4, Lip (X 14).

FIGURE 32

Pleurothallis callifera. 1, Plant (X 1/2); 2, Flower from the side (X 4); 3, Petal (X 5); 4, Lip, from above (X 5); 5, Lip and column, from the side (X 5).

lying sandstone, between "Cave Rock" and base of high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2100-2285 m., October 30, 1944, *Julian A. Steyermark 59541*, "leaves coriaceous, dark green above and pale green beneath; sepals translucent, dull green with dull lavender stripes; petals spreading, dull lavender; lip dorsal, erect, purple, depressed along the middle".

This species appears to resemble *Pleurothallis undulata* Poepp. & Endl., but the membranaceous rhombic-ovate lip is distinctive.

Pleurothallis exilis C. Schweinfurth, sp. nov.

Herba perparva, calcicola, caespitosa. Rhizoma abbreviatum. Caules secundarii perparvi, approximati, apice unifoliati. Folium late spathulatum vel anguste oblanceolatum, apice rotundatum vel acutum, infra sensim angustatum. Inflorescentia abbreviatae, bi-vel quadriflorae, flos membranaceus. Sepalum dorsale valde concavum, oblongo-lanceolatum, acutum. Sepala lateralia in laminam concavam elliptico-ovatam connata. Petala breviora, late obovata, obliqua, abruptius acuta. Labellum quam petala paulo brevius, in positu naturali conduplicatum, expansum anguste ovatum, apice rotundatum, marginibus anterioribus denticulatis. Columna apice cum ala lacerata.

Plant very small, caespitose. Roots fibrous, glabrous, relatively stout. Rhizome abbreviated. Secondary stems numerous, approximate, filiform, 1-jointed, mostly concealed by 2 imbricating tubular evanescent sheaths, 1-leaved at the apex. Leaf erect or spreading, broadly spatulate to narrowly oblanceolate, acute to rounded with a minutely tridenticulate apex, gradually narrowed to an indistinct petiole, up to 2.5 cm. long and 7 mm. wide, marginate. Inflorescence abbreviated, with two to four flowers, the segments (in our specimen) on the summit of an ellipsoid ovary. Dorsal sepal strongly concave, oblong-lanceolate, acute, 3-nerved, membranaceous, about 3.7 mm. long and 2 mm. wide when expanded. Lateral sepals connate into a concave elliptic-ovate lamina which is 4-nerved, about as long as the dorsal sepal and 3.4 mm. wide when expanded. Petals broadly obovate, oblique, rather abruptly acute, 1-nerved, about 2.6 mm. long and 1.6 mm. wide. Lip conduplicate and gently recurved in natural position, simple, narrowly ovate when expanded, rounded at the apex with the anterior margins denticulate, about 2.5 mm. long, finely papillose especially on the inner surface. Column shorter than the lip, slightly arcuate, terminated by a lacerate wing (Fig. 33).

Type in herb. Chi. Nat. Hist. Mus., no. 1206448, isotype in Herb. Ames no. 64846, base of limestone bluffs, Cerro de la Cueva de Doña Anita, south of and bordering valley of Caripe, state of Monagas, alt. 1100-1200 m., April 7, 1945, *Julian A. Steyermark 61902*, "common in crevices of lime bluffs, leaves deep green above and gray green beneath".

This little species recalls *Pleurothallis barbulata* Lindl., but has very different petals and lip.

FIGURE 33

Pleurothallis exilis. 1, Plant (X 2); 2, Flower from the side, partially expanded (X 5); 3, Petal (X 5); 4, Lip, from the side and from above (X 8).

Pleurothallis humilis. 5, Plant (X 2); 6, Flower from the side, partially expanded (X 5); 7, Petal (X 8); 8, Lip from above (X 12).

Pleurothallis humilis C. Schweinfurth, sp. nov.

Herba perparva, caespitosa, epiphytica. Caules secundarii abbreviati, vaginis duabus imbricatis tubularibus obtecti. Folium singulum, erectum, oblanceolatum vel lineari-oblanceolatum, apice abrupte rotundatum, infra longe angustatum. Inflorescentiae filiformes, singulae vel tres, saepissime folia superantes, supra univel laxe triflorae. Flos parvus, tenuis. Sepalum dorsale valde concavum, anguste lanceolatum, acuminatum. Sepala lateralia similia sed angustiora, obliqua. Petala oblique lineari-lanceolata, longe acuminata, sepalis paulo breviora. Labellum multo minus, in positu naturali oblanceolato-oblongum, acutum, cum lobulis erectis breviter rotundato-triangulis in parte inferiore. Columna crassa.

Plant very small, epiphytic, caespitose. Roots fibrous, glabrous, as stout as the stems. Stems abbreviated, about 8 mm. or less long, entirely or very nearly enveloped by 2 tubular imbricating translucent sheaths. Leaf solitary, erect, oblanceolate or linear-oblanceolate, abruptly rounded above with a minutely tridenticulate tip, long-narrowed below, fleshy-coriaceous and rich green with purple spots in natural condition and revolute margins in the dried state, up to 18 mm. long and 3.5 mm. wide when expanded, the mid-nerve being sulcate above and sharply carinate beneath in the dried specimen. Inflorescences filiform, 1-3 near the summit of the stem, usually more or less surpassing the leaf, 1- or loosely 3-flowered above. Flower small but large for the plant, thin and translucent in the dried specimen. Sepals and petals dull salmon-orange. Dorsal sepal strongly concave, narrowly lanceolate, acuminate, 3-nerved, about 5 mm. long and 1.5 mm. wide when expanded. Lateral sepals similar to the dorsal sepal, obliquely and narrowly lanceolate, acuminate, shortly connate at the base, about 5 mm. long and 1 mm. wide. Petals obliquely linear-lanceolate, long-acuminate, 1-nerved, slightly shorter than the sepals, about 0.75 mm. side. Lip red, much smaller than the other segments, oblanceolate-oblong in natural position, acute, glabrous, with a pair of incurved triangular-rounded lateral lobules near the basal third, about 2.25 mm. long and 0.5 mm. wide above. Column stout, about 1.5 mm. long (Fig. 33).

Type in herb. Chi. Nat. Hist. Mus., no. 1203736, epiphyte on tree on wooded slopes of Quebrada O-paru-ma, between Santa Teresita de Kavanayén and Río Pacairao (tributary of Río Mouak), state of Bolívar, alt. 1065-1220 m., November 20-21, 1944, *Julian A. Steyermark 60383.*

This little plant has several apparent allies. It differs from *Pleurothallis barbulata* Lindl. in having much larger sepals and petals and an eciliate lip. It has petals which are markedly unlike those of *P. pertenuis* C. Schweinf. and *P. sarcophylla* Reichb. f.

Pleurothallis Steyermarkii C. Schweinfurth, sp. nov.

Herba terrestris, magna. Caules approximati, longi, apice unifoliati. Folium ellipticum, apice abrupte acuminatum, infra longe an-

gustatum, coriaceum. Inflorescentiae axillares, pendulae vel reflexae, pluri-vel multiflorae. Flores comparate parvi, bilabiati, atropurpurei. Sepala membranacea. Sepalum dorsale lanceolatum vel ovato-lanceolatum, acuminatum. Sepala lateralia in laminam suborbicularem profunde concavam connata. Petala oblongo-lanceolata, longe acuminata, in positu naturali leviter incurva. Labellum parvum, in circuitu triangulari-ovatum, in positu naturali trilobatum cum lobis lateralibus basalibus obovato-semiorbicularibus et lobo terminali triangulari acuminato. Columna parva.

Plant large. Rhizome apparently abbreviated. Roots fibrous, pubescent, filiform, numerous. Stems approximate, rather slender, clothed in the lower part with about three distant close tubular sheaths which are evanescent in course of development, 41.5-65 cm. or more long (incomplete in the longest specimen), unifoliate at the apex, very rarely superposed. Leaf elliptic, abruptly acuminate with a tridenticulate tip and produced mucro, long-narrowed to a more or less petioled base, coriaceous, 15 - about 23 cm. long (longest blade incomplete), 5-7.1 cm. wide. Inflorescences axillary, one or two, nodding or recurved, subdensely several- to many-flowered, much shorter than the leaf, about 11 cm. or less in length. Floral bracts narrowly infundibuliform, abruptly acute. Flowers relatively small, deep wine-purple, bilabiate. Sepals membranaceous. Dorsal sepal lanceolate or ovate-lanceolate, acuminate, concave, 3-nerved, about 11 mm. long (tip incomplete), 4 mm. wide when expanded. Lateral sepals entirely connate into a deeply concave suborbicular lamina which is 6-nerved, about 10 mm. long and wide when partially expanded, subacute at the apex. Petals oblong-lanceolate, long-acuminate, lightly incurved in natural position, rather fleshy, 3-nerved, about 10 mm. long and 2 mm. wide below. Lip relatively small, triangular-ovate in outline, abruptly reflexed at the base, 3-lobed in natural position with obovate-semiorbicular lateral lobes and triangular acuminate mid-lobe, subentire when expanded, deeply cordate at base, about 4.1 mm. long from the basal margin of a lateral lobule to the tip of the lip and subequally wide below; disc with a pair of nipple-shaped calli in the center of the base. Column short and stout, about 2 mm. high at the back, with a very short foot in front (Fig. 34).

Type in herb. Chi. Nat. Hist. Mus., no. 1221987, isotype in Herb. Ames no. 64843, rich woods near and bordering Quebrada de Palmar, at foot of Páramo de Tamá, 2 kms. above Betania and 7 kms. above Villapaez, state of Táchira, alt. 2500 m., July 14, 1944, *Julian A. Steyermark 57246*, "leaves dark green above and dull green beneath, stems erect, dull green mottled with dark purple".

This species appears to be allied to the Ecuadorian *Pleurothallis antennifera* Lindl., but lacks the abbreviated upper stem-member, has shorter racemes and broader petals.

FIGURE 34

Pleurothallis Steyermarkii. 1, Upper portion of plant (X 3/5); 2, Basal portion of plant (X 2/3); 3, Flower, from the side (X 3); 4, Petal (X 3); 5, Lip from above (X 6); 6, Lip from the side (X 6).

Pleurothallis subtilis C. Schweinfurth, sp. nov.

Herba mediocris, epiphytica. Rhizoma abbreviatum. Caules secundarii approximati, graciles, a basi decumbenti suberecti, apice unifoliati. Folium lineare, apice abrupte tridentatum, basi cordatum, coriaceum, marginibus revolutis. Inflorescentiae axillares, uniflorae, singulae vel plures. Flores perparvi, flavidi, glabri. Sepalum dorsale valde concavum, suborbiculari-ovatum, obtusum. Sepala lateralia in laminam concavam suborbicularem, apice bidentatam connata. Petala falcata, oblongo-lanceolata. Labellum ovatum, obtusum, valde incrassatum, basi abrupte reflexum et a latere visum sigmoideum. Columna valde arcuata, supra dilatata.

Plant medium-sized, epiphytic, apparently caespitose. Roots fibrous, filiform, glabrous, numerous. Secondary stems very variable in size, numerous, slender, rigid, suberect from a decumbent base, 1-leaved at the apex, enveloped below by one to three close tubular evanescent sheaths, up to 19 cm. long. Leaf commonly horizontally spreading or reflexed, linear, narrowed above to an abrupt minutely tridentate apex of which the middle tooth is produced into a conspicuous mucro, cordate at the base, coriaceous with strongly revolute margins, very variable in size, up to 12.7 cm. long and about 8 mm. wide when expanded. Inflorescences axillary, abbreviated, 1-flowered, solitary or several (up to 7), enclosed by an evanescent concave spathe. Flower very small, bilabiate, glabrous, with sepals, petals and column pale yellow and lip deep yellow. Sepals concave. Dorsal sepal suborbicular-ovate, obtuse, 3-nerved, about 3.5 mm. long and 2.5 mm. wide when forcibly expanded. Lateral sepals connate into a suborbicular lamina which is bidentate at the apex, 4-nerved, and slightly shorter but broader than the dorsal sepal. Petals falcate, oblong-lanceolate, obtuse, 1-nerved, with slightly irregular margins, about 3.3 mm. long and 1 mm. wide. Lip ovate, very fleshy, obtuse, abruptly reflexed at the base and sigmoid in natural position when viewed from the side, cordate at the base when viewed from the front, about 2 mm. long and 1.5 mm. wide. Column strongly arcuate, abruptly dilated above (Fig. 35).

Type in herb. Chi. Nat. Hist. Mus., no. 1206354, isotype in Herb. Ames no. 64845, rich forest on slopes near summit of Cerro San Isidro, above La Carbonera, state of Merída, alt. 2430-2475 m., April 22, 1944, *Julian A. Steyermark 56030*, "epiphyte on *Ladenbergia undata*, leaves dull blue green above and paler beneath".

This species differs from the Bolivian *Pleurothallis scleropus* Schltr. in having smaller flowers with dissimilar sepals. It is vegetatively similar to the narrow-leaved form of the Peruvian *P. juninensis* Schltr.

Octomeria rhizomatosa C. Schweinfurth, sp. nov.

Herba epiphytica, pro genere alta et rigida. Rhizoma repens, elongatum ut videtur. Caules secundarii graciles, apice unifoliati,

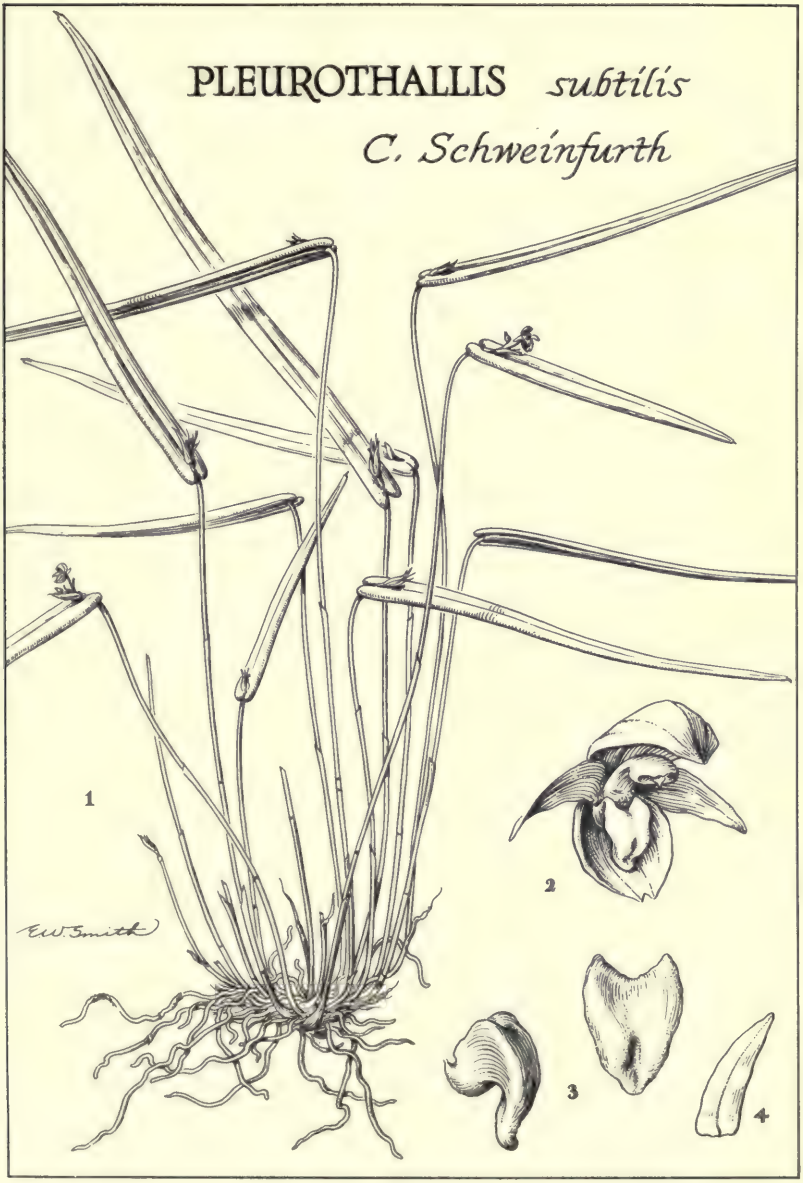

FIGURE 35

Pleurothallis subtilis. 1, Plant (X 3/5); 2, Flower, three-quarter view (X 6); 3, Lip from the side and from above (X 10); 4, Petal (X 6).

tri- vel quadriarticulati et vaginis pluribus tubulatis arcte ornati. Folia perangusta, oblongo- vel elliptico-linearia, apice acuto minute tridenticulata, basi breviter petiolata. Inflorescentiae abbreviatae, uniflorae, subaxillares, in fasciculo utroque flores plures ut videtur. Flores parvi, membranacei, flavidi, glabri. Sepala petalaque persimilia, elliptico-lanceolata, acuminata, trinervia. Labellum multo brevius, infra medium trilobatum, cum lobis lateralibus parvis, rotundatis, suberectis et lobo intermedio multo majore, apice acuto vel tridentato. Columna parva, leviter arcuata.

Plant epiphytic, tall for the genus. Rhizome creeping, apparently elongate, entirely concealed by close tubular sheaths which waste away during development. Roots fibrous, filiform, glabrous, apparently growing in scattered clusters. Secundary stems slender, 1-leaved at the apex, up to 2 cm. apart on the rhizome, subparallel with the rhizome or growing at a right angle from a decumbent base, 3- to 4-jointed, adorned at intervals with three to five close tubular evanescent sheaths, about 8-20 cm. long. Leaf rigidly erect or ascending, short-petioled; lamina oblong-linear or elliptic-linear, acute with a minutely tridenticulate apex, cuneate below, 11.7-19.5 cm. long, up to 1 cm. wide; petiole sulcate, about 7 mm. long. Inflorescenses subaxillary, abbreviated, 1-flowered, apparently with several flowers in each fascicle. Flowers small, membranaceous, glabrous, with creamy yellow sepals and petals and pale yellow lip. Dorsal sepal elliptic-lanceolate, acuminate, 3-nerved, about 8.4 mm. long and 2.5 mm. wide. Lateral sepals free, very similar to the dorsal sepal but slightly narrower (1.5 mm. wide), slightly oblique. Petals elliptic-lanceolate, acuminate, about 7 mm. long and 2.2 mm. wide, 3-nerved, Lip much shorter than the other segments, oblong-obovate in outline in natural position, 3-lobed below the middle, about 3.7 mm. long and 2 mm. across the lateral lobes when expanded, cuneate at base, pandurate-constricted on each side in the middle, acute and unequally 3-angled or tridentate in front; lateral lobes relatively very small, erect-incurved in natural position, rounded; disc with a pair of short distant keels extending from the middle of the lateral lobes to the dilated portion of the middle lobe. Column relatively small, gently arcuate, slightly narrowed above, about 2 mm. long at the back (Fig. 36).

Type in herb. Ames no. 64842, isotype in herb. Chi. Nat. Hist. Mus., no. 1207006, along Quebrada Sororopán, between Santa Teresita de Kavanayén and Río Tek-Yunsén, state of Bolívar, alt. 1375 m., December 3, 1944, *Julian A. Steyermark 60830*; cotype collected on forested sandstone south-facing slopes between plateau portion and "Cave Camp", Ptari-tepuí, alt. 1700-1800 m., November 1, 1944, *Julian A. Steyermark 59703*, "leaves deep green above and paler green beneath, flowers (buds) greenish yellow".

Another collection (*Steyermark 59703*), while furnishing only young buds, apparently represents this species. It differs in having some

FIGURE 36

Octomeria rhizomatosa. 1, Plant (X 1/3); 2, Flower, from the side (X 3); 3, Petal (X 3); 4, Dorsal sepal (X 3); 5, Lateral sepal (X 3); 6, Lip from above (X 7); 7, Column and lip from the side (X 7).

times greater intervals between the stems (up to nearly 3 cm.) and sometimes broader leaves (up to 1.2 cm. wide).

This species seems to be allied to the Colombian *Octomeria longifolia* Schltr., but has larger flowers with acuminate sepals and petals and a differently proportioned lip.

Acineta alticola C. Schweinfurth, sp. nov.

Herba robusta, saxicola, caespitosa. Pseudobulbi plusminusve ovoidei, apice tri-vel quadrifoliati. Folia elliptico-lanceolata vel oblonga, acuta vel saepius acuminata, plicata. Inflorescentia basalis, supra laxe pluriflora. Flores pro genere parvi, subglobosi. Sepala concava. Sepalum dorsale ovato-ovale, obtusum. Sepala lateralia similia, paulo majora, subobliqua, acuta. Petala obovato-elliptica, oblique subacuta. Labellum in partes duas divisum; pars basalis subquadrata, profunde concava; pars anterior leviter trilobata cum lobis lateralibus erectis transverse semiovalibus et lobo medio comparate parvo, triangulari; discus inter lobos cum callo carnoso alto subquadrato. Columna arcuata, supra sensim bialata.

Plant stout, caespitose, growing in dense mats on face of cliffs. Roots fibrous, stout, apparently lanuginose especially near the base, numerous, elongate. Pseudobulb ovoid to narrowly pyriform, 10.6-12 cm. long, bearing 3 or 4 leaves at the summit, more or less concealed at base by several broad evanescent sheaths of which the larger inner ones appear to be leaf-bearing. Leaves elliptic-lanceolate to narrowly elliptic-oblong, acute or acuminate, gradually narrowed to a convolute base, plicate, chartaceous, many-nerved with three to seven nerves conspicuously exserted beneath, variable in size and shape, up to 58 cm. long, 4.6-9 cm. wide. Inflorescence basal, suberect from a decumbent base, about 23 cm. long; basal portion provided with several short loose infundibuliform sheaths which are separated below and closely imbricated above; upper portion loosely about 12-flowered, apparently lepidote. Floral bracts oblong-lanceolate, concave, obtuse, widely spreading, about 2.6 cm. or less long. Flowers small for the genus, subglobose when viewed from the side, faintly fragrant. Sepals thickly-fleshy, pale green with scarious pale yellowish margins, the outer surface near the center with brown-purple dots. Dorsal sepal ovate-oval, deeply concave, obtuse, about 2.7 cm. long and 2 cm. wide when expanded. Lateral sepals obliquely oval-ovate, acute, concave, about 2.9 cm. long and 2.2 cm. wide. Petals obovate-elliptic, subacute, rather abruptly narrowed near the base, oblique near the apex, about 2.7 cm. long and 1.7 cm. wide, subcoriaceous, pale green with dull lavender spots within. Lip lightly sigmoid when viewed from the side, about equaling the other segments in length; sharply divided into 2 portions, basal part subquadrate, deeply saccate, about 1.2 cm. long; anterior part 3-lobed, the sinus between the lateral and terminal lobes being right-angled and lobulate at its base; lateral lobes erect, transversely semioval, without carinate growths within, greenish yellow with rich purple spots; mid-lobe relatively small,

FIGURE 37

Acineta alticola. 1, Plant (X 1/6); 2, Flower, from the side (X 2/3); 3, Petal (X 2/3); 4, Column and lip from the side, natural size; 5, Lip from above, natural size.

triangular with upcurved sides and subacute apex in natural position, broadly ovate if forcibly flattened, "pointed with inrolled margins"; deep yellow disc between the lateral lobes with a high subquadrate fleshy purple callus and a small irregularly subglobose callus just in front. Column relatively slender but gradually bialate toward the apex, arcuate, whitish above and greenish white and "lightly pubescent" below, about 2 cm. high (Fig. 37).

Type in herb. Chi. Nat. Hist. Mus., nos. 1203742, 1203744, isotype in Herb. Ames no. 64855, along base of east-facing high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2410-2450 m., November 7, *Julian A. Steyermark 59922.*

This species appears to be quite distinct from all of the other Acinetas noted by reason of the relatively shallow sinus between the lateral and middle lobes of the lip and by its abbreviated not spatulate middle lobe.

Zygopetalum Tatei *A. & S.* var. **angustilabium** C. Schweinfurth, var. nov.

Herba variabilis, pseudobulbis brevioribus et nunc latioribus unifoliatis atque labelli epichilio multo angustiore a specie differt.

Plant epiphytic, very variable, closely similar to the species. Pseudobulbs cylindric (as in the species) to ellipsoid or complanate-subglobose, up to 3 cm. long (instead of 3.6-6 cm. long in the species), unifoliate (not bifoliate). Scape about 13.5 cm. or less long (instead of 35 cm. or more long), 1- (rarely) or loosely 2-flowered above. Flowers about as large as those of the species except for the epichile of the lip which is ovate or rhombic-ovate and acuminate (instead of abruptly apiculate) about 1.9 cm. long and only 1.3 cm. wide (instead of 2.3-2.8 cm. wide in the species).

Type in herb. Chi. Nat. Hist. Mus., no. 1203947, isotype in Herb. Ames no. 64861, epiphyte on branch, summit of Carrao-tepuí, state of Bolívar, alt. 2470-2500 m., December 7, 1944, *Julian A. Steyermark 60909*, "sepals and petals pale yellow—or olive green with pale brown transverse bands, lip white with purple above and on crest, column rich yellow with magenta on margin and magenta streaks within"; same locality and date, epiphyte on trunk of *Bonnetia Roraimae*, "leaves coriaceous, dark green above and dull green beneath, sepals and petals orange-brown, lip white with dull brown at base, column dull orange", *Steyermark 60908;* same locality and date, "leaves dark green, lip creamy yellow, column pale grass green", *Steyermark 60910.*

Maxillaria condensata C. Schweinfurth, sp. nov.

Herba epiphytica, ramosa, late patens. Caules graciles, vetustiores remote pseudobulbiferi, partes juniores cum vaginarum foliiferarum disticharum imbricantium fasciculis. Folia parva, variabilia, saepissime elliptica vel oblonga, crassa ut videtur. Flores parparvi, e vaginarum axillis exorientes. Sepalum dorsale elliptico-oblongum,

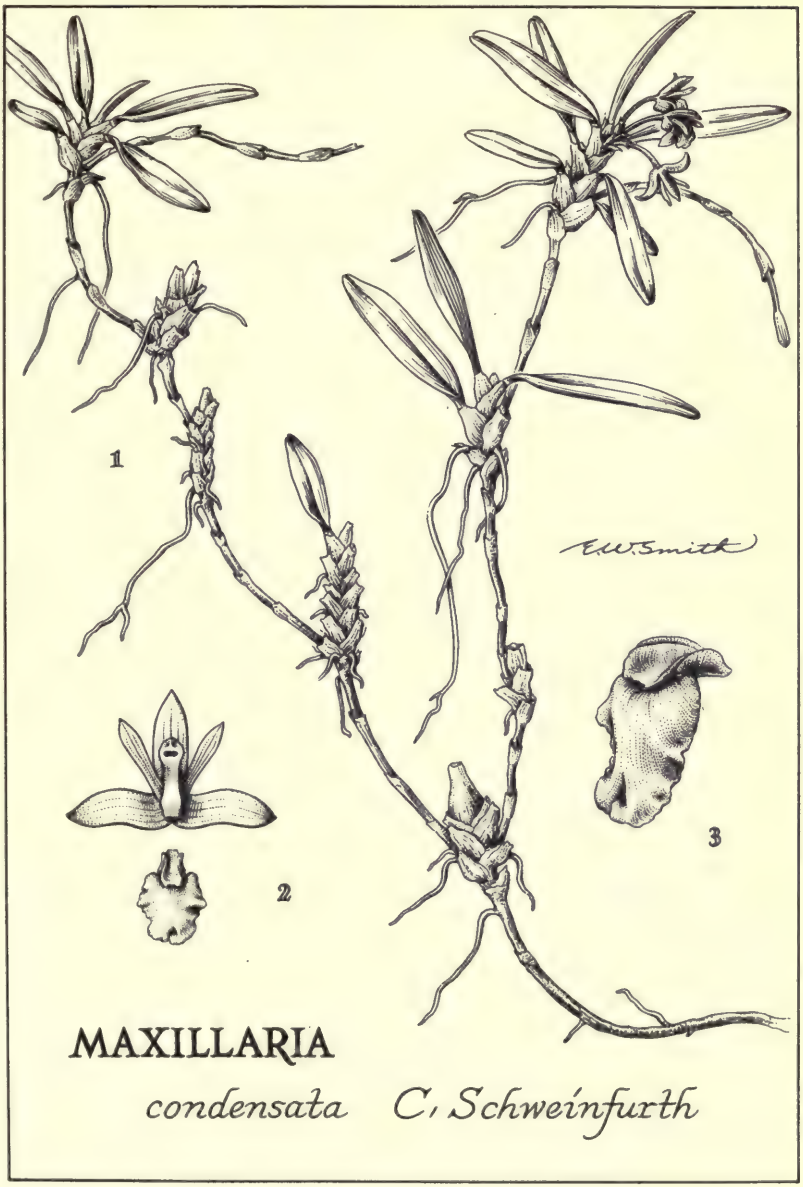

FIGURE 38

Maxillaria condensata. 1, Plant (X 3/5); 2, Flower from the front, expanded with the lip detached (X 2); 3, Lip, three-quarter view (X 4).

acutum. Sepala lateralia falcato-oblonga, acuta. Petala oblanceolato-linearia, acuta. Labellum in partes duas divisum; pars basalis columnae parallela, tubulari-concava, expansa elliptica; pars anterior leviter convexa, ovato-subquadrata, apice profunde bilobata. Columna conspicua, in pedem sensim producta.

Plant epiphytic, sprawling. Stems irregularly much branched, slender, bearing pseudobulbs at more or less remote intervals, producing scattered fibrous, filiform, glabrous roots mostly beneath or in the vicinity of the pseudobulbs or among the remote strobiliform clusters of leaves on the younger parts; stem-members adorned with several short infundibuliform sheaths which are more or less distant and evanescent in age, up to 9.3 cm. long in our specimens. Pseudobulbs well-developed only on the older portions of the plant, narrowly ovoid to ellipsoid, unifoliate at the apex, about 1.5 cm. or less long and apparently surmounting abbreviated stems which are enveloped by several pairs of closely imbricating evanescent leaf-bearing sheaths. Upper portions of the stems producing short strobiliform clusters of several distichous, closely imbricating leaf-bearing sheaths. Leaves small, apparently fleshy, variable in size and shape, elliptic to oblong or linear, subacute to abruptly rounded with a minutely tridenticulate more or less oblique apex, up to 4.6 cm. long, 3.5-8.5 mm. wide, sessile at the narrowed complicate base. Inflorescences abbreviated, 1-flowered, in the axils of leaf-bearing sheaths on the younger portions of the plant. Flowers very small on relatively elongate pedicels, with subfleshy segments. Sepals pale greenish yellow. Dorsal sepal elliptic-oblong, acute, 3-nerved, about 7 mm. long and 3 mm. wide. Lateral sepals obliquely oblong, lightly falcate, acute, 3-nerved or obscurely 5-nerved, about 7 mm. long and 3 mm. wide. Petals oblanceolate-linear, acute, 3-nerved, about 6 mm. long and 1.3 mm. wide, maroon-purple or wine purple-red. Lip about as long as the other segments, with the lower half erect and parallel to the column and the anterior half recurved in natural position, pale yellow with dull lavender spots on anterior lobe; lower portion tubular-concave, broadly elliptic when expanded, minutely erose in front and extending onto the anterior portion; anterior portion lightly convex, ovate-subquadrate, deeply bilobed with overlapping lobules, the lateral margins slightly constricted above the middle and irregularly denticulate, provided with a conical tubercle beneath the apical indentation. Column prominent, arcuate, slightly dilated above, cream-colored, about 4 mm. high at the back, extended gradually into a conspicuous foot (Fig. 38).

Type in Herb. Ames no. 64858, isotype in herb. Chi. Nat. Hist. Mus., no. 1206998, lower southeastern slopes of Carrao-tepuí, state of Bolívar, alt. 1675-1980 m., December 5-6, 1944, *Julian A. Steyermark 60873*, "on dead mossy log".

There do not appear to be any near allies of this species.

The specific name is in allusion to the short crowded branches.

Maxillaria patula C. Schweinfurth, sp. nov.

Herba robusta, alticola, ramosa. Caules crassi, saepius ramosi, plusminusve remote pseudobulbiferi. Pseudobulbi ovoidei vel anguste pyriformes, saepissime unifoliati, basi vaginis foliiferis distichis obtecti. Folia oblongo-elliptica vel oblonga, apice rotundata, basi conduplicata sessilia. Inflorescentiae abbreviatae, uniflorae, ex bractearum axillis exorientes. Flores parvi, carnosi, aurantiaci. Sepala similia, concava, ovata, vel oblongo-ovata, acuta vel acuminata. Petala late oblonga, acuta. Labellum erectum et columnae parallelum, leviter sigmoideum, prope apicem distincte trilobatum; lobi laterales erecto-incurvi, semiobovati; lobus terminalis parvus, ovato-rotundatus. Columna parva, antice complanata, infra incrassata.

Plant robust, with sprawling stems. Stems stout, usually loosely branched, bearing pseudobulbs at varying intervals; stem-members between the pseudobulbs 2-10 cm. long, several-jointed, the older ones naked, the younger ones more or less entirely concealed by approximate or imbricating infundibuliform sheaths, bearing scattering fibrous glabrous roots mostly beneath or in the vicinity of the pseudobulbs. Pseudobulbs ovoid to narrowly pyriform, 1- or rarely 2-leaved at the apex, up to 3 cm. high, surrounded below by several (usually two or three) pairs of distichous imbricating leaf-bearing sheaths, the blades being successively larger upward. Leaves elliptic-oblong to oblong, rounded above with a somewhat unequally bilobed and apiculate tip, sessile with a cuneate conduplicate base, up to 7 (rarely 9.2) cm. long and 1.5 cm. wide, coriaceous. Inflorescences rising singly from the axils of the clustered bracts on the younger apical portions of the stems, abbreviated, 1-flowered. Flowers campanulate in natural position, fleshy, vermilion-orange with orange-yellow to golden lip and column. Dorsal sepal concave, ovate or oblong-ovate, acute (acuminate in natural position), about 10 mm. long and 5.6 mm. wide when expanded. Lateral sepals very similar but slightly longer and narrower than the dorsal sepal, lightly oblique. Petals broadly oblong, acute, about 7.2 mm. long and 3 mm. wide. Lip continuous with the column, upcurved and parallel to the column in natural position, very fleshy, lightly sigmoid, about 7.1 mm. long, sharply 3-lobed near the apex, oblong when viewed from above; lateral lobes erect-incurved, relatively elongate, semiobovate from a cuneate base, with a rounded free terminal portion; mid-lobe much smaller, ovate-rotundate, rounded above with a conical mucro beneath; disc with a broad central thickening extending from the base nearly to the apex of the upcurved lateral lobes. Column short, stout, about 4 mm. high at the back, with the lower portion gradually dilated into a short stout foot (Fig. 39).

Type in herb. Chi. Nat. Hist. Mus., no. 1206446, isotype in Herb. Ames no. 64859, between headwaters of Río Colorado and summit of southern peak, Cerro Turumiquire, state of Sucre, alt. 2200-2400 m.,

FIGURE 39

Maxillaria patula. 1, Plant (X 3/5); 2, Flower from the side, (about X 1-1/2); 3, Flower from the front, expanded with the lip detached (X 2); 4, Lip, three-quarter view (X 4).

May 7, 1945, *Julian A. Steyermark 62650*, "leaves deep olive green above and dull green beneath".

This species is habitally very similar to the West Indian *Maxillaria croceorubens* (Reichb. f.) L. O. Wms. (*Ornithidium croceorubens* Reichb. f.), but the petals and lip are very different.

Oncidium diffusum C. Schweinfurth, sp. nov.

Herba epiphytica, venusta. Rhizoma abbreviatum. Pseudobulbi aggregati, ovoidei vel anguste ovoidei, valde complanati ut videtur, apice unifoliati. Folium lanceolato-ellipticum, acutum, in petiolum brevem sulcatum angustatum, membranaceum. Inflorescentia lateralis, pendula, diffusa, perlaxe paniculata cum ramis laxe paucifloris. Flores parvi, segmentis patentibus. Sepalum dorsale oblanceolato-spathulatum, infra longe angustatum. Sepala lateralia similia sed majora, omnino libera, oblique spathulata, basi longe et anguste unguiculata. Petala obovato-spathulata, quam sepala breviora sed latiora. Labellum suborbiculari-ovatum, basi cordatum, supra conspicue constrictum lobulum subquadratum retusum formans; discus basi medio cum callo conspicuo apice tridentato ornatus. Columna brevis, utrinque ala lata transverse oblonga praedita.

Plant epiphytic, graceful. Rhizome apparently abbreviated. Roots fibrous, filiform, glabrous, numerous. Pseudobulbs crowded, ovoid or narrowly ovoid, unifoliate at the apex, apparently strongly complanate, about 3.7 cm. or less long, surrounded at base by one or more pairs of distichous leaf-bearing sheaths which are evanescent as the plant develops. Leaf petioled; lamina lanceolate-elliptic, acute, cuneate below, membranaceous, about 13 cm. or less long and 2.6 cm. or less wide; petiole conduplicate, about 2 cm. or less long. Inflorescence lateral, elongate, very loosely paniculate, diffuse, pendent (detached in our specimen), apparently over 70 cm. long; branches short, about 5-8 cm. apart, loosely few-flowered, with slender fractiflex rachis. Bracts ovate, concave, acuminate with prominent mid-nerve. Flowers small for the genus, with widely spreading segments. Dorsal sepal oblanceolate-spatulate, subacute at the recurved apex, long-narrowed to a very slender base, about 9.2 mm. long and 3.4 mm. wide above. Lateral sepals similar, entirely free, obliquely spatulate, subacute with a recurved thickened apex, gradually narrowed to a long sulcate claw, about 11 mm. long and 3.9 mm. wide above. Petals obovate-spatulate, broadly rounded at the apex (sometimes with a short acute tip), narrowed to a short claw, about 7.9 mm. long and 5 mm. wide above. Lip suborbicular-ovate in outline, cordate at base, convex or reduplicate in natural position rather abruptly constricted in front to form a relatively small subquadrate terminal lobe which is bilobulate and apiculate, about 7.8 mm. long in greatest length (from either side of the base to the apex) and 8 mm. wide below; disc provided through the basal central half with a conspicuous callus which is irregularly toothed above and terminates in three teeth of which the middle one is longest. Column

short, about 4 mm. high at the back, with a conspicuously beaked rostellar process, provided above with a pair of broadly and transversely oblong petaloid wings and below with a pair of small retuse subquadrate plates (Fig. 40).

Type in herb. Chi. Nat. Hist. Mus., no. 1204664, wooded quebrada in Montana of Río Táchira at base of Páramo de Tamá, between Betania and Tamá, by Colombian-Venezuelan boundary, state of Bolívar, alt. 2430 m., July 13, 1944, *Julian A. Steyermark 57180*, "sepals and petals pale yellow above, pale brown near base, lip pale yellow with pale brown blotches, crest of lip pale creamy yellow".

This species seems to be allied to *Oncidium pyramidale* Lindl., but has a lax open panicle, a much narrower mid-lobe of the lip and very dissimilar column-wings.

Lockhartia latilabris C. Schweinfurth, sp. nov.

Herba epiphytica, caespitosa. Caules rigidi, simplices, foliorum basibus imbricatis omnino tecti. Folia numerosa, disticha, equitantia, triangulari-oblonga, breviter acuta, valde adscendentia. Inflorescentiae perbreves, pauciflorae. Flores pro genere grandes, flavi. Sepala elliptico-ovata. Petala majora, elliptico-obovata, antice late rotundata. Labellum simplex, suborbiculari-reniforme, leviter retusum, marginibus irregulariter denticulatis; discus medio calloso-incrassatus. Columna perbrevis, crassa.

Plant epiphytic, caespitose, medium-sized for the genus. Roots numerous, fibrous, glabrous, filiform, more or less branched. Stems straight, up to 17 cm. high, entirely concealed by the imbricating bases of the leaves. Leaves very numerous, distichous, equitant, triangular-oblong or triangular-lanceolate, strongly ascending, shortly acute, often slightly incurved above, up to 2.3 cm. long on the outer margin and 5.5 mm. wide across the base. Inflorescences apparently solitary in several of the upper leaf-axils, subequaling the leaves. Floral bracts broadly ovate, acuminate, amplexicaul below. Flowers large for the genus, membranaceous, pale yellow, the lip being spotted with orange-brown toward the center. Dorsal sepal elliptic-ovate, subacute at the rounded apex, 3-nerved, about 8.8 mm. long and 5 mm. wide. Lateral sepals similar but slightly broader, acute, concave below, slightly oblique. Petals larger than the sepals, elliptic-obovate, broadly rounded above, with slightly irregular margins, 3-nerved with the lateral nerves branching, about 10.8 mm. long and 7 mm. wide. Lip simple, noticeably broader than long, suborbicular-reniform, concave, lightly retuse, with irregularly denticulate margins (except near the truncate basal portion), about 10 mm. long on either side of the retuse center and 15 mm. wide; disc callose-thickened throughout the basal and central portions, the thickening appearing bilobed in the center and with lacerate margins. Column very short and stout with a semiovate wing having irregular margins on each side (Fig. 41).

FIGURE 40

Oncidium diffusum. 1, Plant (X 3/5); 2, Flower, three-quarter view (X 1-1/2); 3, Dorsal sepal (X 2); 4, Petal (X 2); 5, Lateral sepal (X 2); 6, Column from the front, with wings expanded (X 2); 7, Lip from above (X 2).

FIGURE 41

Lockhartia latilabris. 1, Plant (X 4/5); 2, Flower expanded, from the front (X 3).

Type in herb. Chi. Nat. Hist. Mus., no. 1203732, isotype in Herb. Ames no. 64848, at western end of Sororopán-tepuí, Salto de Iwaracarú-merú, state of Bolívar, alt. 1615 m., November 15, 1944, *Julian A. Steyermark 60222*, "epiphyte on tree trunk along stream above waterfall".

The simple and unlobed lip of this species is distinctive from that of most Lockhartias, while the shape and the lack of any distinct keel appears to be unique.

PIPERACEAE[13]

Peperomia Steyermarkii Yuncker, sp. nov.

Herba parva glabra terrestris; caule tuberoso; foliis suborbicularibus, 8-10 mm. diametientibus, peltatis 5-nerviis; petiolo filiformi ad 3.5 cm. longo; spicis 1 mm. crassis, 15-20 mm. longis; pedunculo filiformi 2-2.5 cm. longo; drupa globoso-ovoidea, stylo brevi subulato; stigmate apicali.

A small delicate tufted glabrous terrestrial herb; stem corm- or tuber-like, 3-4 mm. thick; leaves when living fleshy-membranous, deep green above, suffused with purplish with a pale green spot near the base in center and with pale green areolate veins radiating from this spot, silvery pale green or suffused with lavender beneath, suborbicular, 8-10 mm. in diameter, peltate 2-4 mm. from the margin, with 5 delicate anastomosing nerves from the petiole, drying very membranous, subpellucid; petioles filiform, up to 3.5 cm. long, pale greenish-white when living; spikes 1 mm. thick x 15-20 mm. long when dry; peduncle filiform, often rose-lilac when growing, 2-2.5 cm. long, sometimes with a leaf about 1 cm. below the spike; bracts round-peltate; fruit globose-ovoid, black, verrucose, about 0.8 mm. long, with a short subulate style; stigma apical.

Type in herb. Chil Nat. Hist. Mus., collected at edge of cafetal, below limestone bluffs, Cerro de la Cueva de Doña Anita, south of and bordering valley of Caripe, state of Monagas, alt. 1200 m., April 7, 1945, *Julian A. Steyermark 61874.*

Piper Arbelaezii Trel. & Yun., var. **subglabrirameum** Yuncker, var.nov.

Frutex 3-4 m. altus; internodiis innovationum laeviter hirtulis mox glabrescentibus; spicis 12 mm. crassis, 70 cm. vel ultra longis; pedunculo 8-9 cm. longo, glabro; bracteis sub margine fimbriatis, dorso longe pilosis.

Shrub 3-4 m. tall, planted at times for ornament; young internodes thinly hirtellous, quickly glabrescent; leaves subcoriaceous, deep green above, silvery green beneath; spikes creamy-white, recurved-drooping, 5-6 mm. thick in anthesis, 12 mm. in fruit, up to 70 cm. or more long; peduncle 8-9 cm. long, glabrous; bracts submarginally fringed, dorsally long-pilose. Otherwise as in the species.

Type in herb. Chi. Nat. Hist. Mus., collected along Río Zumbador and tributary, near base of Piedra Blanca, northeast of Bergantín, state of Anzoátegui, alt. 800-1000 m., March 1-2, 1945, *Julian A. Steyermark 61298.*

[13]By T. G. Yuncker

Piper bolivaranum Yuncker, sp. nov.

Planta glabra vix pedalis; foliis anguste lanceolatis, 10-17 mm. latis, 6-8 cm. longis, apice sensim acuminatis basi acutis, a tertio supero deorsum pinnatim venosis; petiolo 2-10 mm. longo; spicis 3 mm. crassis, 25 mm. longis; pedunculo filiformi, 10-12 mm. longo; bracteis triangulari-subpeltatis anguste fimbriatis; drupa truncato-trigona; stigmatibus sessilibus.

A small glabrous soft-wooded branching plant scarcely 30 cm. tall; internodes 1-3 cm. long; leaves membranous, deep green above, paler beneath, narrowly lanceolate, 10-17 mm. wide x 6-8 cm. long, apex gradually acuminate, base equilaterally acute, pinnately nerved below the upper third with about 3 ascending nerves on each side, loop-connected and joined to the midrib with numerous horizontal nervules, drying membranous, translucent, minutely pellucid-dotted; petiole 2-10 mm. long; peduncle filiform, 10-12 mm. long; bracts triangular-subpeltate, narrowly marginally fringed; fruit truncate-trigonous, granulate; stigmas 3, small, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected on mossy-covered banks of streamlet on plateau near "Misia Kathy Camp", Ptari-tepuí, state of Bolívar, alt. 1585 m., October 28, 1944, *Julian A. Steyermark 59468.*

Piper el-paramoense Yuncker, sp. nov.

Frutex 2-3 m. altus; internodiis superis parcius hirtulis; foliis ovato-ellipticis, 7-8 cm. latis, 14-15 cm. longis, apice acutis, basi oblique inaequilateraliter cordatis, lobis rotundatis quam petiolo brevioribus, ad tertium superum pinnatim venosis, supra glabris, subtus ad venas hirtulis; petiolo 2-4 cm. longo subvilloso ad laminam vaginato-alato; spicis 4-5 mm. crassis, 11 cm. longis; pedunculo 2 cm. longo pubescente; bracteis concavo-subcucullatis, margine brevi-fimbriatis; ovario ovoideo; stigmatibus sessilibus.

A shrub 2-3 m. tall, upper internodes short and slender, sparingly hirtellous glabrescent; leaves when living spicy-fragrant, membranous, dull green above, greenish-silvery beneath, elliptic-ovate, 7-8 cm. wide x 14-15 cm. long, apex acute, base obliquely inequilaterally cordate with rounded lobes shorter than the petiole, sinus narrowly acute or closed with the lobes slightly overlapping, pinnately nerved to the upper third, the nerves 5 or 6 on each side, prominent beneath, slightly impressed above, with rather prominent cross-connecting and anastomosing nervules, drying somewhat membranous, translucent; petiole 2-4 cm. long, subvillous, vaginate-winged to the blade; spikes 4-5 mm. thick x 11 cm. long, nodding; peduncle slender, 2 cm. long, pubescent; bracts concave-subcucullate, marginally short-fringed; ovary ovoid; stigmas 3, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected at El Páramo, northeast of Las Delicias, northeast of Caripe, state of Monagas, alt. 1200-1450 m., April 13, 1945, *Julian A. Steyermark 62038.*

Piper monagasense Yuncker, sp. nov.

Frutex 5-6 m. altus; internodiis indumento conferto brunneo intertexto vestitis; foliis ovatis 13-16 cm. latis, 27-30 cm. longis, apice acutis, basi cordatis, lobis basalibus rotundatis approximatis obtegentibusve, supra secus venas villosis, subtus dense crispe villosis, a tertio supero deorsum pinnatim venosis; petiolo 4 cm. longo, indumento brunneo intertexto praedito, ad laminam vaginato-alato; spicis 7-8 mm. crassis, 35 cm. vel ultra longis; pedunculo 3.5 cm. longo, pubescentia intertexta vestito; bracteis triangulari-subpeltatis, conferte ad marginem fimbriatis; ovario ovoideo, stigmatibus sessilibus.

A shrub 5-6 m. tall; upper internodes comparatively slender and elongated, densely matted brown-villous; leaves when living dark green with sulcate loose areolate nerves above, silvery-gray green beneath with raised nerves, ovate, 13-16 cm. wide x 27-30 cm. long, apex acute, base cordate, lobes rounded, approximate or overlapping, nearly equal or one lobe somewhat longer, pinnately nerved below the upper third, the nerves 6 or 7 on each side, submarginally loop-connected, with rather prominent cross-connecting and anastomosing nervules, villous above along the nerves, densely crisp-villous beneath, the hairs brown, drying coriaceous, opaque; petiole 4 cm. long, matted brown-villous, vaginate-winged to the blade; spikes pendent, 7-8 mm. thick x 35 cm. or more long in fruit; peduncle 3.5 cm. long, matted-villous; bracts triangular-subpeltate, densely marginally fringed with brown hairs, the pedicel villous; ovary ovoid; stigmas 3, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected on forested southwest-facing slopes of Cerro Negro, above La Sabana de Las Piedras, northwest of Caripe, state of Monagas, alt. 1500 m., April 5, 1945, *Julian A. Steyermark 61853.*

Piper oparumaense Yuncker, sp. nov.

Suffrutex 2-3 m. altus; internodiis superis lenticulato-verrucosis, glabris; foliis ovatis, 17 cm. latis, 28-30 cm. longis, apice obtusis, basi inaequilateraliter cordatis, sinu obliquo clauso, venis subtus puberulis, ad quartum superum pinnatim venosis; petiolo 3-5 cm. longo ad laminam vaginato-alato, lenticulato-verrucoso; spicis 1 x 30 cm. magnis; pedunculo 2-3 cm. longis; bracteis rotundato- vel subtriangulari-subpeltatis; drupa oblonga subtetragona, apice paullo papilloso; stigmatibus sessilibus.

A soft-wooded subshrub 2-3 m. tall; upper internodes moderately short and slender, lenticular-warty, glabrous; leaves when living subcoriaceous, deep green above, paler beneath, ovate, 17 cm. wide x 28-30 cm. long, apex obtuse, base inequilaterally cordate with oblique closed sinus, lobes rounded, the larger longer than and covering the petiole, pinnately nerved to the upper fourth, the nerves about 6 on each side with 3 additional recurved nerves in the longer lobe, submarginally loop-connected in two series, with rather strong

cross-connecting and anastomosing nervules, glabrous above, the nerves beneath puberulent, drying coriaceous, opaque; petiole 3-5 cm. long, glabrous, vaginate-winged to the blade, lenticular-warty; spikes 1 cm. thick x 30 cm. or more long when mature; peduncle 2-3 cm. long, glabrous; bracts rounded- or subtriangular-subpeltate, somewhat inflexed ventrally, papillate and brown-hairy on the ventral margin and pedicel; fruit oblong-subtetragonous, somewhat papillate at the apex; stigmas 3, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected in lower portion of Quebrada O-paru-má, tributary of Río Pacairao, below Santa Teresita de Kavanayen, state of Bolívar, alt. 915-1065 m., November 25, 1944, *Julian A. Steyermark 60548.*

Piper perlongivillosum Yuncker, sp. nov.

Frutex nodosus 1 m. altus; internodiis superis indumento hirtulo cum pilis longioribus intermixto vestitis; foliis elliptico-subovatis, 6-8 cm. latis, 18-21 cm. longis, apice subcaudatim acuminatis, basi subaequilateraliter rotundatis cordulatisve, venis subtus hirtulis, fere totis pinnatim venosis; petiolo ca. 5 mm. longo hirtulo-villoso; spicis 4 mm. crassis, 6 cm. vel ultra longis; pedunculo 2 cm. vel ultra longo; bracteis parvis subcucullatis apice triangulari-truncatis; fructu obovoideo bene angulato subalatove; stigmatibus sessilibus.

A nodose shrub about 1 m. tall; upper internodes short and slender, hirtellous intermixed with rather stiff hairs up to 3-4 mm. long; leaves when living rugose on both sides, dark dull green above, paler beneath, firmly membranous, elliptic-subovate, 6-8 cm. wide x 18-21 cm. long, apex subcaudately acuminate, base subequilaterally rounded, cordulate, pinnately nerved throughout, the nerves 10-12 or more on each side, submarginally loop-connected, with shorter intermediates and cross-connecting anastomosing nervules, glabrous and somewhat depressed-punctate above, the nerves beneath staring hirtellous, the midrib with scattered long hairs, drying chartaceous, translucent, narrowly revolute; petiole stout, about 5 mm. long, hirtellous-villous; spikes 4 mm. thick x 6 cm. or more long, dull green when living, rather loosely flowered; peduncle slender, 2 cm: or more long, hirtellous-villous; bracts small, subcucullate with triangular-truncate apex, hispidulous; fruit obovoid, strongly angled or subalate, glabrous; stigmas small, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected on southeastern-facing slopes along Caño Negro (tributary of Caño Iguapo), Cerro Duida, Territorio Federal Amazonas, alt. 305-1095 m., August 25-26, 1944, *Julian A. Steyermark 57953.*

The rugose leaves, dimorphic hairs and strongly angular or somewhat winged fruit are distinctive characters of this species.

Piper Steyermarkii Yuncker, sp. nov.

Frutex scandens glaber epiphyticus; foliis ellipticis 3.5-6 cm. latis, 10-15 cm. longis, apice sensim acute acuminatis, basi aequi-

lateraliter acutis, a medio infero pinnatim venosis; petiolo ad 25 mm. longo ad medium et ultra vaginato; spicis 5 mm. crassis, 5 cm. longis; pedunculo vix 5 mm. longo; bracteis parvis rotundato-subpeltatis, conferte longeque pallido-fimbriatis; fructu subgloboso, brevistyloso.

A climbing epiphytic glabrous nodose shrub; internodes slender, elongate; leaves subcoriaceous, deep glossy-green above, paler beneath, elliptic, 3.5-6 cm. wide x 10-15 cm. long, apex attenuately sharp-acuminate, base equilaterally acute, pinnately nerved from the lower half, the nerves 2-4 on each side or in large leaves with a faint fifth nerve near the base, the innermost pair connected with the midrib with shorter nerves upward, drying coriaceous, opaque, narrowly revolute; petioles up to 25 mm. long below, reduced upward, vaginate and narrowly winged to above the middle, drying somewhat corrugated; spikes white when in flower, pale green and 6-7 mm. thick in fruit when growing, 5 mm. thick x 5 cm. long when dry; peduncle scant 5 mm. long; bracts small, round-subpeltate, densely long pale-fringed; ovary ovoid, tapering into a short stout style; stigmas 3, small; fruit subglobose, somewhat granulate, glabrous.

Type in herb. Chi. Nat. Hist. Mus., collected on southeast-facing, steep wooded slopes just below dry ridge and shrubby growth, Ptaritepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 59996.*

Piper subalpinum Yuncker, sp. nov.

Suffrutex 1-2 m. altus; internodiis superis conferte retrorseque brunneo-hirtulis; foliis lanceolato-ovatis, 5-7 cm. latis, 12-19 cm. longis, apice sensim acuminatis, basi aequilateraliter rotundatis, supra glabris, venis subtus adpresse hirtulis, a medio deorsum pinnatim venosis; petiolo 5-15 mm. longo conferte hirtulo, ad laminam vaginato-alato; spicis 5 mm. crassis, 5 cm. longis; pedunculo 15 mm. longo hirtulo; bracteis triangulari-subpeltatis, margine fimbriatis; fructu subgloboso; stigmatibus sessilibus.

A branching soft-wooded subshrub 1-2 m. tall; upper internodes slender and rather short, densely retrorsely brown-hirtellous; leaves when living subcoriaceous to firmly membranous, rugose, dark green above, dull paler green beneath, lance-ovate, 5-7 cm. wide x 12-19 cm. long, apex gradually acuminate, base equilaterally rounded, pinnately nerved from below the middle, the nerves 4 on each side, impressed above, salient beneath, with prominent cross-connecting and anastomosing nervules, glabrous above, the nerves beneath appressed-hirtellous, drying coriaceous, subopaque, narrowly revolute; petiole from 5 mm. long above to 15 mm. long below, densely hirtellous, vaginate-winged to the blade; spikes erect-ascending, 5 mm. thick x 5 cm. long; peduncle 15 mm. long, hirtellous; bracts triangular-subpeltate, marginally fringed; fruit subglobose; stigmas 3, short, sessile.

Type in herb. Chi. Nat. Hist. Mus., collected on densely wooded slopes of narrow ridge between quebrada and summit, Sororopán-tepuí, state of Bolívar, alt. 2130-2250 m., November 15, 1944, *Julian A. Steyermark 60172.*

MORACEAE[14]

Cecropia kavanayensis Cuatr., sp. nov.

Arbor ramulis scabris copiose hamato-pilosis. Folia mediocria coriacea peltata petiolata. Petiolus robustus striatus albicans adpresse villosus et minute arachnoideus, basi subtus pulvinum brunneum dense tomentosum incrassatus. Lamina palmata profunde (2/3) 7-lobata, lobis subobovato-oblongis apice obtusis basi angustatis, margine integra vel levissime sinuata; lobo maximo ab insertione petioli usque ad apicem 28 cm. longo et 15.5 cm. lato, lobo minimo 12 cm. longo et 6.5 cm. lato, parte centrali concrescenti 7-8 cm. radii; supra atroviridis conspectu glabra sed sparsissimis tenuissimis pilis araneosis munita, nervis primariis et secundariis conspicuis tertiariis transversis obsoletis superficie sub lente minutissime irreguliterque reticulato-alveolata vel rugulosa; subtus sericeo-cinerea nervis primariis crasso-eminentibus roseis laxe strigosis vel araneosis, nervis secundariis prominentibus roseis ascendentibus circa 1.5 cm. distantibus, laxe araneosis, tertiis transversis 2-3 mm. distantibus bene conspicuis, inter eos superficie dense cinereo-arachnoideo-tomentosa.

Inflorescentiae masculae geminatae. Pedunculus rigidus crassus valde brevis, dense tomentoso-hirsutus, 1-2 cm. longus. Spatha 8.5 cm. longa, cylindrico-oblonga apice abrupte acutata breviter apiculata, extus dense albido-villosa intus glabra sed sparsissimis pilis arachnoideis visibilis. Amenta masculina circa 10 pedicellata, 4-6 cm. longa maturitate in sicco 4-5 mm. crassa. Perianthium prismatico-pyramidatum 6 farium striatum 1.5 mm. longum, costis apiceque minute hirsutulum. Pedicelli robusti rigidi basi in ad modum annulum crassum 3-5 mm. altum coaliti, parte libera crassa 3-7 mm. longa, breviter tomentulosi et hirsutuli.

Type in herb. Chi. Nat. Hist. Mus., collected on wooded slopes of Quebrada O-paru-ma', between Santa Teresita de Kavanayén and Río Pacairo (tributary of Río Mouak), state of Bolívar, alt. 1065-1220 m., November 20-21, 1944, *Julian A. Steyermark 62754.*

This interesting species is related to *C. obtusa* Trecul., but differs from it chiefly by the smooth upper side of the leaves. The same character differentiates if from *C. solanoensis* Pitt. Other very typical features of *C. kavanayensis* are the short peduncles of the male inflorescences, the thick pedicels which are concrescent at the base, and the rigid, coriaceous leaves.

Pourouma Steyermarkii Standley et Cuatr., sp. nov.

Arbor 14 m. alta. Ramuli subteretes pallido-virides cicatricibus stipularum annularis parum obliquis, cicatricibus foliorum depresso-

[14] By José Cuatrecasas

ovatis 3-4 mm. latis, internodiis 1-1.5 cm. longis striolulatis hirsutis. Stipulae terminales caducae 3-4 cm. longa oblongo-lanceolata, subvilloso-hirsuta, subnitida.

Folia integra parva alterna coriacea petiolata. Petiolus 5-6 cm. longus angustus sed robustus basi apiceque subite incrassatus breviter denseque hirsutus patulus. Lamina ovato-acuminata basi obtuse cuneata apice breviter cuspidata, 8-12 cm. longa, 4-6.5 cm. lata, margine brevissime sinuata vel conspectu integra; supra viridis, in sicco viridi-grisea, scabra pilis cornicis acutis basi callosis copiosis et pilis simplicibus tenuis longioribus sparsissimis munita, costa conspicua hirsutula, nervis secundariis ascendentibus minus conspicuis, tertiariis obsoletis; subtus costa crassiuscule eminenti subsericeo-hirsuta, nervis secundariis 6-7 utroque latere ascendentibus angulo acuto prominentibus subsericeo-hirsutis submarginem angustioribus arcuato-anastomosatis, venulis transversis crebris prominulis subsericeis cum alteris venulis tenuioribus obsoletum reticulum formantibus, costa nervis venulisque subsericeo-hirsutis inter hos reliqua superficie pilis tenuibus arachnoideis tomentum cinereum formantibus tecta.

Inflorescentiae femineae cymosae ad terminationes ramorum axillares longe pedunculatae pauciflorae. Pedunculi graciles sed ridigi dense hirsuti 4-5 cm. longi. Saepe 3 ramulis centrale unifloro lateralibus 5-15 mm. longis crassiusculis hirsutis 3-4 flores ferentibus. Pedicelli crassi hirsuti breves 2 mm. longi. Perianthium femineum ovato-ellipticum utriculosum 4 mm. longum, dense velutinum. Stigma peltato capitatum tomentosum. Capsula ovata apice acuta circa 12 mm. longa, et 6 mm. lata, pericarpio coriaceo-lignoso, perianthio carnoso griseo-viridi eduli inclusa.

Type in herb. Chi. Nat. Hist. Mus., collected in the lower south-facing slopes of Mount Ptari-tepuí between Río Karuai and first ridge above Río Karuai, state of Bolívar, alt. 1220 m., November 28, 1944, *Julian A. Steyermark 60665*, "tree 40 feet tall, leaves firmly membranaceous, deep green above, gray below, fruit gray green, edible".

Local name: "caibari-cai-yek".

This new species is well characterized by its small, entire, thinly coriaceous leaves which are cuneate at the base and acuminate at the apex; they are rough, scabrous on the upper side and cinereous beneath. *Pourouma Steyermarkii* is similar to *P. Mildbraediana* St. and *P. umbellata* St. of the Amazonian basin, but the above cited characters differentiate it from them. *Pourouma Mildbraediana* has larger, thicker, stronger nerved leaves which are cordate or rotundate at the base, and *P. umbellata* has smooth leaves on the upper side, which are larger and thicker with more numerous, acute angled, and stronger, sericeous nerves beneath.

Pourouma Cucura Standley and Cuatr., sp. nov.

Arbor mediocris. Caulis 30 cm. diam. cortice badi vel grisei, sub-

laevi, ligno pallido. Ramuli terminali subteretes internodiis brevibus dense hispidis pilis longis rigidis patentibus siccitate flavis copiose obtectis. Folia simplicia alterna coriacea petiolata. Petiolus longus mediocriter robustus patulis leviter striatus copiosis pilis longis flavis patulis munitis, basi subite incrassatus, 4.5-8 cm. longus. Lamina ovata basi rotundata vel subtruncata vel obtusissime cuneata, apice late obtusa, margine leviter repando-crenata, 10-15 cm. longa, 6.5-11.5 cm. lata, supra pallide viridis sublaevis longis pilis tenuis rectis basi minute callosulis sparsis munita, costa magis villosa et nervis secundariis conspicuis tertiariis obsoletis; subtus cinerea costa crasse elevata hirsuta, nervis secundariis prominentibus 7-9 utroque latere ascendentibus angulo acuto flavo-hirsutis prope marginem tenuioribus arcuatis anastomosatis, venulis transversis copiosis prominulis cum alteris tenuioribus in reticulo anastomosatis, pilos longos rigidos sparsos ferentibus et dense tomento lanato-araneoso reliquam laminam obtecto velatis. Stipulae subcoriaceae 3.5 cm. longa obtusiusculae densissime hirsuta.

Inflorescentiae femineae paniculatae pluriforae axillares ad terminationes ramorum quam folia valde breviores. Pedunculus 4.5 cm. longus rigidus rectis patentibus dense longissime hispidus. Ramuli 1.5-5 mm. longi crassiusculi plus minusve flexuosi hirtuli. Pedicelli breviter hirsutuli crassiusculi recti vel arcuati, 2-4 mm. longi. Perianthium femineum ovatum utriculosum breviter hirsutulum. Stigma capitatum tomentulosum subsessile. Capsula ovato-elliptica apice obtusa circa 9-10 mm. longa, 5-6 mm. lata, pericarpio coriaceo-lignoso, perianthio carnoso nigrescenti sapido inclusa.

Type in herb. Chi. Nat. Hist. Mus., collected at Capihuara Casiquiare, Territorio Federal Amazonas, alt. 118 m., May 6, 1942, *Llewelyn Williams 15812*, "nom. vulg. Cucura. Arbol de tamaño mediano o moderadamento alto con corona abierta; el tronco con varias raíces superficiales o adventicias y el tronco cilíndrico, erecto, 30 cm. diam., sin ramas por la mitad de la altura; la corteza de color castaño claro o grisáceo, algo lisa y el líber colorado a obscuro; la madera también de color claro, moderadamente blanda y facíl de cortar; el fruto ovoideo, de color oscuro, casi negro, contiene una pulpa comible y de sabor dulce; el liber exsuda resina de color oscuro o negruzco; hojas de color verde pálido tirando a gris por debajo; en la selva de tierra firme en los chiquichiquiales".

Pourouma Cucura is a well marked species distinguished chiefly by its long shaggy branchlets, petioles, and inflorescences.

Coussapoa Steyermarkii Cuatr., sp. nov.

Arbor epiphytica trunco circa 30 cm. diam. Ramuli brunnei-grisei juveniles dense tomentoso ferrugineo-hirsuti.

Folia simplicia integra alterna petiolata crasse coriacea. Petiolus robustus 10-15 mm. longus dense hirsutus, supra planiusculus subtus striatus apice subarticulatus. Lamina obovata basi obtuse cuneata

apice obtusa vel rotundata margine laevis leviter revoluta, 4.5-9 cm. longa, 2.8-6.5 cm. lata; supra atro-viridis nitida, siccitate ochraceo-viridula opaca, nervis medio secundariisque argute impressis reliquis obsoletis; subtus luteolo-viridis nervis ferrugineis, in sicco ochraceo-ferruginea, nervo medio secundariisque 3-4 utroque latere, acute ascendentibus prope marginem arcuato anastomosatis valde crasse prominentibus, subsericeo-hirsutis ferrugineis, nervulis transversis satis crebris horizontalibus valde elevatis cum venulis minus prominulis reticulato-anastomosatis, copiosis pilis longis simplicibus vel furcatis plus minusve patentibus et intricatis tecta. Stipula crassiuscula, acutiuscula 10 mm. longe densissime subsericeo-hirsuta.

Inflorescentiae femineae 1-2-cephalae axillares, pedunculo 10-12 mm. longo. Capitulis ad 4 mm. diametro globosis. Perianthium obovoideo-angulatum glabrum. Semina nitida.

Type in herb. Chi. Nat. Hist. Mus., collected on the southeast-facing slopes of Mount Ptari-tepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 60002a*, "warembayek. Epiphytic tree with trunk 1 foot in diameter growing attached to trunk of 59999; leaves coriaceous, dark green and shining above with sulcate nerves, yellow green below with ferruginous nerves prominent below; stems, buds, petioles, and rachis ferruginous; flowers greenish."

Number 60679 collected at Río Karuai, 1220 m., alt., is sterile and probably represents the same species in spite of its leaves rotundate at the base.

Number 60364 of Santa Teresita de Kavanayén is another form with larger and acute leaves, but also sterile.

This species is typified by the hirsute-ferruginous branchlets and petioles and by its thick, coriaceous leaves which are hirsute-ferruginous below.

Coussapoa viridifolia Cuatr., sp. nov.

Arbor parva, 8 met. alta. Rami cortice griseo rugoso, valde juveniles ferrugineo-hirsuti.

Folia simplicia integra alterna petiolata coriacea. Petiolus 10-22 mm. longus, rigidus pubescens subtus leviter striatus supra sulcatus. Lamina obovato-oblonga basi paulo angustata obtusissima, apice obtusa vel rotundata, margine laevis plana vel, in sicco, leviter revoluta, 6-9 cm. longa, 3-5 cm. lata; supra viridis glabra, siccitate tabacinea, nervis medio secundariisque leviter impressis reliquis nervulis minutum reticulum prominulum formantibus; subtus costa crasse elevata, nervis secundariis prominentibus 5 utroque latere, angulo acuto ascendentibus prope marginem tenuioribus arcuato-anastomosatis, nervulis transversis prominulis, venulis minus elevatis reticulum minutum gracilem formantibus, nervis parce pubescentibus reliqua glabra. Stipulae breves villoso-hirsutae 4-7 mm. longae.

Inflorescentiae masculae axillares subterminales cymoso-paniculatae 2.5-4 cm. longae pluriflorae, pedunculis tenuibus rigidis patulis 15-25 mm. longis tomentuloso-puberuli, ramulis elongatis brachiatis graciles saepe 2-furcatis, 8-5 mm. longis, tomentellis. Pedicelli 2-7 mm. longi graciles tomentelli. Capitula globosa 2.5-3 mm. diam. fulva. Sepala facie glabra margine ciliata. Antherae maturitate subexsertae.

Type in herb. Chi. Nat. Hist. Mus., collected along mesa escarpment between Santa Teresita de Kavanayén and wooded quebrada about 8 kms. northwest of Kavanayén, alt. 1220 m., November 23, 1944, *Julian A. Steyermark 60456*, "small tree 25 feet tall; leaves subcoriaceous, rich deep green above, pale green below; flowers buff-brownish, sap slightly milky".

This species is well characterized by its small obovate-oblong, subcoriaceous leaves which are obtuse at both ends, and glabrous except on the slightly hirtellous principal nerves beneath.

The most similar species, *C. orthoneura* St., and *C. cuneata* Miq., have thicker, larger, more or less acuminate leaves, not reticulate nerved; in this last species the male capitules are smaller too.

Coussapoa viridifolia var. **tenuifolia** Cuatr., var. nov.

Lamina foliorum membranacea obovato-oblonga basi obtusa apice rotundata breviter emarginata, 4-8 cm. longa, 2-4 cm. lata pallide viridis, nervis principalibus subtus parce hirtulis reliqua glabra, non elevato-reticulata.

Inflorescentiae femineae cymulis 1-2-cephalis, pedunculis 6-10 mm. longis, capitulis 2 mm. latis, perianthio glabro, stigmate penicillati exserto.

Type in herb. Chi. Nat. Hist. Mus., collected on Cerro Duida, on the southeastern-facing slopes along Caño Negro (tributary of Caño Iguapo), alt. 305-1095 m., August 25-26, 1944, *Julian A. Steyermark 57955*, "tree 40 feet tall; leaves firmly membranaceous, pale grass green above, pale green below; inflorescence pale green".

This variety of *C. viridifolia* substantially differs by its slightly smaller, more slender leaves which do not have an elevated venose-reticulum, and by the shorter inflorescences; these, being feminine, cannot be compared with those of the typical species.

Coussapoa Williamsii Cuatr., sp. nov.

Arbor parva terrestris vel epiphytica. Ramuli subteretes virides, in sicco brunnescenti.

Folia simplicia integra alterna petiolata coriacea. Petiolus 3.5-5 cm. longus glaber striatus. Lamina subobovato-oblonga basi attenuata obtusa apice angustata cuspidata, margine levissime crenato-sinuata vel laevis leviter revoluta, 10-13 cm. longa, 4-7 cm. lata; supra in sicco luteolo-viridula vel brunnescens, glabra costa promi-

nula nervis secundariis notatis, superficie minutissime rugulosoreticulata punctato depressa vel adultioribus sublaevi; subtus costa crassa elevata striata parce puberula, nervis secundariis 5-7 utroque latere prominentibus ascendentibus ad marginem curvato anastomosatis, parce puberulis vel in adultis glabris, nervulis transversis subimmersis depressis tenuiter conspicuis inter eos venulis minutum reticulum subtus microscopium visibilem formantibus, epidermo inter lineas reticulorum minute bullato-elevato et praecipue in statu juvenile minutissime hirtula adultiore glabra. Stipulae cylindraceo-lanceolatae 2.5 cm. longae acutae pubescentes.

Inflorescentiae masculae cymoso-paniculatae pluriflorae, axillares subterminales 3-4 mm. longae, pedunculo tenui puberulo ramulis divaricatis plus minusve flexuosis puberulis vel tomentellis, pedicellis teneribus 1-4 mm. longis. Capitula subglobosa 2-3 mm. lata. Perianthium glabrescente apice minute sparseque puberulum. Antherae subexsertae.

Type in herb. Chi. Nat. Hist. Mus., collected in the Upper Orinoco river at Esmeralda, Territorio Federal Amazonas, alt. 143 m., May 14, 1942, *Llewelyn Williams 15240 & 15363*.

Closely related to *C. cuneata* Miq., which has thicker, coriaceous leaves, tomentulose or arachnoid beneath, smaller male capitules, longer pedicels, and long exserted anthers. *Coussapoa cornifolia* Standl. has the under side of the ovate acute leaves tomentulose, somewhat smaller capitules, and exserted anthers. *Coussapoa orthoneura* Standl. has more acute ascending nerves of the leaves, smaller male capitules, and different structure of the epidermis of the lower side of the leaf, which is more or less tomentulose and arachnoid, although in the old state can be nearly glabrous, but, by means of a microscope, the epidermis is seen to consist of minute spreading hairs with rather depressed alveoles between the reticulum. The more lanceolate stipules, which are only slightly pubescent, differentiate *C. Williamsii* from the above cited species.

Pseudolmedia rigida (Kl. & Karst.) Cuatr., comb. nov.

Olmedia rigida Klotsch & Karsten. Linnaea **20**: 524. 1847.

MONAGAS: forested southwest-facing slopes of Cerro Negro, above La Sabana de las Piedras, northwest of Caripe, alt. 1500 m., April 5, 1945, *Julian A. Steyermark 61846*, "tree 80 feet tall; wood very hard; latex creamy-yellow; leaves chartaceous-subcoriaceous, dark green and shining above, dull green below". ANZOÁTEGUI: forested slopes of Montaña de las Palomas, tributary of Río Neverí, between "Carmelita" and "Natalia", northeast of Bergantín, alt. 900-1000 m., March 23, 1945, *Steyermark 61447*, "tree 25 feet tall; leaves chartaceous-firmly membranaceous, dark green above, dull green below; flowers dull green". Headwaters of Río Maravilla, slopes of Fila Grande between Los Chorros and Cerro Negro, east of Bergantín, alt. 900-1400 m., March 23, 1945, *Steyermark 61714*, "tree

30 feet tall, slender with oblong shape; leaves firmly membranaceous-chartaceous, deep green above, dull pale green below".

Local name: "chara".

URTICACEAE[15]

Pilea venosa Killip, nom. nov.

Pilea succulenta Wedd. Arch. Mus. Hist. Nat. [Paris] 9: 256. 1856, not Hook. f., 1847.

MONAGAS: Cerro de la Cueva de Doña Anita, valley of Caripe, alt. 1100 m., *Julian A. Steyermark 61896.* ANZOATEGUI: confluence of Río León with Río Zumbador, northeast of Bergantín, alt. 400-500 m., *Steyermark 61215* ("guritoto colorado").

This species was based upon Funck's 145, and in my revision of the Andean species of *Pilea* (Contr. U.S. Nat. Herb. **26**: 509. 1939) was tentatively treated as a synonym of *P. mollis* Wedd., a plant of north-central Venezuela. The type locality was given by Weddell as "In terras caracasanis, prope Gucharosa" in the "Archives" and as "In ditione Caracas, prope Guacharos" in DC. Prodromus **16**, pt. 1: 150. In all probability this is Guacharo, situated in Monagas, between the Cerro Turumiquire and Caripe. Steyermark's material shows that this species is clearly distinct from *P. mollis*. The stipules are larger and more persistent than in *P. mollis;* the cystoliths, though slenderer, are far more numerous; and the pedicels of the staminate flowers are proportionately shorter.

[15] By E. P. Killip

PROTEACEAE

Euplassa Glaziovii (Mez) Steyerm., comb. nov.

Adenostephanus Glaziovii Mez, in Engl. Bot. Jahrb. **30**, Beibl. 27: 10. 1890.

Euplassa obversiflora (Mez) Steyerm., comb. nov.

Adenostephanus obversiflorus Mez, in Engl. Bot. Jahrb. **30**, Beibl. 27: 9-10. 1890.

Euplassa saxicola (Schultes) Steyerm., comb. nov.

Roupala saxicola Schultes, Leafl. Bot. Mus. Harv. Univ. **13**: no. 10: 300-301. 1949.

The pinnately compound alternate leaves with opposite leaflets, and the flower structure definitely place this in the genus *Euplassa*.

Euplassa venezuelana Steyermark, sp. nov.

Arbor 9 m. alta; ramulis tenuiter adpresso-pubescentibus; petiolis cum rhachibus 17-19 cm. longis, adpresso-fulvo-pubescentibus; foliolis 2-4-jugis, oppositis, coriaceis, ovali-oblongis vel obovatis, basi obtusis, apice tenuiter vel profunde obcordatis vel emarginatis, integerrimis, supra nitidis glabris grosse reticulatis, subtus pallido-viridibus parce minute adpresso-pilosulis tenuiter reticulatis, pilis pallidis, 5.5-10 cm. longis, 3.5-6 cm. latis; petiolulis 9-10 mm. longis, adpresso-fulvo-pubescentibus; racemis terminalibus et axillaribus simplicibus, 15-25 cm. longis, 2-3 mm. crassis, rhachi dense adpresso-ferrugineo-tomentosis; pedicellis 1.5-3 mm. longis, dense adpresso-ferrugineo-tomentulosis; calyce subirregulari subclavato-cylindrico curvato; sepalis 4 apice concavo staminiferis, 9-11 mm. longis, extus parce adpresso-fulvo-tomentulosis, intus glabris; a heris subsessilibus ovatis, 1.8-2 mm. longis; glandulis hypogynis connatis, marginibus paullo lobatis vel undulatis, 1.5 mm. altis, glabris, uno latere lobato profundiori; ovario parce tomentoso, 2.5 mm. longo, ad glandulam adnato; stylo erecto robusto glabro, 4-5 mm. longo; stigmate clavato compresso 2 mm. longo (Fig. 42, a-b-c).

Type in herb. Chi. Nat. Hist. Mus., collected along Río Karuai, northwest of Santa Teresita de Kavanayén, state of Bolívar, alt. 1220 m., November 30, 1944, *Julian A. Steyermark 60824*, "tree 30 feet tall; leaves coriaceous, deep green and shining above, pale green below; rachis and peduncle ferruginous-brown; corolla buds brownish or olive green without".

This species is related to *E. Glaziovii* (Mez) Steyerm. and *E. obversiflora* (Mez) Steyerm. From the former it differs in having 4 pairs of leaflets deeply emarginate at apex, the lower leaf surface pilosulous instead of glabrous, and the relatively shorter pedicels in proportion to the length of the flowers. From the latter, *E. venezuelana* differs in the more densely ferruginous appressed tomentum

of the rachis of the petiole, peduncles, and branchlets, and the entire margins of the leaflets.

Panopsis ptariana Steyermark, sp. nov.

Frutex 1.1-1.8 m. altus; ramulis junioribus cum petiolis parce

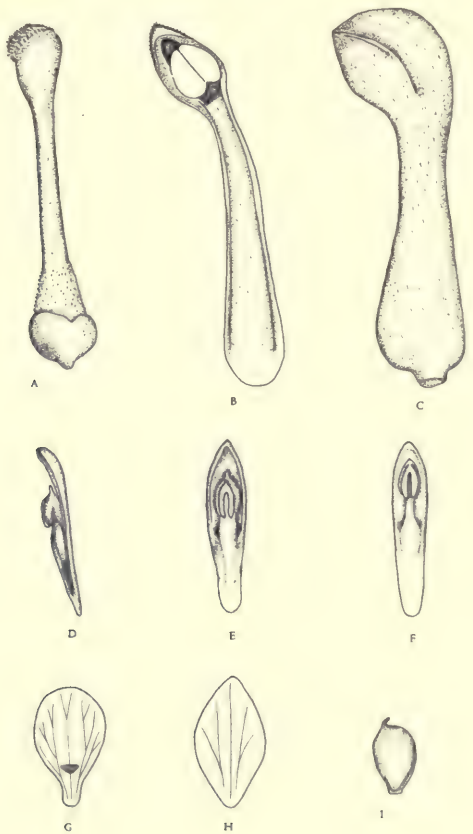

FIGURE 42

A, *Euplassa venezuelana*. Pistil (X 5); B, *Euplassa venezuelana*. Perianth segment, ventral view, showing anther (X 5); C, *Euplassa venezuelana*. Single flower, unopened (X 5); D, *Phthirusa ptariana*. Petal with attached stamen, lateral view (X 3); E, *Phthirusa ptariana*. Petal with attached stamen, ventral view (X 3); F, *Phthirusa ptariana*. Petal with attached stamen, ventral view, filament more elongate (X 3); G, *Ranunculus limoselloides*. Petal (X 4); H, *Ranunculus limoselloides*. Sepal (X 4); I, *Ranunculus limoselloides*. Achene (X 3).

addresso-pilosulis; foliis oppositis subcoriaceis subtus pallido-viridibus in sicco flavido-vel olivaceo-viridibus utrinque prominente pulchre areolato-reticulatis obovato-oblongis basi obtusis apice rotundatis, laminis 4-6 cm. longis, 1.7-3 cm. latis, specie glabris sed cum microscopo pilis pallidis adpressis obtectis, petiolis 2-3 mm. longis parce adpresso-pilosulis; racemis terminalibus 3-fasciculatis simplicibus 4-6 cm. longis, 12-15 mm. latis; rhachi 4-6 cm. longo, ferrugineo-tomentoso; pedicellis divaricate patentibus 4-5 mm. longis, ferrugineo-pubescentibus; sepalis 4.5-5 mm. longis planis revolutis intus glabris extus pilosulis ferrugineis; filamentis 3.5-4 mm. longis glabris sepalis brevioribus; squamulis hypogynis 0.6-0.7 mm. longis in urceolum quadridentatum connatis, dentibus 0.2 mm. longis; ovario ovato superne angustato ferrugineo-hirsutulo; stylo et stigmate flavido.

Type in herb. Chi. Nat. Hist. Mus., collected on dry sandy and rocky sandstone exposures on level ground adjacent to swamp on plateau-portion of southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59677*, "shrub 4-6 feet tall; leaves subcoriaceous, deep green above, pale green below, areolate-reticulate-veined; pedicels and calyx and ovary ferruginous; style and stigma yellow".

This species is closely related to *P. multiflora* (Schott) Taub. (*Andripetalum multiflorum* Schott and *Andripetalum reticulatum* Pohl), but differs from that in having more slender, unbranched racemes with simple or ternate peduncles, shorter, more rigidly divaricate-spreading pedicels, more finely areolate-reticulate and paler green leaves, hairs on the ovary longer, hairs on the leaf surface longer and of a paler buff color instead of white, and in the hypogynous squamellae, which in *P. multiflora* have longer teeth 0.5 mm. long and longer glands 0.9-1 mm. long.

Panopsis tepuiana Steyermark, sp. nov.

Arbor 19-22 m. alta; ramulis novellis ferrugineo-tomentellis; foliis alternatis vel oppositis coriaceis, supra nitidis viridibus, adultis subtus pallidioribus, junioribus subtus pallido-ferrugineis, oblanceolatis vel elliptico-oblanceolatis, basi angustatis, apice subobtusis apiculatis, supra minute reticulatis, subtus tenuiter reticulatis et dense minute rubentibus vel ferrugineo-pilosulis ad nervum medium praecipue, laminis 8.5-15 cm. longis, 2-5 cm. latis; petiolis 8-15 mm. longis, rubentibus vel ferrugineo-tomentellis; racemis terminalibus simplicibus vel ramosis, 6.5-8 cm. longis, dense ferrugineo-tomentosis; pedicellis 1.5-3 mm. longis dense rubentibus vel ferrugineo-tomentosis; sepalis rubentibus lineari-spatulatis obtusis recurvatis intus glabris extus ferrugineo-tomentosis, 3.5-5 mm. longis, 0.5 mm. latis; antheris oblongis abrupte appendiculatis; filamentis plerumque liberis, parte liberi 1.5-2 mm. longo, glabris; squamellis hypogynis 0.5 mm. altis, tenuiter lobatis rotato-connatis; ovario dense ferrugineo-hirsutulo; stylo glabro erecto, 2-2.2 mm. longo; stigmate clavato.

Type in herb. Chi. Nat. Hist. Mus., collected on southeast-facing slopes, Ptari-tepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 59988* (2 sheets), "tree 60-70 feet tall; leaves coriaceous, deep green and shining above, dull paler green below on older leaves, pale ferruginous below on young leaves; rachis, pedicels, and sepals orange-ferruginous; petals recurved, creamy-yellowish within; style and stigma pale green; fruit edible".

Local name: "para-ma-yek".

This species is similar to *P. rubescens* (Schott) Ducke, from which it differs in the shorter inflorescence, shorter pedicels, more densely ferruginous tomentum of the stems, flowers, and lower leaf surface, shorter styles, and in the hypogynous gland which is shorter and not 4-dentate.

Roupala minima Steyermark, sp. nov.

Frutex 0.8-1.1 m. altus; ramis solitariis infra simplicibus glabris; foliis adscendentibus, utrinque caeruleo-viridibus, coriaceis subsessilibus elliptico-oblongis vel suborbicularibus, basi angustatis vel rotundatis, apice obtusis vel rotundatis, integerrimis, marginibus incrassatis, omnino glabris, subtus nervo medio et nervis lateralibus paullo prominentibus vel inconspicuis, supra plus minusve inconspicuis, laminis 13-30 mm. longis, 7-25 mm. latis; petiolis glabris, 1-2 mm. longis, racemis axillaribus vel terminalibus solitariis simplicibus, 5.5-9 cm. longis; rhachi glabro; floribus juvenilibus extus glabris; bracteis ovato-triangularibus subito longe attenuatis glabris, 1 mm. longis, 1 mm. latis; pedicellis glabris divaricate patentibus 1-3 mm. longis; ovario glabro; stylo tenui glabro in fructu ad 4 mm. longo; folliculis (maturis) coriaceis oblique oblongo-ellipticis basi substipitatis vel prominente attenuatis 20-28 mm. longis, 8-10 mm. latis.

Type in herb. Chi. Nat. Hist. Mus., collected in savana, vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepuí, state of Bolívar, alt. 1615 m., November 15-17, 1944, *Julian A. Steyermark 60234* (2 sheets), "shrub, single-stemmed, 2-4 feet tall; leaves ascending, coriaceous, blue-green both sides; rachis blue-green".

An unusually well-marked species, characterized by the low stature and stems simple and unbranched for three-fourths their length, and by the markedly small, crowded, ascending leaves, all of which combined impart a peculiar aspect to the plant.

Roupala sororopana Steyermark, sp. nov.

Frutex 1.2 m. altus; ramis in stato sicco purpureis glabris vel furfuraceis; foliis alternatis coriaceis supra glabris viridibus, subtus furfuraceis ferrugineo-suffusis (in sicco specie purpureis) glabrescentibus elliptico- vel ovato-oblongis basi obtusis, apice obtusis vel rotundatis, laminis 6-11.5 cm. longis, 2.5-7 cm. latis; petiolis 1.5-3 cm. longis, ferrugineo-furfuraceis (in sicco purpureis) obtectis vel

glabris; racemis axillaribus simplicibus 12.5-13 cm. longis, 1-2 mm. latis, rhachi minute ferrugineo vel partim glabrato; pedicellis patentibus 2.5-4 mm. longis, ferrugineo-tomentosis; sepalis 7-9 mm. longis, extus minute furfuraceis; staminibus 4; antheris lineari-oblongis 3 mm. longis cum appendiculo rotundato; filamentis 3/4 longitudine ad calycem adnatis, in parte superiori quadrans liberis, parte liberi 1 mm. longo; squamellis hypogynis 4 suborbicularibus, 0.2-0.3 mm. longis; ovario breviter ferrugineo-hirsutulo, 1.5-1.6 mm. longo; stylo erecto glabro, 4.6 mm. longo; stigmate clavato parum incrassato.

Type in herb. Chi. Nat. Hist. Mus., collected on rocky hematite exposures at west end, on summit, Sororopán-tepuí, state of Bolívar, alt. 2225-2255 m., November 13, 1944, *Julian A. Steyermark 60089*.

This is related to *R. obtusata* Kl. of Brazil and British Guiana, from which it may be distinguished by the tomentose pedicels and rachis of the inflorescence, the ferruginous scurfy tomentum on the lower leaf surface, as well as on some of the stems, petioles, and larger flowers.

LORANTHACEAE

Gaiodendron punctatum (Ruiz & Pavón) G. Don, var. **puracense** (H.B.K.) Steyermark, comb. nov.

Loranthus puracensis H.B.K. Nov. Gen. & Sp. **3**: 437. 1820; *Gaiodendron puracensis* (H.B.K.) G. Don, Gen. Syst. **3**: 432. 1834.

In his Flora of Peru, vol. **13**, part II, no. 2, p. 397, Macbride states for *G. puracense*, "Perhaps only a variety of *G. punctatum*, but slenderer and smaller in all its parts". I am in agreement with this statement, and therefore a reduction of this entity to varietal rank is necessary.

Knuth (Init. Fl. Venez., in Rep. Sp. Nov. Veg. **43**: 301. 1928) refers an *Ule* collection from Roraima to *G. punctatum*, but it is probable that it belongs to this variety *puracense* which the present author collected on Ptari-tepuí in the same general region. Pittier et al in the Catalogo de la Flora Venezolana, vol. **1**, p. 268, under *G. punctatum*, state that "el material que poseemos en el herbario bajo esto nombre, parece ser referible a la siguiente especie" (*G. Tagua*). Thus, outside of the *Ule* collection above cited, the following collection is the only Venezuelan material with deep yellow flowers that can be referred correctly to the *G. punctatum* group: "Growing 35 feet up on bluffs, along base of south-facing high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2410 m., November 6, 1944, *Julian A. Steyermark 59912*, flowers very fragrant, like exotic perfume; floral buds orange-yellow; style, filaments, and petals deep yellow, calyx pale green; leaves coriaceous or subcoriaceous, deep green above, pale green below; petals recurved in upper half; shrub 3 feet tall".

Phoradendron karuaianum Steyermark, sp. nov.

Frutex parasiticus furcatus, ramis oppositis pseudodichotomis vel cymosis teretibus, ad omnes nodos cataphyllis suffultis; internodiis 3-4 cm. longis; cataphyllis late deltoideo-triangularibus supra nodos 0.5-2 cm. insertis; foliis oppositis paullo falcatis vel symmetricis lanceolato-ellipticis vel elliptico-ovatis basim versus et ad apicem sensim attenuatis, laminis 5-8 cm. longis, 1-3.5 cm. latis, in stato sicco minute ruguloso-verruculosis, palmatim 3-nervosis basinerviis; nervis inconspicuis non elevatis; petiolis 2-4 mm. longis alatis; spicis axillaribus ad nodos plerumque solitariis tenuibus 2-3 cm. longis, 1.5-2 mm. crassis cataphyllorum, jugis 3 et articulis 3 tenuibus gerentibus; pedunculis 2-3 mm. longis; articulis 3 et 5-8 mm. longis, 12-16-floris, prophyllis superne minute papillatis; floribus 2-seriatis: masculis minoribus, in diametro 1-1.1 mm. ad quoquem articulum infra flores foeminineas; foemineis majoribus, in diametro 1.5-1.7 mm.; baccis oblongis laevibus 4 mm. longis, 2.5 mm. latis.

Type in herb. Chi. Nat. Hist. Mus., collected in dense forest at base of Cerro along Río Karuai, Ptari-tepuí, state of Bolívar, alt. 1220 m., November 27, 1944, *Julian A. Steyermark 60659.*

Local name: "atapi".

This is an exceptional species, belonging to the *Dichotomae* group, and apparently related to *P. laxiflorum* Ule of Amazonas, Brazil, from which it differs in its thicker, longer, less-pointed leaves and more densely-flowered spikes. From *P. Jenmani* Trel. it differs in the pointed leaves and more densely many-flowered spikes. Furthermore, from some members of section *Chrysocarpae* it differs from *P. haitense* Urban in the broader, shorter blades, oblong fruits, and more densely-flowered spikes. It is well characterized by the combination of densely-flowered slender spikes, the flowers in two ranks, the oblong fruits, and the palmately-nerved thickish leaves.

Phoradendron ptarianum Steyermark, sp. nov.

Frutex parasiticus, ramis oppositis dichotomis teretibus dioicis; cataphyllis tantum ad nodos basales ramulorum 1-jugis sterilibus late deltoideo-triangularibus, 1.5 mm. longis, supra nodos 1.5-4 cm. insertis; foliis oppositis crasso-coriaceis paullo falcatis elliptico-lanceolatis vel oblanceolato-oblongis basi angustatis, apice rotundatis vel obtusis, laminis 7-10 cm. longis, 1.5-4 cm. latis, in sicco minute ruguloso-verruculosis aereo- vel olivaceo-viridibus, marginibus plerumque albicantibus, penninerviis, nervis lateralibus inconspicuis; petiolis 12-25 mm. longis; spicis axillaribus ad nodos nonnullis olivaceo-viridibus, 1.2 cm. longis, 2-2.5 mm. crassis, cataphyllorum jugis 3-4 et articulis 4-5 gerentibus; pedunculis 2-3 mm. longis; articulis 4-5 et 5-6 mm. longis, 3 mm. latis, clavatis, 24-30-floris, floribus masculis (tantum visis) verticillatis 6-seriatis trimeris.

Type in herb. Chi. Nat. Hist. Mus., collected on forested south-facing slopes overlying sandstone, on "Cave Rock" above "Cave Camp", Ptari-tepuí, state of Bolívar, alt. 1810 m., October 29, 1944, *Julian A. Steyermark 59483*, "parasite on shrub; leaves coriaceous, bronze to olive green both sides; spikes or rachis dull olive green; stem terete, dull green".

From *P. undulatum* (Pohl) Eichler this species differs in its dioecious habit, longer petioles, prevailingly obtuse blades, and in the minutely papillate or suberose, instead of ciliolate, margins of the cataphylls. From *P. Uleanum* Steyerm. (*P. macrophyllum* Ule, not Cockerell)* of Mount Roraima, it differs in the obtuse, usually narrower blades, longer petioles, and crowded staminate flower spikes.

Phoradendron tepuianum Steyermark, sp. nov.

Frutex parasiticus furcatus, ramis oppositis dichotomis teretibus dioicis; internodiis 4-7 cm. longis; cataphyllis tantum ad nodos basales ramulorum 1- jugis sterilibus late deltoideo-triangularibus, 1 mm. longis, supra nodos 9-12 mm. insertis; foliis oppositis crasso-coriaceis late obovatis vel elliptico-obovatis basi subito attenuatis, apice rotundatis, laminis 3-6 cm. longis, 3-5 cm. latis, in sicco minute ruguloso-verruculosis aereo-olivaceo-viridibus novellis apicalibus leviter penninerviis adultis costa tantum basi manifesta, costae residuo et nervis lateralibus plerumque obsoletis; petiolis 7-10 mm. longis; spicis axillaribus ad nodos nonnullis lutescenti-viridibus 2.5-5 cm. longis, 4-5 mm. crassis cataphyllorum jugis 4-5 et articulis 5 gerentibus; pedunculis 1-3 mm. longis; articulis 5 et 3-10 mm. longis, 2.5-5 mm. latis, clavatis, 10-16-floris, prophyllis 3-4 mm. longis apice papillato-ciliolatis, floribus foemineis (tantum visis) 4- vel 4+2-seriatis; baccis oblongo-ovoideis 5 mm. longis.

Type in herb. Chi. Nat. Hist. Mus., collected on dry sandy and rocky sandstone exposures on level ground adjacent to swamp on plateau-portion of southeast-facing slopes, Ptarí-tepuí, state of Bolívar, alt. 1600 m., November 1, 1944, *Julian A. Steyermark 59688*, "parasitic on shrubs; leaves coriaceous, bronze olive-green; rachis and flowers yellow-green".

Apparently a member of section *Penninerviae* and related to *P. Northropiae* Urban of the Bahamas and to *P. Warmingii* Eichl. of Brazil. From the latter it differs in the terete stems and more numerous joints of the flowering spikes, while from the former it differs in the stouter, longer spikes and stouter branches. In some respects this new species resembles *P. Macbridei* Standl. of Peru, but that

*__Phoradendron Uleanum__ Steyermark, nom. nov.

Phoradendron macrophyllum Ule, Notizbl. Bot. Gart. Berl. **6**: 291. 1915, not *Phoradendron macrophyllum* Cockerell, Am. Nat. **34**: 293. 1900.

has only 4-seriate flowers and the leaves are smaller and of a different shape.

Phthirusa adunca (Meyer) Maguire, var. **orinocensis** (Spreng.) Steyerm., comb. nov.

Loranthus orinocensis Spreng. Syst. **2**: 129. 1828; *Phthirusa orinocensis* Eichl., in Mart. Fl. Bras. **5**[2]: 60. 1868.

Phthirusa ptariana Steyermark, sp. nov.

Scandens parasiticus lignosus glaberrimus; ramis subangulatis cortice in adultis cinereo; foliis coriaceis supra oliveo-viridibus subtus pallido-viridibus, elliptico-ovatis vel late ellipticis, basi angustatis vel rotundatis, apice acuminatis, 7-12 cm. longis, 2-5.5 mm. latis, nervo medio prominenti; petiolis 1.5-2.5 cm. longis; spicis in paniculam terminalem dense ramosam dispositis, 3-3.5 cm. longis, 3-3.5 cm. latis; pedunculis 3-4 mm. longis, ad 2.5 mm. crassis; floribus polygamo-dioicis aut hermaphroditis, 6-meris; calyce pallido-viridi 2 mm. alto, 2 mm. lato, leviter 2-3-dentatis, dentibus deltoideis minutis; petalis 6, pallido-viridibus, lineari-oblongis, 7 mm. longis, 1.5 mm. latis, intus papillosis, extus laevibus, anthesi aperte patentibus; staminibus 6, alternatim diversis; filamentis subalbidis superne liberis, parte liberi 1-1.5 mm. longa; antheris pallido-brunneis, late oblongis, ca. 2 mm. longis, eis staminium longiorum superne paullo rotundatis, staminium breviorum apiculatis; stylo 4.5 mm. longo; bacco oblongo, 13 mm. longo, 8 mm. lato (Fig. 42, d-e-f).

Type in herb. Chi. Nat. Hist. Mus., collected on densely forested steep south-facing slopes overlying sandstone, between "Cave Rock" and base of high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2100-2285 m., October 30, 1944, *Julian A. Steyermark 59549* (2 sheets), "parasitic, branching ligneous clinber; leaves coriaceous, olive green above, pale green below; perianth segments spreading horizontally in upper half, pale green; filaments whitish; anthers pale brown; calyx pale green".

This species is characterized by its large petals, congested short inflorescences, large fruit, and long petioles. It is apparently related to *P. adunca* (Meyer) Maguire.

Phthirusa roraimensis Steyermark, sp. nov.

Frutex parasiticus; ramis fuscis teretibus glabris lenticellosis et longitrorsum rimulosis; internodiis 1-2 cm. longis; foliis coriaceis utrinque olivaceo- aut aereo-viridibus, elliptico-oblongis vel late obcuneatis, basi angustatis, apice rotundatis aut subtruncatis vel emarginatis, saepe mucronatis, 2.5-5 cm. longis, 1-3.2 cm. latis, subtus nervis obsoletis, supra aut haud evidentibus aut 3-5 inconspicuis; petiolis 8-12 mm. longis; spicis axillaribus brevibus, 4-5 mm. longis (fructiferis 12 mm. longis), 6-8-floris; rhachi 12 mm. longo et in diametro 1 mm.; bracteis brunneis ovatis 2 mm. longis, 1 mm. latis; floribus lacteo-lutescentibus dioicis, calyce 1.8 mm. alto, 1.8

mm. lato, glabro, 2-dentatis, dentibus late deltoideo-triangularibus, acutis, marginibus irregulariter undulatis vel erosis; petalis 5-6, lineari-oblongis, 6 mm. longis, 1 mm. latis; staminibus 5-6 alternatim diversis; filamentis 0.3-0.4 mm. longis, glabris prope apicem petalorum insertis; antheris suborbiculari-oblongis, 1 mm. longis, ad extremitates utrasque rotundatis; baccis caeruleo-viridibus, oblongo-ovoideis, 7 mm. longis, in diametro 5 mm.

Type in herb. Chi. Nat. Hist. Mus., collected on southwest-facing forested slopes between Rondón Camp and base of sandstone bluffs, Mount Roraima, state of Bolívar, alt. 2040-2255 m., September 30, 1944, *Julian A. Steyermark 58943*, "parasite on *58944*; leaves coriaceous, olive green to bronze both sides; perianth creamy yellow"; same locality, *Steyermark 58965*, "fruiting plant of same species as *58943*; fruit dull blue-green".

This species is perhaps related to *P. clandestina* Mart., from which it differs in the shape and size of the leaves, size of flowers and stamens, and terete rather than angulate branchlets. From the group to which *P. micrantha* Eichl. belongs, it differs in its 5-6-merous, instead of 4-merous, flowers, while from *P. guyanensis* (Kl.) Eich. it may be distinguished by the glabrous branchlets, and non-furfuraceous leaves and branches.

SANTALACEAE

Thesium tepuiense Steyermark, sp. nov.

Herba annua, 25-30 cm. alta; caulibus simplicibus vel inferne ramosis, ramis paucis angulosis rigidis, in diametro 1.5-2 mm.; foliis ovato-lanceolatis, acuminatis, adpressis, minutis, ad 2 mm. longis; spicis congestis simplicibus, bifurcatis, vel cymoso-paniculatis dispositis; floribus luteo-albidis, proximis, congestis, sessilibus; bracteis et bracteolis ovatis acuminatis, ad margines inferiores minute denticulatis, 1.5 mm. longis; perigonio in anthesi subcylindrico, 3.8-3.9 mm. longo, tubo 1.8-1.9 mm. longo ovoideo angulato, laciniis 5 anguste oblongis vel lineari-oblongis, obtusis, 2 mm. longis, 0.5 mm. latis, margine inflexo, apice subcucullato, minute obtuse appendiculato, intus et ad margines pubescentibus, pilis papillatis brevibus et longis; staminibus 5 laciniis oppositis, filamentis ca. 1 mm. longis, subulatis arcte adpressis quam antheris paullo longioribus; antheris ovato-oblongis vel ovatis, 0.5 mm. longis; ovario in fundo tubi globoso; stylo quam perigonio paullo breviori; stigmate capitato obtuso simplice; nuce ovoidea, 3.5 mm. longa, 2.25 mm. lata, angulatis, nerviis 5-9 validis, nervulis obliquis transversisque.

Type in herb. Chi. Nat. Hist. Mus., collected on savanna, vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepui, state of Bolívar, alt. 1615 m., November 15-17, 1944, *Julian A. Steyermark 60237*.

This remarkable species is the first of the family Santalaceae to be discovered in the area of the table-mountains of Venezuela. In its annual habit it resembles *T. brasiliense* DC., but differs from that species in its more robust, but shorter, simple or sparsely branched angulate stems, closely crowded inflorescences with larger, more conspicuous bracts, and somewhat larger fruits. From the only other known South American species *T. aphyllum* Mart., it is at once distinguished by the annual roots, smaller flowers with shorter perianth lobes, and smaller fruits.

CARYOPHYLLACEAE

Arenaria venezuelana Briq. Ann. Conserv. Jard. Bot. Genève **XIII** and **XIV**: 383. 1911.

This name must replace *A. humifusa* Linden & Planch., 1863, not Wahlenberg, 1812. *Arenaria humifusa* Lind. & Pl., even if considered to have been effectively published (See Sprague in Kew Bull. **1926**: 32-44. 1926), still remains a later homonym, and cannot be used, since it is antedated by *Arenaria humifusa* Wahlenberg, Fl. Lapp. 129. 1812. This latter name was legitimately published, and is discussed by Nordhagen in Bergens Museum Arb. **1**: 24. 1935.

In publishing his *A. venezuelana*, Briquet uses the same type number (*Linden 393*) as was used by Linden & Planch. for their *A. humifusa*. If Briquet had been aware of this situation, one would have supposed that he would have mentioned something about his species replacing that of Linden & Planch. Typical *A. venezuelana* has elongated stems with the leaves either all linear-lanceolate and crowded, or these mixed with broader elliptical-lanceolate ones. It varies in pubescence of stems, leaves, sepals, length and width of leaves, and in length of internodes.

The extreme depressed cespitose form of this species is **Arenaria venezuelana**, forma **Jahnii** (Blake) Steyermark, comb. nov.

Arenaria humifusa β Linden & Planchon, Trois. Voy. Linden **1**: 35. 1863; *Arenaria Jahnii* Blake, Contr. U.S. Nat. Herb. **20**: 35. 1863.

In the Catalogo Flora Venezolana, vol. **1**, p. 294, Pittier publishes *A. humifusa* var. *nana* Lind & Planch., but actually this name was never originally published by the authors as such. Linden & Planchon described (p. 35) under their *Arenaria humifusa* a certain "Forma β Nana, caulibus vix 2 centim. longis" and cite the collection of β as from "Alto del Paramo de Mucuchies. Alt. 3250-3900 metres. Linden, no. 1486". This latter form actually has never been taken up nomenclatorially, and Pittier merely adopted the first word of Linden & Planchon's description, misusing it as a name of their unnamed forma β. From an examination of the type specimen of *A. Jahnii* Blake, it is apparent that it is identical with and represents the *A. humifusa* forma β described above by Linden & Planchon. Moreover, when the type of *A. Jahnii* is compared with additional material from the

páramos in the state of Mérida, it is found to represent but a cespitose extreme form, grading by various degrees into *A. venezuelana*.

For example, *Steyermark 57518* from Laguna Mucubají, above Los Apartaderos, state of Mérida, matches well the type collection of *A. Jahnii*. Other collections (*Steyermark 55669* and *55738*) similarly relate themselves to this depressed páramo-inhabiting form. The type collection of *A. Jahnii* has small, detached portions of clumps with the pedicels protruding well above the tips of the leafy shoots. In *Steyermark 57518* similarly extended pedicels may be found when the clumps are broken into smaller portions. In other collections, such as *Steyermark 55669*, the pedicels are not as obviously extended and the leaves and stem appear more congested, but represent only a form of variation present in these cespitose matted growth forms. The minute puberulence near the apex of the pedicels, the glandular-papillosity in the grooves of the stem, and the sparsely ciliate base of the leaves can be found in varying degrees. In some cases, the leaves are more obviously ciliate at the base, while in others they are glabrate.

The description of forma *Jahnii* may be emended as follows: A typo (*A. venezuelana*) differt habitu caespitoso, caulibus brevissimis confertis plerumque glabris, foliis confertis rigidis brevioribus ovatis vel lanceolatis glabris vel basim versus minute ciliatis, sepalis plerumque glabris. Type in U.S. Nat. Herb., collected on Páramo de la Sal, state of Mérida, alt. 3400 m., September 2, 1921, *Alfredo Jahn 625*.

Other specimens examined are: MERIDA: Alto del Páramo de Mucuchíes, alt. 3250-3900 m., *Linden 1486*; Alto de Mucuchíes, La Tapa, cabeceras del Mifafi, entre Barro Negro y Torondoy, alt. 4500-4600 m., April, 1930, *Gehriger 106*; in dense clumps, on other side of páramo between El Aguila (top) and Apartaderos, along headwaters of Río Chama, páramo along upper headwaters of Río Tormero, below El Aguila and above Chachopo, alt. 3650-3965 m., March 13, 1944, *Steyermark 55669*; dense clumps, dry rocky gneissic-granitic slopes, between Timotes and Paramito, alt. 2285-3500 m., March 24, 1944, *Steyermark 55738*; mats, flowers, white, Laguna Mucubají, above Los Apartaderos, alt. 3525-2655 m., July 21, 1944, *Steyermark 57518*.

In general, this form is distinguished by its dense, compact, more cespitose habit, with more crowded and shorter stems, shorter and more crowded leaves, and shorter internodes. Usually its leaves are more glabrate than in typical *A. venezuelana*, the latter varying from sparsely to densely ciliate leaves, glabrate to densely ciliate and puberulent sepals, and glabrate to puberulent stems. The forma *Jahnii* represents an extreme variation of the species, growing in exposed situations, and marked by its habit of forming dense clumps.

Drymaria firmula Steyermark, sp. nov.

Herba, caulibus purpureis, rigido-adscendentibus glabris; inter-

nodiis quam foliis longioribus; laminis firmiter membranaceis, supra atroviridibus, infra valde nervatis, glabris, late ovatis, apice subacutis apiculatis, basi subcordatis vel cordatis, 3-8.5 mm. longis, 3-7 mm. latis; petiolis 1-1.5 mm. longis, glabris; stipulis conspicuis setaceis albis; floribus 3-6 in cymulas sat densas terminales dispositis; pedicellis erectis vel adscendentibus, 2-4 mm. longis, minute glandulosis; bracteis ovatis acutis glabris, 2.25-2.5 mm. longis; sepalis oblongo-lanceolatis acutis apiculatis conspicue 3-nerviis scariosis, 4.5 mm. longis, 1.5-2 mm. latis, glabris; petalis albis unguiculatis, ultra medium profunde bipartitis, 5 mm. longis, infra medium 0.75 mm. latis, lobis anguste ligulatis, 3-3.5 mm. longis, 0.8 mm. latis; staminibus 5; filamentis 3 mm. longis; antheris oblongis, 0.7 mm. longis, 0.3 mm. latis; ovario ovoideo, 1.9-2 mm. longo; stylo supra medium 3-partito; ovulis 6-7.

Type in herb. Chi. Nat. Hist. Mus., collected on Páramo de Los Colorados, between El Molino and San Isidro Alto, state of Mérida, alt. 2745-2955 m., May 14, 1944, *Julian A. Steyermark 56536*, "stems stiff-ascending, purple; leaves firm-membranaceous, dark green above; petals white".

This species is characterized by the short-petiolate, firmly membranaceous, glabrous, broadly ovate subcordate leaves, which are strongly nerved beneath, the stiff-ascending, glabrous, purple stems, the conspicuously setaceous white stipules, the glabrous strongly 3-nerved, acute sepals, and cymosely disposed flowers on short, erect, minutely glandular pedicels. It apparently is related to *D. nitida* Ball of Peru and *D. cordata* (L.) Willd., but differs from them in the combination of characters above given.

Stellaria ovata Willd., forma **paradoxa** Steyermark, forma nova.

Herba prostrata vel procumbens, caulibus plerumque pilosis, pilis multicellulis 1 mm. longis instructis; internodiis plerumque quam foliis longioribus; laminis firmiter membranaceis, late ovatis subiter acutis apiculatis, basi truncatis vel rotundatis ciliatis utrinque valde pilosis, 7-12 mm. longis, 5-10 mm. latis; petiolisnl-2 mm. longis, pilosis; floribus solitariis, axillaribus vel terminalibus; pedicellis 5-20 mm. longis, valde pilosis; sepalis 5, ovatis, obtusiusculis, 3-3.5 mm. longis, 1.5-2 mm. latis, extus parce pilosis; petalis 5, unguiculatis, bilobatis, sepala excedentibus, 5 mm. longis, in mediam 2 mm. latis, lobis ovato-oblongis obtusis 1.5 mm. longis 0.75-0.8 mm. latis; staminibus 10; filamentis 3.5 mm. longis; antheris suborbicularibus, 0.5 mm. longis; stylis 3-4, 1.8-2 mm. longis; ovario ovoideo, 2.5 mm. alto; ovulis pluribus.

Type in herb. Chi. Nat. Hist. Mus., collected in moist cloud forest, on southwest-facing slopes at Los Aposentos, above Las Sabanetas, above Humocaro Bajo, state of Lara, alt. 2500-2530 m., February 3, 1944, *Julian A. Steyermark 55217*, "sprawling on ground".

From typical *S. ovata* this differs in having all the vegetative parts

of the plant abundantly pilose with several-celled hairs up to 1 mm. in length. The leaves, stems, and pedicels are especially pilose, while the sepals are sparsely so without.

Stellaria venezuelana Steyermark, sp. nov.

Herba perennis, caulibus diffuso-patentibus vel erectis, ramosis, plerumque glabris; internodiis elongatis, inferioribus quam folia longioribus vel ea aequantibus, superioribus quam folia brevioribus vel longioribus; laminis membranaceis magnis, late ovatis vel cordatis apice longe acuminatis, basi cordatis vel subcordatis, supra praeter pauces pilos per costam glabris, infra parce pilosis secundum costam ceterum glabris, 15-45 mm. longis, 10-30 mm. latis, longe petiolatis; petiolis prominenter longe ciliatis praesertim basim versus, plerumque 12-37 mm. longis; floribus pluribus minimis in dichasiis valde compositis longissime pedunculatis; pedunculis gracillimis, 3.5-9 cm. longis, glabratis vel glandulari-puberulis, praesertim superne; bracteis late lanceolatis vel elliptico-ovatis, acuminatis, 3-5 mm. longis, 1.5-2.5 mm. latis; pedicellis tenuissimis, 5-10 mm. longis, dense glandulari-puberulis; sepalis 4, liberis, membranaceis, late ovatis, obtusiusculis scariosis 1-nerviis glabris, 1.5-2.5 mm. longis, 1 mm. latis; petalis 4, albis ligulato-oblongis obtusis, bilobatis, quam sepalis longioribus, 2-3.5 mm. longis, 1-1.5 mm. latis, lobis 1 mm. longis, 0.5 mm. latis; staminibus 5-6 quam petala brevioribus vel ea aequantibus; filamentis glabris; antheris suborbicularibus, 0.3 mm. longis; stylis 2, filiformibus, ad apicem recurvatis, 1 mm. longis; ovario 1-2 mm. longo; ovulis 4; semine maturo 1, fusco, lenticulari-reniformi, papillato-verrucoso, 1.5 mm. longo, 1.5 mm. lato.

Type in herb. Chi. Nat. Hist. Mus., collected in forest along stream at base of Cerro de Diablo (western extension of southern peak of Cerro Turumiquire), state of Sucre, alt. 2000-2100 m., May 11, 1945, *Julian A. Steyermark 62739;* also collected on Cerro Turumiquire, north-facing slopes above La Trinidad in cloud forest zone, southwest of Cocollar, state of Sucre, alt. 2100-2200 m., May 5, 1945, *Steyermark 62557*, "stems erect, sprangling and branching; leaves membranaceous, pale green below, dull green above; petals white"; and, in wet thickets, between El Cobre and Cordero, state of Táchira, alt. 1520-1820 m., July 8, 1944, *Steyermark 57121*, "sprawling on floor of dwarfed forest in shade; leaves thin; petals small, white"; also ad vias regionis subalpine prope coloniam Tovar, *Fendler 46, Moritz 1903.*

This distinctive species, characterized by its 2 styles, 4 sepals, 4 petals, 5-6 stamens, minute flowers arranged in a branched dichasial cyme, and long-petiolate large, cordate-ovate leaves, was at first believed to be conspecific with *S. micrantha* Spruce (in Rohrbach, Linnaea **37**: 280. 1871-73). That species, the type of which must be based upon the first-mentioned collection cited in the list of exsiccatae examined, namely, "in Andibus Ecuadorensibus (*Spruce*

6023!)", is described as having a 5-parted calyx, petals divided nearly to the base, and 10 stamens. Moreover, the blades of the leaves are either long-ciliate towards the apex or glabrate, whereas in *S. venezuelana* the blades are not ciliate. Other differences are found in the relative length of the sepals and petals, which are longer in the Ecuadorian *S. micrantha*, and in the pedicels, which are glandular-puberulent in *S. venezuelana*, whereas in *S. micrantha* they are described as being "pilosis". The *Fendler* and *Moritz* collections, from Colonia Tovar, Venezuela, cited by Spruce, are probably conspecific with the other three Venezuelan collections above cited, and to have included them, along with the Ecuador plant collected by Spruce, was an erroneous assumption.

While the usual condition within the genus is a flower with 5 sepals, 5 petals, 10 stamens, and 3, 4, or 5 styles, apparently the new species, together with *S. micrantha*, show greater affinity to Section *Pseudalsine* Boiss. (as treated by Pax & Hoffmann in Die Nat. Pflanzenf. **2, 16c**: 322. 1934) delimited by the Persian *S. alsinoides* and characterized by 4-merous flowers, 2 styles, and ovary with 4-6 ovules, and to Section *Oligosperma* Boiss., characterized by 5-merous flowers, 2 styles, and ovary with 4-6 ovules, and represented by three species of Asia.

RANUNCULACEAE

Ranunculus limoselloides Turcz., var. **Mandonianus** (Wedd.) Steyermark, comb. nov.

Ranunculus Mandonianus Wedd. Chl. And. **2**: 299. 1857.

Knuth, in his Initia Florae venezuelensis, lists *R. limoselloides* Turcz. for Venezuela (p. 329) with the note "Locus natalis ignotus". Pittier et al, on the other hand, in the Catalogo de la Flora Venezolana, do not mention this species. After a careful study of Turczaninow's original description (Bull. Soc. Imp. Nat. Moscou **27**: 275-276. 1854), it is evident that the plant described (based on *Linden 1441* from Venezuela) is identical with *Steyermark 57473* from the state of Merída (aquatic; leaves floating; in still pools in valley above Laguna Mucubají, above Los Apartaderos, alt. 3625-3655 m., July 21, 1944). It is well known that Linden made collections in the páramos and higher parts of the mountains in the state of Merída on his journey from Caracas to Colombia, and it is very probable that he collected this *Ranunculus* near or in the same locality in which the Steyermark collection was obtained. The significant parts of Turczaninow's description which are matched by the Steyermark collection are "foliis longissime petiolatis (natantibus ?) ovalibus vel subovato-oblongis integerrimis subtrinerviis, venoso-reticulatis;..... petala obovata (alba),....staminibus circiter 8". In the Steyermark collection 10 stamens are present, but, as will be seen in the following paragraphs, the number of stamens is apparently variable in this particular complex. The same entity is found in an adjacent region

of Colombia (*Cuatrecasas 1556* from Planos del Toldadero, Dept. of Boyacá), where the stamens are also 10 in number.

Proceeding southward in the Andes, there is encountered in Bolivia, under the name *R. Mandonianus* Wedd., a *Ranunculus* Which superficially resembles greatly the one from Venezuela and Colombia. In the original description of *R. Mandonianus*, based upon Mandon's collection from the Cordillera de Sorata, Bolivia, it was stated that the "staminibus sub-5". However, an examination of what is apparently an isotype specimen, preserved in the Herbarium of the Chicago Natural History Museum (sent originally as a duplicate from the Botanical Conservatory of Geneva, Switzerland), shows 15 stamens. Moreover, both this specimen, as well as a photograph of the supposed type (same collection as referred to above), exhibit much larger flowers than those found in the Venezuelan collection. In the Venezuelan (and Colombian) plants the stamens are actually less numerous (10-8) than in the Mandon collection cited, but are more than is given ("staminibus sub-5") in the original description. One wonders whether a typographical error of "5" instead of "15" may not have been made by Weddell in his original description. Be that as it may, the Venezuelan (and Colombian) collections have petals with a much broader but shorter blade, shorter ovate instead of broadly oblong sepals, shorter filaments, and smaller achenes than are found in the Mandon collection from Bolivia. Nothing is mentioned in Weddell's description to indicate the size of the flower, but both the photograph of the supposed type specimen and a specimen of the type collection exhibit the larger flowers. Complications arise with an examination of Peruvian material referred to *R. Mandonianus*. In *Macbride & Featherstone 2474* the stamens are 5-6 in number and the petals have the narrow shape of those of the Bolivian plant, but in *Macbride 3355* the stamens are about 10 and the petals resemble the obovate-rounded type of typical *R. limoselloides* of Venezuela and Colombia.

Such modifications and variations indicate that the Venezuelan and Colombian plants are closely related and not distinct specifically from the Bolivian entity, the latter, therefore, more logically treated as a variety. The plant Turczaninow described precedes by at least three years that which Weddell published*, and, therefore, has priority.

*An apparent discrepancy would seem to exist between the date of Weddell's publication and that of Mandon's collection, for the date appearing in the second volume of Weddell's work is given as 1857, whereas the Mandon collection examined is dated "1859-Jan., 1860". Evidently, the publication of the last part of this second volume (p. 299 is near the end of the volume) was deferred until 1861 (as is suggested by a reference to this work in the Catalogue of the Library of the Arnold Arboretum of Harvard University, vol. 1, p. 737).

Although Benoist (Bull. Soc. Bot. Fr. 87: 125. 1940) described *R. Mandonianus* forma *minor* from Ecuador, based upon a plant characterized by the following description "*A speciminibus typicis differt statura et foliis minoribus.* Le limbe des feuilles est long de 5-12 mm. et large de 2-4,5 mm", it appears to represent only a small-leaved and short-stemmed form of *R. limoselloides*. Although Benoist states in the data accompanying his collection label, "fleurs blanches tres petites" (Ibid.), he does not indicate how small the flowers are in comparison with those of *R. Mandonianus*, but rather gives the smaller stature of the plant and leaves as the only distinguishing characters used. Since the Venezuelan plants do not correspond in small leaf size to that described by Benoist, and further differ in the characters mentioned, they cannot be considered identical. Therefore, it becomes necessary to make the combination, **Ranunculus limoselloides**, forma **minor** (Benoist) Steyermark, comb. nov.

R. Mandonianus f. *minor* Benoist, Bull. Soc. Bot. Fr. 87: 124. 1940.

In view of the more detailed gross morphological data now at hand for *R. limoselloides*, a description is here emended:

Sepala late ovata obtusa glabra 3-5 mm. longa, 2-3 mm. lata; petalis obovato-spatulatis rotundatis unguiculatis, basi squamula instructis, 3-4 mm. longis, 1.5-2.5 mm. latis, quam sepalis brevioribus; staminibus 8-10, nonnihil inaequalibus; filamentis 0.8-1.6 mm. longis, 0.3 mm. latis; antheris oblongis, 0.8-1 mm. longis; achaeniis (maturis) 1.6-1.8 mm. longis, laevibus (Fig. 42, g-h-i).

As for *R. limoselloides* var. *Mandonianus* an emended description for that entity, based upon an examination of isotypic material and a photograph of the type specimen, follows:

Sepala late oblonga, rotundata, 7 mm. longa, 5 mm. lata; petalis oblongo-spatulatis, rotundatis, 5.5 mm. longis, 1.5 mm. latis, quam sepalis brevioribus; staminibus 15; filamentis 4.5 mm. longis; antheris suborbicularibus, 0.8 mm. longis, 0.8 mm. latis; achaeniis (maturis) 2-2.2 mm. longis, laevibus.

Ranunculus nubigenus H.B.K., forma **subintegrus** Steyermark, f. nov.

A typo differt foliis latioribus suborbicularibus, basi cordatis vel rotundatis, obscure crenatis vel integris, 0.5-2 cm. longis, 0.5-1.5 cm. latis, glabris vel paullo pubescentibus; petiolis glabris vel adpresso-pubescentibus, 1.5-5.5 cm. longis; pedunculis glabris vel adpresso-pubescentibus, ad 5 cm. longis; sepalis obovoideo-oblongis, apice paullo emarginatis, 3.5-3.8 mm. longis, 2-2.5 mm. latis; petalis obovatis rotundatis unguiculatis 3-5 mm. longis, ad 2 mm. latis; staminibus 5-8, filamentis 1-1.5 mm. longis; antheris oblongis, 0.9 mm. longis; achaeniis ovoideis, 1.8 mm. longis.

Type in herb. Chi. Nat. Hist. Mus., collected on rocky slopes

along stream above Laguna Mucubají towards Laguna Negra, above Los Apartaderos, state of Merída, alt. 3625-3655 m., July 21, 1944, *Julian A. Steyermark 57481.*

Also referred to this form are the following Colombian collections: moist gully, bushy lower mountain slope, San Cristobal, Bogotá, Dept. of Cundinamarca, alt. 2700-2800 m., September 30, 1917, *F. W. Pennell 2326*; hierba reptante, acuático semisumergida, verde clara, pétalos amarillos, cabeceras del río Otún, bajando del Nevado de Santa Isabel, páramos de la Laguna del Mosquito, Cordillera Central, Dept. Caldas, alt. 3820 m., November 26, 1946, *Cuatrecasas 23250.*

Typical *R. nubigenus* H.B.K. was described (ex DC. Syst. 1: 253. 1818) as having leaves "suborbiculatis 7-dentatis", scapes "apice pubescente" and later (Nov. Gen. 5: 42. 1821) as having stems "superne puberuli" and petioles "pubescente", while in the latter publication the leaves are described as "5-7-crenata". Various collections from Ecuador, Colombia, and Venezuela have the appressed pubescence, especially on the petioles, base of the stems, sheaths, and upper part of the peduncles, characteristic of typical *R. nubigenus.* The leaves may vary in shape from suborbicular to ovate, and from shallowly to prominently 5-9-crenate.

In forma *subintegrus* the blades of the leaves are often much larger and only obscurely crenulate to subentire. The appressed pubescence in this form, while sometimes present, is frequently lacking so that the plant is almost glabrous.

MAGNOLIACEAE

Magnolia ptaritepuiana Steyermark, sp. nov.

Arbor 10-13 m. alta; cortice albicanti vel pallido-cinereo; foliis coriaceis vel chartaceo-coriaceis, subtus dense cinereo-tomentosis, 13-19 cm. longis, 9-15 cm. latis, late ovalis vel suborbicularibus, basi obtusis, apice rotundatis, nervis lateralibus 8-10-jugis adscendentibus; petiolis 1.2-1.7 cm. longis, in diametro 2-3.5 m., glabris vel interdum novellis apice et parte superiori costae villosis; stipulis undique glabris, marginibus ciliatis, 9 cm. longis, 7 mm. latis, subcoriaceis; floribus odoratis; sepalis 3, oblanceolato-oblongis, cuneatis, apice obtusis vel rotundatis, 4-4.5 cm. longis, 2 cm. latis; petalis 6, albidis, arcuato-adscendentibus, oblanceolatis, cuneatis, apice subacutis vel obtusis, 4.2 cm. longis, 1.5-2 cm. latis; gynaeceo e carpidiis glabris, stylis apice recurvatis.

Type in herb. Chi. Nat. Hist. Mus., collected on densely forested steep south-facing slopes overlying sandstone, between "Cave Rock" and base of high sandstone bluffs, Ptari-tepuí, state of Bolívar. alt. 2100-2285 m., October 30, 1944, *Julian A. Steyermark 59547* (2 sheets), "tree 30-40 feet tall with whitish or pale gray bark; leaves: coriaceous-chartaceous, deep green above, gray-scurfy below, paler green below; petals white, arched-ascending; flowers fragrant".

Magnolia roraimae Steyermark, sp. nov.

Arbor 13 m. alta; foliis coriaceis vel chartaceo-coriaceis supra nitidis eleganter tenuiter reticulato-venosis, subtus pallido-flavido-viridibus molliter flavido-villosis, 15-20 cm. longis, 12-17 cm. latis, late suborbicularibus vel suborbiculari-obovatis, basi obtusis, apice rotundatis, nervis lateralibus 9-11-jugis adscendentibus prope marginem 1-2 cm. arcuato-conjungentibus; petiolis 2.7-3 cm. longis, 5-6 mm. latis, undique dense villosis; stipulis intus glabris, extus dense pannoso-villosis, 7.3 cm. longis, 12 mm. latis, subcoriaceis; alabastro ovoideo 4 cm. longo, in diametro 2.7 cm.; floribus odoratis; sepalis 3, late oblongo-obovatis, cuneatis, infra medium angustatis, apice rotundatis, 5 cm. longis, 2 cm. latis; petalis 6, luteo-albidis, cucullatis, subcoriaceis, oblongo-obovatis, cuneatis, apice rotundatis, 4-4.7 cm. longis, 2 cm. latis; gynaeceo e carpidiis glabris, stylis apice recurvatis.

Type in herb. Chi. Nat. Hist. Mus., collected on southwest-facing forested slopes between Rondón Camp and base of sandstone bluffs, Mount Roraima, state of Bolívar, alt. 2155 m., September 30, 1944, *Julian A. Steyermark 59000* (3 sheets), "tree 40 feet tall; leaves coriaceous-chartaceous, deep green and shining above, buff green below; petals creamy white, infolded, subcoriaceous, fragrant; pistils creamy white; rare; one tree seen".

Local name: "iura-tá-na-ca-tá" (Spanish: cabeza de aurauata).

The pubescent buds of this species are reminiscent of the cultivated X *M. Soulangeana*, and of certain North American species.

This species and the preceding one, because of the free stipules, are placed in the genus *Magnolia*, rather than *Talauma*. Specimens of *Talauma* from South America all show an elongate scar on the upper surface of the petiole to which the stipule has been adnate. Both *Magnolia roraimae* and *M. ptaripetuiana* differ from all South American species of *Talauma* in the broadly obovate to suborbicular-obovate leaves rounded above, which are densely villous on the lower surface, and in similar characters from all the known species of *Magnolia* from Central America. In pubescence these two new species somewhat approach *M. grandiflora* L., but that has much smaller leaves and larger flowers.

Magnolia roraimae differs from *M. ptaritepuiana* in several respects: the outer surface of the stipules is densely velvety-pubescent, the petioles are densely villous and stouter, the sepals and petals are larger, the upper part of the branches are densely villous, the pubescence of the lower surface of the leaves consists of much longer hairs, and the areolar network of the upper leaf surface is more prominent and the upper ends of the lateral nerves more conspicuously ananastomosing.

WINTERACEAE

Drimys brasiliensis Miers, var. **ptaritepuiensis** Steyermark, var. nov.

A var. *roraimensis* differt inflorescentia 3-5-floris, pedunculis brevioribus 8-23 mm. longis; staminibus 31-35; filamentis 1.5-1.75 mm. longis; carpellis 8-9, stigmate sessili subterminalique.

Type in herb. Chi. Nat. Hist. Mus., collected on densely forested steep south-facing slopes overlying sandstone, between "Cave Rock" and base of high sandstone bluffs, Ptari-tepuí, state of Bolívar, alt. 2100-2285 m., October 30, 1944, *Julian A. Steyermark 59537*, "small tree 20-30 feet tall; trunk slender; leaves subcoriaceous-chartaceous, deep green above, silvery blue-white below; petals white; peduncles salmon-rose; flower very fragrant".

This variety differs from var. *roraimensis* A. C. Smith principally in the usually 3-flowered inflorescence with shorter peduncles, those in var. *roraimensis* averaging longer. The connective at the tip of the anther is apiculate and densely glandular as in var. *roraimensis*.

MONIMIACEAE

Mollinedia ptariensis Steyermark, sp. nov.

Frutex, ramis subteretibus, novellis puberulis, adultis glabrescentibus; foliis oppositis petiolatis ovatis vel elliptico-ovatis, basi obtusis vel subacutis, apice acutis vel subacuminatis, integris vel subintegris, coriaceis, 10-14 cm. longis, 5-6.5 cm. latis, supra glabris nervis subimpressis inconspicuis, subtus minute adpresso-pubescentibus, nervis circiter 5 jugis prominentibus suboppositis vel alternatis; petiolis 12-15 mm. longis, novellis dense adpresso-puberulis, adultis parce puberulis vel glabratis; floribus masculis: 3-5 mm. longis, in diametro 5 mm.; receptaculo crasso, intus glabro; pedicellis 4-5 mm. longis dense adpresso-pubescentibus; perigonii phyllis 4, extus dense adpresso-pubescentibus, 2 exterioribus late suborbiculari-ovatis, apice obtusis vel rotundatis, 4.5 mm. longis, 3.5-4 mm. latis quam 2 interioribus latioribus, 2 interioribus late oblongis, apice obtusis, 3 mm. longis, 2.5-3 mm. latis, appendice crassa inaequaliter denticulata instructis; staminibus 13-14; antheris suborbicularibus, 1-1.5 mm. longis, 1.25-1.5 mm. latis; filamentis glabris, 1 mm. longis; floribus foemineis solitariis: 6 mm. diam., extrinsecus adpresso-pubescentibus; receptaculo crasso cupuliformi, intus dense hispidulo, paullo aspero; pedicellis 10 mm. longis, dense adpresso-pubescentibus; perigonii phyllis 2 exterioribus suborbicularibus, apice rotundatis, 2 mm. longis, 2.8-3 mm. latis quam 2 interioribus latioribus, 2 interioribus 1.5 mm. longis, 2 mm. latis; ovariis 20, dense adpresso-hispidulis, 2-2.5 mm. longis; stylo glabro, 0.5-1 mm. longo.

Type in herb. Chi. Nat. Hist. Mus., collected on steep wooded slopes just below dry ridge and shrubby growth of southeast-facing

slopes, Ptari-tepuí, state of Bolívar, alt. 1585-1600 m., November 10-11, 1944, *Julian A. Steyermark 60014* (2 sheets, staminate and pistillate), "shrub 10 feet tall; leaves coriaceous, dull green above, pale green below; perianth dull yellow".

In the staminate flowers the 2 inner divisions of the perianth are thickened within, and have more or less three irregularly toothed and denticulate-thickened callosities running lengthwise along the inner margins and irregularly denticulate at the apex. The appendages of the inner divisions of the staminate flowers are thinner than the rest of the perianth but not conspicuously elongated.

This species is apparently a member of Sect. *Appendiculatae* Perk. and is related to *M. Lowtheriana* Perk. of Brazil. From that species it may be distinguished by the 20 densely hispidulous carpels, the rounded tips of the pistillate perianth divisions, larger pistillate flowers, 13-14 stamens, more coriaceous broader subentire leaf blades which are minutely appressed-pubescent on the lower surface, and longer petioles.

Mollinedia roraimensis Steyermark, sp. nov.

Frutex, ramis subteretibus, novellis fulvo-tomentosis; foliis oppositis petiolatis ovatis vel elliptico-ovatis, basi subacutis, apice abrupte acuminatis, remote denticulatis, coriaceis, 15-18 cm. longis, 6-9 cm. latis, supra glabris, subtus subtomentosis, nervis 5-6 jugis; petiolis 12-15 mm. longis, plus minusve subtomentellis; floribus non visis.

Type in herb. Chi. Nat. Hist. Mus., collected on southwest-facing forested slopes of Mount Roraima, between Rondón Camp and base of sandstone bluffs, state of Bolívar, alt. 2040-2255 m., September 30, 1944, *Julian A. Steyermark 59004*, "shrub 8 feet tall; leaves coriaceous, dark green above, pale green and velvety below; stems purple-brown pubescent".

Although this plant was found in only sterile condition, it apparently represents an undescribed species that may be distinguished from the closely related and above described *M. ptariensis* by the denticulate leaves, which are more densely pubescent on the lower surface with longer trichomes.

Siparuna Pittieri Steyermark, sp. nov.

Frutex dioecus, 3 m. altus; ramis tomentulosis, pilis stellatis luteo-fulvis; foliis elliptico-obovatis, 15-32 cm. longis, 7-13 cm. latis, apice subito acutis vel acuminatis, basi rotundatis vel obtusis, minute et remote denticulatis, utrinque stellato-tomentosis; petiolis 1.5-6 cm. longis, dense fulvo-tomentosis; inflorescentia tomentulosa, gracili, foeminea 1.5-2 cm. longa; receptaculo foemineo globoso-urceolato fulvo-tomentoso in diametro 3.5; stylis 4 exsertis, inferne in columnam coalitis.

Type in herb. Chi. Nat. Hist. Mus., collected in Parque Nacional, between Rancho Grande and Maracay, state of Aragua, alt. 240-455 m., December 9, 1943, *Julian A. Steyermark 54967.*

Apparently there belong here two other collections from the same or nearby area: *Killip 37120* from the same locality, and *Pittier 8804* (in guaremales, Urama, between Puerto Cabello and San Felipe, state of Carabobo, 1920.

The *Pittier 8804* collection was cited by Knuth in his Initia Florae Venezuelensis (Beihefte Report. Sp. Nov. **43**: 335. 1927) as the type of a new species, *S. Pittieri* R. Knuth "in schedis herb. Pittier". Unfortunately, that name as such can be treated only as a *nomen nudum.* Since the plant of the Parque Nacional collected by Killip and the writer constitute an undescribed species, previously erroneously referred to *S. gesnerioides* (H.B.K.) A. DC., it is fitting that Dr. Pittier's name be preserved by a validly published description, instead of lapsing into obscurity as a *nomen nudum.* Although I have not seen the *Pittier 8804* collection, it is most probable that it is conspecific with the plant here described. This new species from the Parque Nacional superficially resembles *S. gesnerioides*, but differs in having 4 styles in the pistillate flower and shorter and less abundant tomentum of stems and petioles.

CRUCIFERAE

Cardamine ovata Benth., forma **Lehmanii** (Hieronymus) Steyermark, comb. nov.

Cardamine ovata subsp. *Lehmannii* (Hieronymus) O. E. Schulz, in Engl. Jahrb. **27**: 412. 1903; *C. Alberti* O. E. Schulz, Notiz. **10**: 341. 1928.

This entity, with leaflets averaging smaller than those of typical *C. ovata*, appears to be only an ecological form prevalent on the páramos and higher elevations scattered throughout the range of the species. It varies in glabrity of stems and leaves.

Steyermark 55754 from the state of Mérida (between Los Corales and Las Cuadras) is practically glabrate, while *Lehmann 4759* from Colombia (Páramo de Guanácas), and *Steyermark 55450* from Venezuela (between Buenos Aires and Páramo de las Rosas, state of Lara) are more pubescent.

Some specimens, such as *Steyermark 62743*, from the state of Sucre in eastern Venezuela (forest along stream at base of Cerro de Diablo [western extension of southern peak of Cerro Turumiquire]) are intermediate in leaf size between typical *C. ovata* and f. *Lehmannii.*

An examination of isotypic material of *C. Alberti* O. E. Schulz at once identifies it with *C. ovata* f. *Lehmannii.* The obtuse crenately toothed, rather small leaflets which are sparsely pilose, together with

the scattered pubescence of the sepals, pedicels, and stems can be matched by some of the collections cited above.

CAPPARIDACEAE

Capparis guaguaensis Steyermark, sp. nov.

Arbor 19-25-metralis; ramulis subteretibus glabris, cortice cinereo-brunneo; foliis alternis simplicibus integerrimis, firme membranaceis, longe petiolatis, petiolis glabris 2-11.5 cm. longis; laminis late ovatis vel elliptico-ovatis, 9-26 cm. longis, 5-13 cm. latis, apice acutis vel breviter acuminatis, supra glabris atroviridibus, nervis lateralibus 8-9-jugis prominulis pallidis, subtus glabris argenteo-viridibus, costa elevata, nervis venisque prominentibus; floribus non visis; pedicellis fructiferis glabris 2-2.2 cm. longis, 2-3 mm. crassis; bacco pallide flavido pendulo ovoideo molli, 5-6 cm. longo, 3-4 cm. lato, pericarpio laevi, in sicco ca. 2 mm. crasso; pulpa esculenta dulci cinereo-alba; seminibus circa 6, nigrescentibus nitidis, 15-20 mm. longis, 10-12 mm. latis, testa firmiter crustacea.

Type in herb. Chi. Nat. Hist. Mus., collected along Río Guagua, tributary to Río Manzanares, above valley of Cumanacoa, above Cuchivano, state of Sucre, alt. 230-300 m., May 18, 1945, *Julian A. Steyermark 62800* (2 sheets), "tree 60-80 feet tall; leaves firmly membranaceous, deep dark green above, silvery green below; fruit edible, pendent, ovoid, 5-6 cm. long, 3-4 cm. broad, pale yellow, soft; pulp edible, sweetish, gray white; seeds blackish, shining".

Local name: "toco".

The name "toco" in Venezuela is usually applied to *Crataeva Tapia* L. (C. gynandra L.), but in parts of the Venezuelan Oriente, such as northeast of Bergantín in the state of Anzoátegui, the name is applied, at least in part, to another tree, *Capparis Baducca* L., of the same family. A collection of *C. Baducca* (*Steyermark 61088*) from Cerro La Danta, in this region, was so named by the inhabitants. Near the type locality along the Río Guagua another collection of *C. Baducca* (*Steyermark 62788*) was made.

This new species is striking in that the fruit somewhat resembles that of a *Crataeva*, but the leaves are simple throughout and resemble those of *Capparis Baducca*. At first, it might be wondered whether the fruit and the leaves might not have been collected from separate trees, and therefore comprise a mixture, but such is not the case. The leaves of this collection are much broader and of a thinner texture than those of *C. Baducca*, and the fruit is ovoid and large similar to that of a *Crataeva*. However, it differs from other fruiting specimens of *Crataeva Tapia* sensu latu in its much larger, smooth seeds, much shorter gynophore, and much thinner and softer mature pericarp of 2-3 mm. thickness, whereas that of *Crataeva* is much firmer, more rigid, and has a thickness of 5-7 mm. The pulp of the new species is

sweetish and edible, a fact which has not been recorded for either *Crataeva Tapia* sensu latu or for *Capparis Baducca*.

Steriphoma paradoxum f. venezuelanum (Briquet) Steyermark, comb.nov.

Steriphoma venezuelanum Briq. in Ann. Conserv. et Jard. Bot. Genève **XVII**: 394. 1914.

Although Briquet compares his species with *S. elliptica* Spreng., actually it is related to *S. paradoxum*, of which it can be considered only a form separated from the species by the elliptic or oblong-elliptic leaf blades, which are relatively broader in proportion to their length (2-2 1/2 times broader than long) than in typical *S. paradoxum*, in which the leaf blades are much more elongated, lanceolate, or oblong-lanceolate and usually 4-5 times longer than broad. The blades of *S. paradoxum* f. *venezuelanum* are slightly more obtuse at the base and more abruptly acuminate with somewhat shorter tips than those of typical *S. paradoxum*. The petioles are also somewhat shorter in f. *venezuelanum*.

Apparently there are only two valid species of this genus thus far known in Venezuela, *S. ellipticum* Spreng. and *S. paradoxum* (Jacq.) Endl. In the Catalogo de la Flora Venezolana **1**: 321. 1945, Pittier et al list four species of this genus as occurring within Venezuela. A comparison of the description of *Steriphoma cleomoides* based on *Stephania cleomoides* Willd. from the region of Caracas, and study of herbarium material from that area, show that it is not different from *Steriphoma paradoxum*, based on *Capparis paradoxa* Jacq. from the same region. As the latter validly published name is the oldest one congeneric with *Steriphoma*, it must be used over any others subsequently placed in that genus.

The synonymy is as follows:

Steriphoma paradoxum (Jacq.) Endl. in Flora **XV**: 396. 1832. *Capparis paradoxa* Jacq. Pl. Har. Hort. Schoenbr. **1**: 58. *pl.* 111. 1797.
Stephania cleomoides Willd. Sp. Pl. **II**: 239. 1799.
Steriphoma cleomoides Spreng. Syst. **IV**: 139. 1827.

SARRACENIACEAE

Heliamphora heterodoxa Steyermark, sp. nov.

Folia radicalia, plerumque 12-25 cm. (ad 40 cm.) longa; amphoris in medio expansis, intus dense strigosis pilis albis reflexis, appendice apicali cucullata suborbiculari, 0.6-2.5 cm. longa; scapo 3-7 dm. alto plerumque 2-4-(ad 7-) floris, omnino glabro; bracteis sessilibus amplexicaulibus, late ovatis obtusis vel cuspidato-acuminatis, infimis 3.5-7 cm. longis, 1.6-4.2 cm. latis, superioribus minoribus reductis, supremis 0.9-2 cm. longis, plerumque glabris vel partim puberulis; floribus nutantibus; perianthii segmentis anguste vel late ovatis vel oblongo-ellipticis acutis vel subobtusis in anthesi 20-50 mm. longis, 10-20 mm. latis, in fructu ad 80 mm. longis et 37 mm.

latis glabris; antheris anguste oblongis, 5.5-8 mm. longis; ovario pubescenti pallido viridi; capsulis ovoideis, 1.5-2 cm. longis; seminibus alatis, late ovatis vel suborbicularibus pallido brunneis, 3-3.5 mm. longis, ala ca. 1 mm. lata.

Type in herb. Chi. Nat. Hist. Mus., collected in *Bonnetia roraimae* forest on southwest-facing shoulder, Ptari-tepuí, state of Bolívar, alt. 2000-2200 m., November 2, 1944, *Julian A. Steyermark 59766* (2 sheets), "matted on mossy exposed top of big shoulder; flowers faintly fragrant, arising near base of plant; 2 outer sepals rose-pink at base, otherwise greenish-white; a midline of pink or rose on outer sepals; 2 inner sepals white within; rachis wine red as is scape; leaf pale green with suffusion of wine purple-red, either one color massed or in splotches; leaf tip with incurved purple-red appendage".

Additional collections are: in swamp on open level portion of plateau on southeast-facing slopes, Ptari-tepuí, alt. 1600 m., November 1, 1944, *Steyermark 59651*; vicinity of "Misia Kathy Camp", on mesa between Ptari-tepuí and Sororopán-tepuí, alt. 1615 m., November 15-17, 1944, *Steyermark 60242*; and along moist base of east-facing high sandstone bluffs, Ptari-tepuí, alt. 2410-2450 m., November 7, 1944, *Steyermark 59934*.

It may be noted that considerable variation occurs within this species. For example, *Steyermark 60242* has the pedicels slightly puberulous on one side and glabrous on the other, whereas in the other collections cited the pedicels are glabrous throughout. Moreover, the size of the sepals varies in length and width, depending in part on their age or development. The bracts subtending the pedicels may be obtuse, but usually have a short or elongated cuspidate apex. The appendages of the lids also vary in size, as do the pitchers themselves. The *Steyermark 59934* collection is a good example of how robust this species may become under certain favorable growing conditions induced by a combination of abundant moisture and shade. In every way it is larger and more luxuriant than the other collections cited. It was found on moist bluffs where seepage occurred, growing in mats of *Sphagnum oxyphyllum* moss. It has larger more elongated pitchers with longer hairs within, longer peduncles with larger and more numerous flowers, and larger sepals. Despite these differences it cannot be considered more than a vigorous individual likely to be found in any group of plants where moisture affects more vigorous growth and enlarged parts. In details of morphological characters this luxuriant specimen, in all respects, is identical with that of typical *H. heterodoxa*.

In the living condition *H. heterodoxa* is a very striking and colorful plant. The pitchers are usually pale green with a suffusion of wine-purple-red color, either the one color massed or occurring in splotches, or the lower part of the pitchers may be purple-red with the upper portion pale green. The inner surface may be pale green within, but also may have a dark brown-purple coloring within in the cup portion

at the base, while the margin and keel of the pitchers on the outside are red. The lid appendage is red or purple-red. The flowering stalks arise at the base of the plant, the scapes and flowering pedicels being dark red or wine red. The outer sepals vary from pale green or greenish-white with rose-pink at the base to a rosy color in age; there may be a midline of pink or rose color on the outer sepals. The inner sepals are usually white within, or may be whitish-pink on both sides. They are usually paler green in age. The pubescent ovary is generally pale green in color.

It is interesting to record another new species in this genus to the five previously known. From a genus originally considered as monotypic, six species are at present known, three (*H. Macdonaldae*, *H. Tatei*, and *H. Tyleri*) known only from Mount Duida, and each of the others (*H. nutans*, *H. minor*, and *H. heterodoxa*) known only respectively from Mount Roraima, Mount Auyán-tepuí, and Mount Ptari-tepuí. Undoubtedly, several more will eventually be discovered when all of the tepuis have been carefully explored. *Heliamphora heterodoxa* is most closely related to *H. nutans* Benth. of Mount Roraima and to *H. minor* Gleason of Mount Auyán-tepuí. It differs from them in having longer anthers (5.5-8 mm. instead of 3-4 mm. long) and in the extent of pubescence of the upper pubescent zone on the inside of the upper pubescent zone on the inside of the pitcher, the zone of pubescence in *H. heterodoxa* occupying the upper half of the pitcher, whereas in *H. minor* and *H. nutans* this zone covers the upper one-third.

A key to the species at present known is here given:

Pitchers expanded in the middle and constricted above and below the middle; pedicels slender, drooping

Anthers 5.5-8 mm. long; upper pubescent zone on inside covering about the upper half of the pitcher .....*H. heterodoxa.*

Anthers 3-4 mm. long; upper pubescent zone on inside covering the upper one-third of the pitcher

Pedicels pubescent; sepals 2-3.2 cm. long; pitchers scarcely expanded in middle; wings of pitchers more or less equally broad from base to apex; lid appendage abruptly narrowed at base, suborbicular; pitcher 10-12 cm. long. *H. minor.*

Pedicels glabrous; sepals 3.5-5 cm. long; pitchers conspicuously expanded at middle into a flared bell-like form; wings of pitchers abruptly narrowed below the middle and again appearing above the middle; lip appendage inconspicuous and passing directly into the upper part of the pitcher, or conspicuous and suborbicular to orbicular with abrupt constriction at base or not all at constricted; pitcher 13-30 cm. long. .....*H. nutans.*

Pitchers barely or not at all expanded in the middle, with an elongated tubular form; pedicels stout, erect

Pitchers glabrous within, except for a few scattered hairs at the very margin; sepals obtuse .....*H. Macdonaldae.*
Pitchers pubescent within; sepals acuminate

Lid cuspidate at the summit; pedicels very sparsely pubescent *H. Tatei.*
Lid rounded at the summit; pedicels densely pubescent *H. Tyleri.*

Having had an opportunity of observing in the field four of these six entities, and having witnessed the great variability within *H. heterodoxa* of Ptari-tepuí, especially in regard to the size of the pitcher and the shape and size of the appendage on the lid, it may be stated that observations on the other species of *Heliamphora* have revealed a great amount of variation in shape and size (length and breadth) of the lid and appendage of the pitcher, and in shape and size (length and breadth) of the sepals. For example, in *H. Macdonaldae* of Mount Duida, there is variation in sepal width, the sepals in the type (*Tate 1022*) being about 40 mm. wide, but Gleason notes (Bull. Torr. Bot. Club 58: 367. 1931) that in *Tate 1023* "The perianth segments.....are much narrower, ranging from 14 to 23 mm." Although they are described by Gleason as being "obtuse", they actually vary from obtuse to subacute.

Furthermore, when more material is available for study, it is quite possible that *H. Tyleri* may have to be reduced to a variety of *H. Tatei*, and *H. minor* to a variety of *H. nutans*. The differences of pubescence of pedicel and smaller size of sepals separating *H. minor* from *H. nutans* have been found to be variable and inconstant characters. Similarly in *H. Tatei* the tip of the lid is slightly cuspidate, while in *H. Tyleri* it is rounded. Moreover, the characters of pubescence in *H. Tatei* and *H. Tyleri* are relative and the same variations in shape of lids and pubescence of pedicels is found in these two species from Mount Duida as are found in the material of *H. heterodoxa* from Ptari-tepuí.

In his work on carnivorous plants (p. 11), F. E. Lloyd states, for *H. minor* of Mount Auyán-tepuí, that "the bell is densely hairy only along the marginal zone, with a few scattered hairs on the general surface". But while this is true for older pitchers, it does not hold true for young to middle mature ones which are densely hairy with fine short hairs throughout the upper one-third of the bell. The hairs either appear to fall off or weather off eventually, thus causing a deception of observation on this character.

With more extensive collecting of this genus over a wide area, more variations will probably be found eventually within given species than are at present known to occur. It is quite probable, therefore, that some of the species may have to be reduced to varieties or forms.

Publication 667

UNIVERSITY OF ILLINOIS-URBANA
580.5FB C001
FIELDIANA, BOTANY$CHICAGO
28:1-2 1951-52
3 0112 009379089